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Attention may be directed to the new numbering of the Volumes and issues of "The South African Mining Journal." The issue of September 21st, 1912, was numbered Volume X., Part II., No. 498 and the succeeding issue, that of September 28th, 1912, Volume XXII., Part I., No. 1096.

The explanation is simple. The "South African Mining Journal" was founded in 1891. Publication was resumed after the war in 1903, under the title of "The South African Mines Commerce and Industries," in which was incorporated "The South African Mining Journal." In 1908 the paper reverted to its original title, but hitherto the numbering has dated from March, 1903. The Journal has just celebrated its Twenty-First anniversary, so that the issue of September 28th, 1912, obviously cannot be Volume X. and Number 499.

The proper numerical title is Volume XXII., No. 1096, and the correction thus instituted removes a discrepancy which must have been patent to all our readers.

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Notes and News.

An Epoch-making Invention.

Considerable interest has during the past few weeks been evinced in a new invention which it is claimed would revolutionise engineering. Unfortunately the inventor has not been able to upset the established laws of thermodynamics, and engineering must be reconciled for some further period to advance along the old lines. We understand that the claims of the inventor have been withdrawn. Some of our prominent engineers are now rather sorry that they took a tolerant view of the innovation.

* * * *

"A Long-felt Want."

During the past fortnight some interesting tests have been carried out by Mr. F. A. D. H. Moseley, with a Gardner gas engine at the Show Ground, on a new anthracite coal discovered at Delmas on property in which Messrs. H. A. Rogers, W. P. Taylor, and W. Beachy Head are understood to be interested. Although the results of the tests are not yet available, it is likely that they will go to show the great suitability of the coal for gas-producer purposes.

* * * *

A New Explosive.

We have received a copy of the prospectus of Bawden's Improved Explosive, Ltd. The share capital is £60,000 of which the vendor gets £40,000 in shares, and £1,000 in cash, working capital £15,000, and £4,000 is held in reserve. Sixteen thousand shares are offered for subscription, 10s. on application and 10s. on allotment. The company is formed to take over from the inventor, Mr. F. W. Bawden, C.E., all his rights to his explosive known as Bawden's Improved Explosive. It is proposed to manufacture and sell the explosive in any or all of the following countries, viz., Great Britain, Australia, and the Union of South Africa. Letters Patent have been granted in Rhodesia, and the vendors rights there have been acquired by a company there, and a factory has been erected and is working. It is claimed that the cost of producing this explosive is considerably less than that of any other in use on the Rand, and has many advantages over other explosives. The secretary is Mr. Henry F. Head, 9, Bussey Chambers, Commissioner Street, Johannesburg.

* * * *

Nigel's Reduced Profits.

The manager of the Nigel G.M. estimates the profits for this year at £4,000 monthly. The reasons given are: (1) Reduced value of accumulated slimes; (2) increased cost of native labour; (3) reduced number of stoping faces, owing to a reduction in the tonnage of ore reserves. With a better labour supply, however, it is possible that these figures may be improved upon. The returns from this company's mine for the month of February are as follows:—Gold, fine ounces, 4,469; profit, £4,274; stamps working, 75; value of gold, £18,983; tons milled, 12,000.

* * * *

Main Drives off the Reef.

Main drives off the Reef are, it appears, coming into increased favour on the Witwatersrand. A few weeks ago we referred to the policy pursued in this regard at the Modder B Mines, and more recently we observed a similar method of mining in the Turf Mines Section of the Village Deep. A similar scheme is being followed at the West Rand Mines in certain of the more broken sections of that property. A main level is driven without regard to the sinuosities and dislocations of the conglomerate beds, and the Reef is tapped from this drift at frequent intervals by box holes. This method of working is, of course, particularly effective where much broken ground is encountered.

Benoni.

It is gratifying to learn that although no slimes were treated at the Benoni plant during the month of January, in accordance with the policy of the board to put through as much ore as possible, there was no loss incurred on the month's operations. The grade, also, is said to have improved, so that altogether matters look more promising. With regard to rumours that were afloat to the effect that the mine would probably be closed down at no distant date, we learn that no step of that sort is under consideration.

* * * *

Rand Mines, Ltd. Quarterly Report.

The directors of Rand Mines, Ltd., have issued their quarterly report for the three months ended December 31, 1911. As already announced, the meeting to be held in Johannesburg on March 27 will be purely formal, as the chairman will move the adjournment of the proceedings until June 5. The directors add: "The proposal to adjourn the meeting is with the object of giving European shareholders an opportunity of perusing and considering the annual report and accounts before deciding how their proxies shall be used. It must, however, be noted that, under the company's articles of association, no proxy is available for an adjourned meeting which was not available for the meeting originally convened: and if shareholders wish to be represented at the meeting, it is necessary that the proxies already sent to them should reach the London office, No. 1, London Wall Buildings, E.C., on or before March 1, 1912. It is anticipated that the report and accounts will be in the hands of European shareholders by about April 6. This will give ample time for any shareholder to give his proxy-holder any instructions he may desire as to the recording of his vote."

* * * *

Estate Duty.

One of the latest Bills published is that "to consolidate and amend the laws in force relating to the payment of duty on the estates of deceased persons." It provides that duties shall be levied in respect of the estate of every person who dies on or after the 1st of April, 1912 (called estate duty), which shall be payable on the nett value of that estate; a duty (called settled estate duty), which shall be payable upon the ascertained duty of any such limited interest; and a duty (called fixed duty) which shall be payable on the value of any stock held by a person who, having died on or after the first day of April, 1912, was domiciled or resident outside the Union at the date of his death. The schedules do not set out the amount of the imposed duties.

* * * *

The Diamond Outlook.

According to latest advices, the diamond market remains in a satisfactory condition, and there is no slackening of the demand for raw goods. It is distinctly encouraging to learn that the Diamond Syndicate has again "sold out." There is no doubt in the minds of the best judges that, given good assortments, the market will improve still further and assume bigger dimensions during the month of March. Although it may appear rather a bold statement to make, matters have worked so well hitherto that, from reports to hand, experts profess their ability now to forecast the course of business for practically the whole year. If reports are correct that the producers will only supply the demand, and not force big quantities on the market, the year should prove eminently satisfactory for producers and cutters alike. As far as Antwerp is concerned, the failures that have taken place in that quarter have completely cleared the position, and business there is now running smoothly. Shareholders in the Premier (Transvaal) Diamond Mines will be glad to learn that the production for the month of December has been all disposed of at satisfactory prices. Stocks in the hands of dealers, whether of rough or cut, are very small, and everyone seems most anxious to buy. According to advices, some very good business has again taken place in the Argentine, where the condition of the crops is supposed to be favourable. If expectations in this quarter should be realised, a large quantity of diamonds will in future find their way to this, comparatively speaking, new and promising market.

Sir George Farrar Explains.

During the week Sir George Farrar stated that he had received a cable on Saturday last, addressed to him personally, from *The Times*, London, asking him "What explanation delay announcing accident?" Sir George inquired into the matter, and replied on Saturday that "When the turbine broke down on the 22nd of January it was unnecessary to make any announcement, as there was ample reserve power in the station. Trouble in the reserve power station, however, arose on the 28th February, necessitating starting up stand-by steam plants at two mills. The announcement was made on the 28th of February immediately it was known that there would be a shortage of tonnage. It was hoped, however, that the profit for February would improve on January."

* * * *

Chamber of Mines Executive.

At the annual meeting of the Chamer of Mines last week, on the motion of Mr. Schumacher who spoke of the good work Mr. Hamilton had done two years before, seconded by Mr. H. O'K. Webber, Mr. J. G. Hamilton was elected president for the year. Messrs. J. Munro and Max Elkan were elected vice-presidents, and a hearty vote of thanks was accorded the retiring president. The following executive committee was appointed:—Messrs. H. C. Boyd, S. C. Black, D. Christopherson, W. Dalrymple, W. H. Dawe, J. W. S. Langerman, P. Ross-Frames, J. G. Hamilton, G. W. Higgins, Julius Jeppe, M. G. Elkan, J. Munro, Geo. Nathan, E. A. Wallers, C. W. Villiers, and H. O'K. Webber.

* * * *

The Geological Commission.

The latest report of the Geological Commission of the Cape Province has just come to hand. It recounts the work of the Commission during the year 1910. Good steady progress is recorded, and what the Chairman (Mr. Merriman) describes as facts of scientific and possibly economic importance were brought to light. Regarding prospective steps to obviate the divergence of the conditions under which the geological surveys of the different parts of the Union have hitherto been carried on, Mr. Merriman, in forwarding the report to the Secretary for the Interior (which, by the way, was done in May, 1911), expressed the hope that due recognition would be given to the services of Dr. Rogers and Mr. du Toit.

* * * *

Improving Returns Geduld.

Recent returns of the Geduld Proprietary Co. have evidenced distinct improvement in the productive affairs of this company. Geduld has had a chequered career, and there are still no doubt difficulties to be overcome, but it seems that the mine has at last turned the corner, and that larger profits may be anticipated in the future. During 1910 Geduld earned a profit of £18,279 from 127,510 tons milled, the rate being 2s. 10d. per ton. In that period working costs averaged 20s. 7d. per ton, and the revenue 23s. 5d. Last year 138,860 tons were put through the battery, which consists of 50 stamps and 2 tube mills, and a profit of £35,973, or 5s. 2d. per ton, resulted. The revenue per ton averaged 26s. 8d., and expenses 21s. 6d. In January last the profit per ton came to 5s. 10d., or £3,927 in the aggregate, 13,360 tons being milled for a recovery of £17,787, equivalent to 26s. 7d. per ton. It maybe recalled that the capital of the company was increased in August, 1911, to £1,000,000 in order to provide funds for enlargement of plant, and we understand that an extension of equipment is now receiving the attention of the directors. A feature of this property is that in the lowest levels the reef lies to all intents and purposes horizontally.

* * * *

To Lay the Dust.

Representatives of three manufacturers of rock drills were before the Royal Commission on Mines on Wednesday in mail week, with a view to the elucidation of the dust problem in mines due to drilling. Mr. Leonard Holman, of the firm Holman Brothers, Limited, Camborne, was of the opinion that water can be applied effectively so as to avoid the danger of the respiration of dust at no great expense. His firm were the manufacturers of the James water blast, which had proved to be effective in clearing the atmosphere in ten minutes. He maintained that dust in actual drilling operations could be avoided, but that after the face had been blasted the dust created remained in suspension as long as seventy minutes unless means were taken to improve matters. For drilling purposes he preferred the jet to the spray. Mr. Geo. Rayner, of the Hardy Patent Pick Company, was of the opinion that the jet was preferable to the spray, but he thought it would be a great hardship on mine-owners to prohibit the spray. Mr. W. C. Stephens, of the firm of R. Stephens and Son, was of the opinion that the drill of the future was more likely to take the form of the reciprocating type. Mr. Stephens considered the only effective way of killing the dust was by water through the drill. If he were asked to vote for either the jet or spray, he said, he should vote for the total abolition of the spray.

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G.S.W.A. Diamond Production.

The Government authorities of German South-West Africa estimate that the revenue from the diamond industry will amount to £500,000 in the Budget year of 1912. This amount is mainly composed of the export duties, and to a smaller extent of the mine taxes. According to the "Berliner Tageblatt," the estimates for this year are of special interest, as it had been reckoned that the export duties would be reduced or converted, but the Budget again provides for the imposition of duties of 33 1-3 per cent., which may be assumed as a proof that a decisive alteration in the duties cannot be counted on for the time being. Having regard to the fact that a number of diamond fields will be worked out this year, and the northern fields cannot be certainly expected to yield production, the Government authorities estimate the output of diamonds at 850,000 carats for this year, as compared with an estimate of 900,000 carats for 1911.

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Dr. Hatch on Witwatersrand Geology.

In an article on the conglomerates of the Witwatersrand, which he has contributed to a recent work on "Types of Ore Deposits," published by the *Mining and Scientific Press*, San Francisco, Dr. Hatch says that the following stages can be established with some degree of certainty:—(1) The classification and sedimentation of the coarse and fine material derived by denudation from the land surfaces of the ancient Swaziland formation. (2) The consolidation, under a growing cover of fresh sediments, of the loosely aggregated pebbles and sand beds to conglomerates and quartzites by cementation with silica (quartz). (3) The burying to a great depth of the earlier sediments under later accumulations. The development of chloritoid from argillaceous material in the sediment probably took place during this period. (4) (a) The elevation of the beds accompanied by folding and fracturing. (b) The filling of the fractures thus formed by the injection of igneous material, the process being accompanied and followed by pyritization, the deposition of carbon, and the precipitation of gold from the warm magmatic waters given off during the solidification of the igneous intrusions. The development of sericite, probably at the expense of some allogenic felspathic constituent of the banket and the replacement of the pyroxene of the earliest basic dykes by chlorite, were no doubt due to the influence of the compensatory differential movement that accompanied and followed this period of elevation. (5) The metasomatic replacement of both allogenic and authigenic quartz by pyrite and by calcite, as well as of chloritoid by quartz, and the sealing of small fractures by quartz; all these processes being accompanied by a renewed precipitation of gold. (6) The destruction of the pyrite within the zone of weathering by oxidation and consequent liberation of its mechanically included gold, followed by concentration of the latter by secondary enrichment.

TOPICS OF THE WEEK.

WHITE LABOUR AND WAGES.

Organised Labour in the Union Assembly this week has been emulating organised Labour in England by injuring its own best interests. The Labour leader, Mr. Creswell, has been given an opportunity to resurrect and parade all his worn-out platitudes and dreary half-truths, dragged from the limbo where lay the forgotten report of the Creswell Commission. Prompted by his parliamentary experience, on this occasion, his arguments were made to take the form of a new appeal to the farmers' acute labour needs, and an intensified note of sharpness and bitterness was lent to his words by reference to recent untoward events in the industry. In any scheme that promises to relieve their labour necessities, the farmers, naturally, are with Mr. Creswell, and the ranks of his supporters are also strengthened by the adhesion of philosophic reformers like Mr. Duncan, fearful of the future of the white races in South Africa, in the absence of foreign hordes of cheap white labour. The question is, how does Labour reconcile its desire to maintain the present rates of white pay with these appeals to import a large competing army of white workers? With all his appearance of single-minded anxiety for the interests of the white miner, and all his show of criticism-disarming candour, Mr. Creswell carefully avoided this aspect of the question. And it is a vital aspect of the question from the miners' point of view. Mr. Burton, the Minister of Native Affairs, was quick to see this opening in Mr. Creswell's armour. Mr. Burton declared that the Labour leader seemed to think that when he had dealt with the Rand all difficulties had been overcome, but if he came to any other area in South Africa he would find that the hard manual work at every harbour, at all docks; in fact, that the hard work everywhere was performed by the black man. "Supposing," said Mr. Burton, putting his finger on the weak spot in Mr. Creswell's argument, "the motion was agreed to, and everyone employed white labour, on what terms were they going to employ their white labour; on the terms of the ordinary labourer? No, on the terms of the trades unions." The Labour people do not appear to have any consistent answer to Mr. Burton's question. It is noteworthy that at the annual meeting of the Chamber of Mines last week Mr. O'Kelly Webber dwelt on this anomaly. "Curiously enough," he said, "one hears the representatives of the white worker preaching two gospels, which appear to be in conflict with each other. On the one hand one hears the expression of dread of any reduction of the cost of living. I have even heard representatives of this section of the community say that when copper coinage is introduced on the Rand it is time for white men to quit. On the other hand, one hears the same representatives clamouring for the employment, I presume by importation, of white labour in place of the coloured labour now employed here. They always, however, neglect to tell their audiences how they propose to apportion the 12½ millions, which is the wages bill of to-day on the Rand." Thus the whole question boils down to this. Is the industry to struggle to maintain the present scheme of things *i.e.*, cheap unskilled black labour and well-paid white skilled labour, or is it to import white labour and pay all white workers what their parliamentary leaders are pleased to call a "fair wage," which cannot obviously be as good a wage as that now paid? With dividends falling off, and the profit per ton decreasing daily, it is clear that the industry can stand no further increase in the wage bill. Mr. Creswell's proposals, therefore, mean, if they mean anything, that miners should submit to an all-round reduction in wages in order that more white men may find employment. The industry, perhaps, can afford to treat the issue with indifference. Can the miners? We warn them that if and when their wages are reduced that their numbers may be increased, they may expect to find little consolation or sympathy from any one—least of all from the self-constituted leaders who are now engaged in glibly prejudicing their interests.

THE S.A. SCHOOL OF MINES.

The Calendar of the South African School of Mines and Technology for 1912 reflects the increasing usefulness of that institution. It contains, as usual, a great deal of valuable information regarding the educational facilities offered by the School. Some particulars of the mining courses and terms may be quoted to show the scope and thoroughness of the work done. The courses leading to mining and engineering diplomas consist in the case of mining and metallurgical students of two terms of work at the College per session, each of approximately seventeen weeks' duration. These last from mid-March to mid-November. In addition, there is a term of two months' practical work on a mine preceding the first term of each year, which second, third and fourth year students must attend. In the case of engineering students what is known as the "Sandwich" system is followed after the end of the second year's course. The Association of Mine Managers has given its approval to this scheme, and helps to place students on mines for the term of practical work. The scheme also has the approval of the Administration of the South African Railways and other employers. In addition there are classes specially intended for those who are occupied during the greater part of their time in earning a livelihood. They are of two kinds, the ordinary evening classes which are held in the School of Mines and Technology Buildings, Plein Square, near Park Station, Johannesburg, and Reef classes, which are held at Johannesburg, and at different centres along the Rand. The authorities of the School of Mines have realised for some time that if the need for technical education along the Rand is to be adequately met it will be necessary to carry on classes at other centres in addition to Johannesburg. This can only be done at some disadvantage, as the School, with its well-equipped laboratories and lecture-rooms, is undoubtedly a most important factor in teaching; but partly on account of distance, and partly on account of the awkwardness of shifts, it is clearly necessary that an effort should be made to carry the opportunity of, at any rate, elementary technical education to those who find it impossible to come to Johannesburg. The Association of Mine Managers has taken a keen interest in this work, and it has represented to the authorities of the School that something more should be done at certain centres than has hitherto been attempted. The Association itself gives certain prizes every year to be competed for by apprentices and by students attending the mining classes. As things have been in the past, the competition has practically been limited to those living within easy reach of Johannesburg, whereas it is desirable that all should have an opportunity of competing for these prizes, even though it would eventually be impossible to make their chances equal, irrespective of locality. There are other evening class prizes and scholarships attached to the School which it is desired to throw open to competition amongst a much larger number of students than those who can attend the School. The authorities of the School dwell on the fact that whilst lectures on technical subjects are undoubtedly valuable, it is necessary, before a man can fully appreciate them, that he should have some instruction in mathematics and elementary science. There is naturally a strong temptation for a man to proceed to the subject of which he already has a considerable knowledge, and to limit himself to that subject, with the notion of immediate practical benefit, but this can only lead to a narrow and superficial training. The necessity for the study of preliminary and collateral subjects cannot be too strongly emphasised if a man's outlook is to be broadened and his progress in knowledge is to be real and continuous. The object aimed at is education in its broadest sense, and not a mere gathering together of ill-digested information. All this goes to show that the courses arranged for day, evening, and Reef students bear evidence of careful study of the peculiar conditions and needs of the Rand, and of a genuine anxiety to utilize the resources and facilities of the School to the greatest possible benefit of the community.

THE CHARTERED REPORT.

The receipt of the annual report of the Chartered Company synchronises with the announcement that General Botha is to visit Rhodesia this year as the guest of the company. Whatever may be the object of this visit, it is evident from the Chartered report that the Premier will find in the territory healthy signs of all-round growth and expansion. Certainly the report which the directors of the British South Africa Co. have just issued for the year ending March 31, 1911, is the best they have, as yet, been able to present. The year ended with a credit balance of £170,610. The improvement has been especially marked in the mining and railway progress which the report records. The European population has increased more than 87 per cent. since the census of September, 1904. The land sales during the past year have increased by 330,000 acres, the imports by £570,000, and the net increase of the Rhodesia and Mashonaland railways for 1911 was £254,000. The gold output was a record, viz., £2,647,896. The administration of Southern Rhodesia is now established "on a permanent, normal and satisfactory basis." For the ordinary purposes of government, the expenditure has been fully met by administrative revenue which also covers a substantial annual expenditure upon public works. The revenue and oversea imports for 1910 increased approximately 25 per cent., and this rate still continues. A census shows the population to have nearly doubled. The native health is improving, the object of the company being to give the native "a sound mind and a sound body." Salisbury is up to date with a 4½ per cent. loan of £100,000, which was fully subscribed, and, at Bulawayo, buildings to the value of £170,000 have been erected since the end of 1910. Forty-eight million acres are still available for settlement in Southern Rhodesia, and 1,582 farms are already surveyed and ready for occupation. The new farmer settlers are now 759 as compared with 487 in the previous year, and the estimated capital these have introduced is £274,800. Tobacco, ranching, dairy produce, and the like are making headway, and a bacon factory has been established at Bulawayo. The company is working on its own account about 150,000 acres, one object being to train settlers. Northern Rhodesia is now administered as one territory, but expenditure is not yet covered by receipts. Revenue is growing and yielded during the year £97,474. The directors declare themselves satisfied with their policy of commercial development. Railway interests have been consolidated and extended, and the diversified nature of the receipts in the commercial department is well shown by the balance sheet. The directors are doing all they can to make Rhodesia attractive to the settler, and have established a land bank, with a capital of £200,000, which the company has subscribed. The mining industry has steadily expanded. The tendency is for individual workers to sell their property when they can to companies who work on a larger and more energetic scale. During the present year, Mr. Ackermann says that bigger reduction plants will be put up and that a larger gold output may be expected in the year 1913. Discoveries of tin have been made, though it is too early to speak of market sales. Of silver, there have been produced 187,640 ozs.; of coal, 212,529 tons; and of chrome iron, 52,363 tons. Complaint is made of the shortage and irregularity of the native labour supply, and steps have been taken to improve it. The railway position continues to be satisfactory. The gross receipts of the Rhodesia, Mashonaland and Beira railways were £1,736,570, as compared with £1,356,289 in 1910. There is an increase of traffic in every branch. For the railway year which ended on September 30, there were the following increases:—Passenger traffic, £50,147; goods, £351,714; minerals, £46,442. The difficulty is not the absence of traffic, but how effectively to deal with that which is offered. With this end in view, great extensions are being made, and improvements introduced. The company has acquired 1,131,888 shares of the Railway Trust, Ltd., thus increasing its already extensive railway interests. These figures eloquently reflect the progress that has been made in every direction. Though some shareholders may be disappointed that no dividend has been declared, none can find fault with the appreciation of the assets in the year.

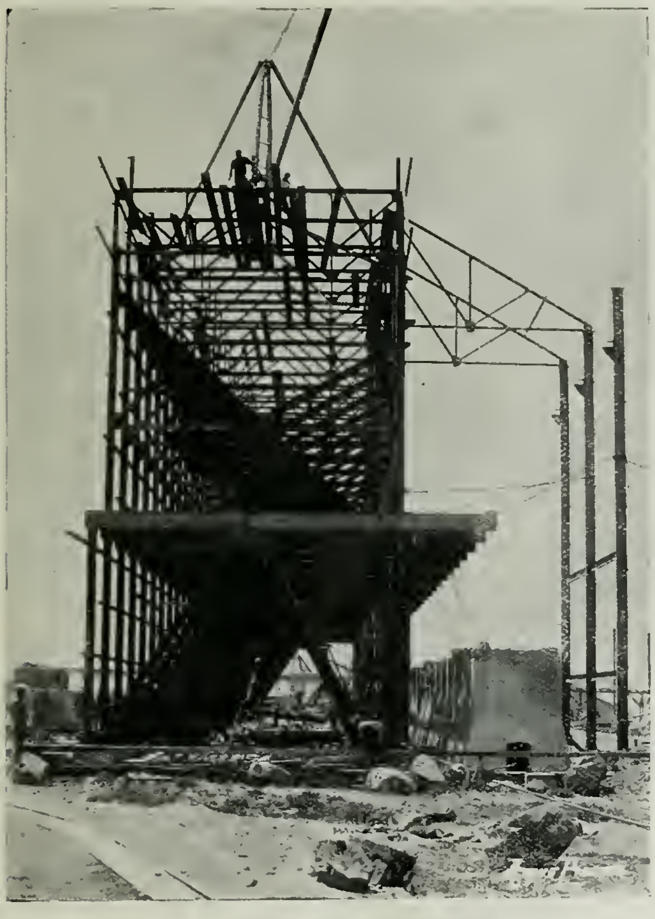
CONSOLIDATED LANGLAAGTE.

The New Reduction Works Progressing Well—Promising Developments in the Deep Level Section—Important Financial Arrangements.

The progress made in the construction of the new recovery plant at the Consolidated Langlaagte mines, which has now become a prominent object upon the skyline as seen from the railway, standing about a stone's-throw from the abrupt bend in the Main Reef road just beyond Langlaagte, directs attention to the progress made by the company during the past year.

The Year's Profits.

The working profits for the year ended 31st December, 1911, totalled £83,337 8s. 1d., as against £82,482 9s. 9d. recorded during the period 1910, and it is gratifying to note that for the last six months of 1911 the monthly profits were well over £8,000 per month. Some 275,463 tons were milled in 1910, with a recovery of 25s. 11d., and at a working cost of 19s. 8d., leaving a profit of 6s. 3d. per ton milled. During the following year, 1911, tons milled amounted to 251,537, the average value being 24s. 10d., the working cost 18s. 1d., and working profit 6s. 9d. per ton milled. The working costs for the quarter ended March 31st last averaged 18·866s., and those for the quarter ended December 31st 16·909s. per ton milled, and from these figures it is easy to discern why, with a smaller tonnage milled and a lower grade, it was possible to obtain higher profits.

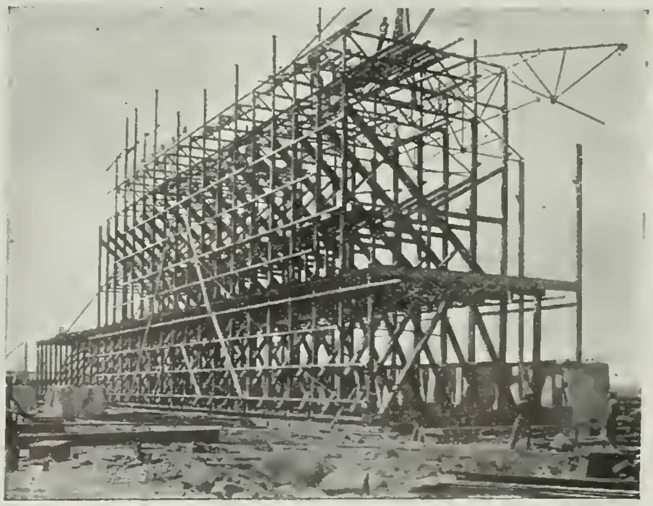


End View of Steel Ore Bin Construction and Mortar Box Foundations.

Ore Reserves.

In view of the fact that the stopes in the old mine to the north of the great dyke have shown diminished values, as was pointed out at the last annual meeting, and that a new 100-stamp mill with accompanying cyanide plant is now well under way, it becomes important to consider the matter of ore reserves. The ore remaining in the old mine was estimated last year at 401,317 tons, worth, on a recovery basis, about 6·37 dwts. per ton. Developments from the two new shafts in the area south of the dyke have shown considerably better values to the extent of two or three pennyweights. The east, or sub-Crœsus shaft, at the end of December last, had been sunk to a total depth of 1,947 feet, or 252 feet below the 6th level station. The West, or sub-Star shaft, had, at the same date, reached a total depth of 2,179 feet, or 246 feet below the 7th level station. The ore developed amounted to 1,384,504 tons, classified as, payable, 930,512 tons of an average assay value of 8·77 dwts., and unpayable 453,992 tons of an average assay value of 2·43 dwts. This cannot be regarded as other than satisfactory. The old mine will continue to supply ore for another five years or so, and the grade of rock sent to the mill will, in consequence, be slightly less, no doubt, than that just quoted. The capacity of the new plant will be about 540,000 tons per annum, as against, say, 270,000 tons at the existing mill, or, roughly, double the present crushing. On the basis of last year's recovery and cost only the yearly profit should be in the neighbourhood of £200,000.

The financial statement to be presented at the next annual meeting, in June next, should be of unusual interest in view of the heavy capital expenditure which is now being incurred in connection with the new mill and with the development and equipment of the mine to the south of the dyke. Capital expenditure on the development and equipment of this deep level section during 1911 amounted to nearly £225,000. By an agreement with the Johannesburg Consolidated Investment Company, Ltd., the company was entitled to borrow from the former up to the extent of £250,000 for the purposes of the new work in hand. Borrowing on this agreement had already commenced at the end of 1910 up to nearly £60,000, and, obviously, some important financing must have taken place during the past year in order to supplement the loan referred to. As the chairman, Mr. J. Munro, remarked at the last annual meeting:—"It would be apparent that more money would be required than the £250,000 which they had arranged to receive as a loan from the Consolidated Investment Company, and in a scheme of this nature they had to prove to shareholders on the other side of the water that they had a valuable property." The development results obtained in

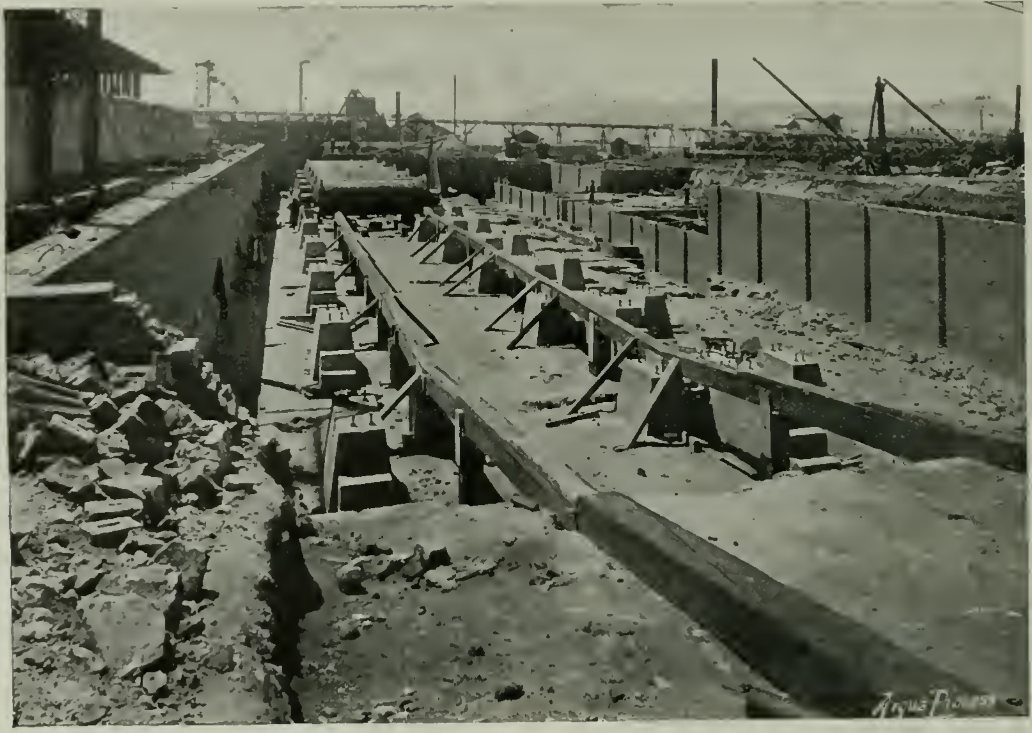


View of Construction Work from the North-West.

the deep level section should go far to provide this assurance, and under the circumstances it is to be expected that fresh funds have been arranged for on satisfactory terms. With regard to the former loan, it will be remembered that there is an option at par over 12,868 reserve shares, and 204,453 shares to be created, until the 6th November, 1913. The Debenture issue of £250,000, having been reduced at the beginning of 1910 by £125,000, now stands at a similar amount.

THE NEW MILL.

The construction work at the new 100-stamp mill has reached an interesting stage. The steel framework of the building itself and of the ore bins is all in place, and the house is now being covered in. The concrete mortar box foundations remind one somewhat of those at the Randfontein Central mill, except that they are in separate blocks for each ten stamps. A low tunnel runs through the base of each to facilitate the reaching of the holding-down bolts. The timber king-posts are in readiness for erection, and the completion of the main structural arrangements of the battery should be effected at an early date. The ten tube mills are in place, and appear to be a solid efficient type of machinery. A steel trestle support for the conveyor belt to the mill ore-bins is erected, and the crushing and sorting station and sands collectors are in progress. As pointed out by us several months ago, there will be nothing of an experimental or tentative nature in the reduction works, only well tried and thoroughly proved metallurgical methods of treatment which are suitable to the conditions of the property being provided for in the best way, and upon an adequate scale. The accompanying photographs show the steel structure of the new mill ore-bins, the concrete mortar box foundations, and the tube-mill pit. It will be gathered from the previous remarks that the plant has advanced much further than appears in the illustrations, but the latter represent details which are not apparent in photographs taken more recently. The tube-mills, it may be mentioned, are 16 ft. 6 in. long by 6 ft. in diameter, and are made by Messrs. John Cochrane and Co., Glasgow.



TUBE MILL PIT. EAST DEEP LEVEL SHAFT IN BACKGROUND.

Zaaiplaats Tin.

During February Zaaiplaats results were as follows:—Mill ran 28·5 days; tons ore crushed, 2,679; duty per stamp per 24 hours, 6·266 tons; average yield concentrates, 5·151 per cent.; concentrates won, 138 tons; estimated average value concentrates, 68 per cent. tin; total development, risen, driven, and sunk, 318ft. 0in.; tons ore mined, 2,710; estimated cost, not including realisation charges, £2,900. Native labour is plentiful.

Brakpan Mines.

The following information with respect to the February output and the reserve gold account is furnished by the Secretary:—Stamps working, 110; running time, 26 days; ore crushed, 42,177 tons; tube mills working, 6; ore hoisted, 49,023 tons; ore from dump, 1,572; waste sorted, 15 per cent.; fine gold declared, 14,445 ozs.; value declared, £60,721; equal to 28s. 9d. per ton milled; working costs, £37,498, equal to 17s. 9d. per ton milled; working profit £23,223, equal to 11s. per ton milled; gold in reserve, 2,800 fine ozs.

Durban Roodepoort G.M.

The directors of the Durban Roodepoort Gold Mining Company have declared an interim dividend of 10 per cent. (2s. per share), payable on and after March 30.

City and Suburban.

The following are the results of the operations of the City and Suburban Company for February:—Tons crushed 26,112; gold declared, 11,459 fine ounces; profit, £19,226; gold reserve at February 29, 6,330 fine ounces.

New Kleinfontein.

The returns for February are:—Stamps run, 220; tons milled, 37,650; fine ounces output declared, 12,493; value, less cost of realisation, £52,331; working costs, £38,132; working costs per ton, £1 0s. 3d.; profit declared, £14,199; capital expenditure, £13,481. The increase in costs per ton and decreased profit are due principally to the short month and to the large number of raw natives engaged in anticipation of a gradual increase in the milling capacity.

KUILS RIVER REDIVIVUS.

Another Flotation Proposed—A Good Property with a Bad Record—Brief Historical Review.

The announcement that there has been issued the prospectus of a company entitled the "Alluvial Tin Fields of Africa," with a capital of £100,000 in £1 shares, of which £50,000 shares at par are to be issued for the purpose of acquiring the property of the Kuils River Tin Mines, revives the memory of what has been one of the most unfortunately managed properties in South Africa. The history of the concern, as far as the public is concerned, begins in 1903. In the beginning of that year, or just previously, alluvial tin was found in some creeks on the farm Langverwacht, on the side of a low range of hills which is easily visible out Stellenbosch way, from the Capetown Docks. As showing the vast knowledge of economic geology possessed by the people of the Peninsula it may be mentioned that prospecting operations for petroleum were in progress in the granite of Langverwacht when the discovery of cassiterite was accidentally made. The owners of the option being under the necessity of meeting heavy payments in respect of their contract, engaged an engineer to report upon the property. His report was immediately published in a prospectus which was issued, and subsequent operations over a considerable period proved its accuracy. Applications for shares came in abundantly from the Rand and elsewhere, and the flotation of the venture was a matter of certainty, when, for some unexplained reason, the directors withdrew the prospectus and proceeded to finance the undertaking themselves. Some small plant was erected, and ore was treated on a small scale for some time, during which period the option holders were periodically negotiating with possible purchasers. These negotiations came to nothing, until Mr. Edmund Brayshaw came upon the scene, and eventually took over and floated the concern with a prodigious share capital and a comparatively insignificant amount of cash working resources. More elaborate sluicing plant was erected under the direction of Mr. Harry Griffiths as consulting engineer, a slime plant and rotary washing gear were installed, and every effort was made to produce profits upon an adequate scale. A large quantity of tin concentrates were produced—Mr. Griffiths estimates the yield at about 50 tons to the acre—but whether any profits worth talking about were ever secured is doubtful.

MUCH SACK AND LITTLE BREAD.

The exiguous amount of cash was soon exhausted, and the company ceased to operate, such work as continued to be done being carried out by an ex-employe of the company, who was allowed to take the ground on tribute. He was reported to have been making an excellent thing out of it, but we are unaware how long his period of tributing lasted. Latterly, some prospecting work has been done on the lodes which exist in the property, and which in the original report and subsequently were declared to be of a particularly promising kind.

MR. DOUGLAS OSBORNE'S OPINION.

The chief feature of the property, however, was its large accumulation of tin bearing alluvial gravel, and Mr. Douglas Osborne, who visited the ground a few months ago, is said to have considered it the best deposit he had seen in South Africa. A large quantity of untouched gravel of good value must still remain, although the Kuils River Tin Mines, Ltd., doubtless got as much of the cream of it as they could conveniently manage during their period of operations. Mr. Osborne, as we announced some time back, was in treaty with the company for a transfer of their assets, and the flotation now contemplated is probably due to his efforts. History is not definite upon the question of the advantages that accrued to the original option holders under the chairmanship of Mr. Trill, of Capetown, in consequence of the flotation under the Brayshaw auspices, but rumour has it that they practically came out, in the long run, without as much as the proverbial bean. They have only themselves to blame, for the original prospectus was drawn up on a fair basis, and they had their fortune in their own hands.

Elandslaagte Collieries, Ltd.—Annual Meeting.

The eleventh annual meeting of the Elandslaagte Collieries, Ltd., was held last week, at Pietermaritzburg. Mr. A. H. Rennie, the chairman, presided. In presenting the audited accounts for the past year, the directors, while regretting that the result is not more favourable, consider that, having in view the low prices still prevailing for coal, together with increased expense in securing labour, and additional burdens placed on the industry by Government, they may congratulate shareholders. Owing to additions made to rolling stock, etc., and the efficient condition in which the entire plant has been kept, it has not been felt necessary to write off the depreciation so large an amount as during the previous year. After making, however, due allowance for this, and all liabilities, the net profit was £7,391 6s. 6d.: add to this the amount brought forward, £2,809 18s. 4d.; total, £10,201 4s. 10d.; against which has to be placed the amount voted the directors at last general meeting, £750. dividend of 2½ per cent. paid 17th March. 1911, £4,125, dividend of 2½ per cent. paid November 10, 1911, £4,125; leaving £1,201 4s. 10d. The directors recommend that after voting the remuneration to the directors provided for by the Articles of Association, and reserving a sufficient sum to meet the tax on mine profits, the balance should be carried forward. The demand for bunker coal during the first month of this year was limited, but a better inquiry has set in, and there appears every likelihood of this being maintained.

Crown Mines, Ltd.

The annual general meeting of the Crown Mines, Ltd., which was to have been held on Wednesday, was adjourned till May 23, in terms of a circular issued to shareholders in January. There were 976,312 shares represented out of an issue of 1,880,000. The purpose of adjournment is to give shareholders time to consider the reports and accounts.

Nourse Mines.

The directors of the Nourse Mines report for the quarter ended January 31 that 5,951 feet were driven, sunk, and risen, exclusive of stopes, the reef disclosures being:—Main Reef, 834 feet; width, 25 inches; assay value, 12·3 dwts. Main Reef Leader, 1,144 feet; width, 13 inches; assay value, 18·6 dwts. South Reef, 1,057 feet; width, 18 inches; assay value, 21 dwts.; 145,100 tons were milled, yielding 52,709 ozs., or 7·26 dwts. per ton, valued at £221,287, or 30s. 6d. per ton. Working costs were £167,949, or 23s. 2d. per ton; and working profit was £53,338, or 7s. 4d. per ton. Profit from accumulations and sundry revenue raised the net profit to £55,869. The Government tax on profits was estimated to amount to £4,999 for the quarter. At January 31 the company had 347 ozs. in reserve. The capital expenditure for the quarter amounted to £13,068, exclusive of the proportion of an annuity of £1,632 payable to the Government in respect of mining rights acquired under an area of 21·9 claims.

THE TIN FIELDS.

A Long Awaited Flotation—Further Activity Contemplated at Appingendam—Reported Rich Find at Roodepoort.

The impending flotation of Leeuwpoort, albeit to be carried out privately, and the approaching completion of the new Rooiberg mill, should put more life into the Rooiberg district, which has been somewhat languishing of late, as far as public interest in its progress is concerned. The Leeuwpoort mine appears to be turning out excellently well, and bids fair to outshine even the Rooiberg mine which as a tin mining proposition compares well with any in the world. The various groups of the Rand are interested in the flotation, and there is little doubt that when productive operations are inaugurated they will be continued upon a sufficiently adequate scale. A thirty-stamp battery is said to have been ordered, and since the company will have the experience of other Transvaal tin mines to guide them in the matter of dressing plant, it may be expected that the whole will be as up-to-date and well planned as it is possible to make it. The parties interested in Leeuwpoort are Sir Abe Bailey, the African Farms, Rhenoster Mines, Witwatersrand Township, the Neumann Group, the Transvaal Consolidated Lands, and the Anglo-French Exploration Company. Prospecting work is being continued on the two Vellefontein areas with satisfactory results, and further activity in the neighbourhood will doubtless follow upon the entry of Messrs. Friedlander and Co. into the adjacent tin country. There is probably no other tin-bearing ground in the world of equal extent which has such promising prospects as the area covered by the Rooiberg quartzites, and it speaks volumes for the kind of enterprise shown in districts outside the Rand that, although tin has been known to exist in payable quantities there any time during the last six or seven years at least, while tin has stood at high average figures over the whole period, there is only to be found a rattle-trap mill of ten stamps, which is making excellent profits in spite of itself.

POTGIETERSRUST DISTRICT.

Little news comes from Roodepoort, where the T.C.L. have been sluicing for some time past with the two-fold object of winning alluvial tin ore and of laying bare the granite in which the primary ore deposits are located, but it is reported that at least one ore body of considerable size and richness has been exposed as a result of the hydraulicing work. Doubtless many others of varying dimensions will be found in due course, and the company are to be congratulated upon the success which seems to be attending a rather bold undertaking. Prospecting operations are about to be undertaken upon a block of 100 claims held in the name of W. Dickinson on Appingendam. They adjoin at one end, a block upon which good ore has been found near the surface by the Bay Tree Syndicate, and at the other a well-known piece of ground upon which Trevethen's shafts are sunk. The same syndicate has been working for some time past on a large area of claims lying almost immediately to the north of Graumann's claims on Zaaiplaats. Work has been suspended there, for the moment, until further information is obtainable from the outcrop workings along the edge of the pegmatite horizon on Graumann's block and that of the No. 2 Syndicate.

Benoni Consolidated.

The following are the results for February:—Stamps, 50; days ran, 28; tons milled, 19,009; value to the mill, 6·03 dwts. per ton; gold recovered—mill 3,586 ounces, cyanide 876 ounces, total 4,462 ounces; net value recovered, 4·69 dwts. per ton; total value, £18,624; working expenses, £18,616; profit for the month, £8; working costs per ton—mining 11s. 1·3d., reduction 6s. 9·8d., general 1s. 4d., development (actual cost) 0s. 3.9d., total 19s. 7d.; net capital expenditure, £677. No allowance has been made for development other than actual cost of work done, or for interest on loans.

" Jumpers "-Treasury Results.

The following cable was on the 7th despatched to the London office of this company:—" The following is the result of the joint working of the " Jumpers " and Treasury mines during last month: 85 stamps, working 25 days, crushed 8,650 tons, yielding 2,183 ounces of fine gold from mill; 1,124 ounces of fine gold from tailings by cyanide; 369 ounces of fine gold from current slimes; 153 ounces of fine gold from accumulated slimes; total from all sources, 3,829 ounces of fine gold. Value of output, £16,080. Joint profit for the month, £1,501. Position of joint gold reserve at end of last month, 627 ounces of fine gold."

Rooiberg Minerals Development Co

The following are particulars of the estimated result of operations on this company's property for the month of February, 1912:—Stamps, 10; days run, 28; milled, 1,513 tons (short); concentrates, 61 tons (long): average assay value metallic tin, 68 per cent.; net capital expenditure, £6,268; estimated profit, £3,015; adjustments due to fluctuations in the price of tin to be added to estimated profit in respect of October shipments, £207; gross profit for month, £3,222. The concentrates in reserve at 29th February, 1912, amounted to 20 tons (2,240lbs.) of a net value of £1,895.

New Heriot.

The returns of the New Heriot Gold Mining Company for last month's operations are as follow:—Tons milled, 10,100; ounces recovered, 5,026; profit, £9,152; reserve gold at month-end, 1,022 ounces. The new compressor was started at the end of February, and is running satisfactorily.

Sub Nigel.

The Directors submit the following summary of operations of the company for the quarter ended the 31st December, 1911:—

Mine.—Number of feet driven, sunk and risen, 1,231; ore crushed. 13,039 tons. Mill.—During October, 1911, an average of 30 stamps ran 27 days 7 hours 55 minutes; during November, 1911, an average of 30 stamps ran 28 days 14 hours 53 minutes; during December, 1911, an average of 30 stamps ran 28 days 14 hours 38 minutes. Total running tome, 84 days 13 hours 26 minutes. Tons crushed, 13,039; tons crushed per stamp per 24 hours, average 5.140; yield in fine gold, 2,762.733 ozs.; yield per ton crushed in fine gold, 4.238 dwts. Tube Mill.—Yield in fine gold, 689.817 ozs.; yield per ton crushed in fine gold, 1.058 dwts. Sands Works.—Sands treated equal to 63.99 per cent of tonnage milled), 8,344 tons: yield in fine gold, 1,900.412 ozs.; yield per ton treated in fine gold, 4.555 dwts.; yield per ton crushed in fine gold, 2.915 dwts. Slimes Works.—Slimes treated, 4,695 tons; yield in fine gold, 567,427 ozs.; yield per ton treated in fine gold, 2,417 dwts.; yield per ton crushed in fine gold, 0.870 dwts. Total yield.—Total yield in fine gold from all sources, 5,920.389 ozs.; total yield per ton crushed in fine gold, 9.081 dwts

Working Expenditure and Revenue, for Quarter ended the 31st of December, 1911.—Mining expenses, £9,950 13s. 1d., 5s. 3.155d. (cost per ton crushed); pumping expenses, £1,182 1s 1d., 1s. 9.757d. (cost per ton crushed); sorting, crushing and transport ore, £423 1s. 3d., 7.787d. (cost per ton crushed); milling expenses, £2,022 16s. 8d., 3s. 1.233d. (cost per ton crushed); tube mill expenses, £242 4s 11d., 4.459d. (cost per ton crushed); sands expenses, £1,197 18s., 1s. 10.049d. (cost per ton crushed); slimes expenses, £541 5s. 3d., 9.963d. (cost per ton crushed); general charges, £1,091 19s. 3d., 6s. 3.373d. (cost per ton crushed); development, £2,921 12s. 4d., 4s. 5.776d. (cost per ton crushed); a total amount of £22,576 11s. 10d., £1 14s. 7.552d. (cost per ton crushed); profit on working carried down, £2,216 15s. 4d., 3s. 4.802d. (cost per ton crushed). Revenue, £24,793 7s 2d., £1 18s. 0.354d. (cost per ton crushed) Amount spent on shaft sinking, £24 14s. 4d. During the quarter the sum of £658 14s. 4d. has been spent on exploratory development. At the 31st of December, 1911, there was gold in reserve, 200 ozs.

THE DIAMOND FIELDS.

Developing a Prospect on the Pniel Estate.

Opening a Paddock on the New Prospect, Pniel Estate.

Incline Way to the 116 ft. Level, Pniel Prospect.

Kolmanskop Diamonds.

The output of diamonds from this company's property at Luderitzbucht for the month of February was 10,828 carats.

Koffyfontein Diamonds.

The specification of rough and uncut diamonds registered at the office of the Detached Assistant Magistrate, Koffyfontein, during the month of February, 1912, is as follows:—Carats, 5,420; value, £12,317 9s. 4½d.

Blaauwbosch Diamonds.

The Secretary writes:—"Owing to the heavy rains in the district, and the necessity of hauling reef, 503 loads only were washed during the month of February, producing 195 carats, or 38·76 carats per 100 loads. A further 73¾ carats were recovered in second sortings. The erection of the crusher plant is being pushed on, and during its erection all mine boys will be put on to hauling the reef back to an angle of safety to enable the next levels to be worked."

New Vaal River Diamonds.

At the New Vaal River Diamond and Exploration Company's offices, Sydney, Vaal River Estate, district of Barkly West, 1,489½ carats were registered by 141 diggers for the month of February, 1912, and realised £8,232, which includes stones of 14¾ carats, realising £15 5s. per carat; 12½ carats, £14 3s. 6d. per carat; 15½ carats at £13 4s. 6d. per carat; 13 carats at £12 2s. per carat; 13½, 9¼, and 8¾ carats at £12 per carat; 1·32¾ carat, 1·29½ carat, 1·18 carat, 1·16½ carat, 1·16¼ carat, 1·16 carat, 1·15¾ carat, 2·15 carat, 1·13¾ carat, 1·13¼ carat, 1·12¼ carat, 1·11¾ carat, 1·11½ carat, 1·10½ carat, and 1·10 carat.

THE BASIS OF CALCULATING TONNAGE COSTS.

An Old Subject Revived—Mr. Ross Skinner on the Apportionment of Charges—A Matter for the Chamber of Mines.

In a recent letter to the "Engineering and Mining Journal" Mr. William Hague, of Grass Valley, California, reopens an old subject of discussion by enquiring whether tons milled or tons hoisted should be the basis for calculating the yield and the cost per ton for mining operations, and the editor of that journal, at the end of a long editorial upon the matter says:—"It would be desirable if we could have some standardization respecting this question in accounting, but we fear that the difficulties are prohibitory. Anyway, we hope that Mr. Hague's communication will lead to some further discussion of this subject, which is of perennial interest." That the question is of special interest to us, also, in its various aspects, is to be learnt from the report of the Superintending Engineer of the E.R.P.M., which was presented at the last annual meeting. In explaining the increased cost of working in the latter portion of 1911, he states that it was due to several reasons, among which were (a) an alteration on the basis of calculating tonnages; (b) decrease in tonnage milled from development; (c) revised classification of development work resulting in a greater portion of the expenditure being borne by mining, so that working costs may more accurately reflect the true position. Since these statements are, we may assume, intended for the edification of shareholders, they would have been a great deal better for some accompanying explanation of their actual meaning. The point (b) is, perhaps, well understood, but the other information as it stands, can only serve to increase the mystification of the average person, who is accustomed to plain figures, so to say.

What is Wanted.

This is by the way, however. The fact that emerges from this explanation of Mr. Ross Skinner, with regard to the East Rand Proprietary Mines' working costs, and from the queries of Mr. Wm. Hague, and the "Engineering and Mining Journal" is that the art of calculating working costs has not yet been established upon a proper scientific basis. One would, perhaps, best describe the position by saying that there is a great deal too much art about it for the liking of the shareholder, and not enough organised common-sense to elevate it to the rank of a science.

The Council of the Institution of Mines and Metallurgy did a great deal in the direction of standardizing mine accounts by an analysis of the elements of working cost and capital expenditure, and by the effort to introduce systematic thinking, at least, upon the subject. The variety of methods adopted for presenting accounts by the groups of companies on the Rand, to say nothing of the often faulty ways of making them up (*vide* Mr. Skinner's report, already referred to) suggests the desirability of steps being taken by the Chamber of Mines to bring about such a degree of standardization as has been proposed by the Institution of Mining and Metallurgy, in accordance with the conditions of Rand mining. It would assist in restoring that public confidence which has been the prominent theme at board meetings for some time past.

Profit Per Ton Milled.

With regard to the particular question of Mr. Hague it may be replied that a much better method of assessing the efficiency of any individual management over successive periods would be, not the substitution of the ton mined for the ton milled, as the basis of working cost calculation, but the substitution of the idea of working profit for working cost as a means of comparison. An advance on the common practice would then be the calculation of working profit per ton mined rather than per ton milled, for it would tend to do away with wasteful mining and to foster the practice of clean stoping—the chief objects to be attained in the crusade for "the emancipation of the mine manager."

Cloverfield Mines.

The report of the directors for the year ended 31st December, 1911, submitted at the ninth ordinary general meeting of shareholders yesterday, states, *inter alia*:—The company's property holdings remain unchanged, and consist of 801 mining claims, situated on the farm "Cloverfield," No. 173, Boksburg, equal in area to 799·58 full claims. No work has been done during the year on your property which remains in charge of a caretaker. The buildings and machinery have been kept in good order and repair. The slight reductions in the capital accounts, machinery and plant, and stable equipment, amounting to £45 13s. and £129 0s. 6d. respectively, represent proceeds of sale of machinery and livestock, which were not required. 45 shares in the Witwatersrand Native Labour Association, Ltd., were also disposed of for £75 10s. The general expenditure during the year under review amounted to £5,924 14s. 2d., of which claim licences and interest on loan account for £3,639, against which the sum of £459 10s. was received from sundry revenue. The loan has been increased to £43,653 13s. 3d., which includes interest up to 31st December, 1911. As mentioned in the last annual report, the lenders have accepted an irrevocable power of attorney to pass a bond over the company's property as security for this loan. The company still holds 30,000 reserve shares. To enable European shareholders to receive and consider the annual reports and accounts before issuing their proxies for representation at the annual general meetings, the directors have decided to hold these meetings during the month of May in each year. With this aim in view an extraordinary general meeting of shareholders has been convened for the 25th April to make the necessary alterations in the company's articles of association.

Koffyfontein Estates, Ltd.: Annual Report.

Mr. J. J. Coghlan, Acting Chairman, presided at the annual meeting of the Koffyfontein Estates, Ltd., which was held last week. The report of the directors was as follows:—Your directors have much pleasure in submitting their annual report and the balance sheet, together with the statement of profit and loss account for the past year. Revenue for the year amounts to £14,743 17s. 7d., expenses for the year amount to £3,087 0s. 1d., showing a profit for the year of £11,656 17s. 6d. The following distributions have been made to the shareholders, viz.: Dividend No. 41, 30th June, 1911, 10 per cent.; bonus 10 per cent., £5,680; dividend No. 42, 31st December, 1911, 10 per cent.; bonus, 10 per cent., £5,680; total for the year, 40 per cent., £11,360. In their last annual report your directors referred to the necessity of providing for increased storage accommodation for water to meet the requirements of the mines. This necessity has been emphasised during the year by the taking up of the Ebenezer Mine for the purpose of working same. Machinery is now in the course of erection, and it is confidently anticipated by those interested in this venture that the greatly enhanced values of diamonds now ruling will enable this mine to be worked. The unprecedented drought of the past few months has been a source of considerable anxiety to your directors. Fortunately, we have been able to keep the mine going all through this trying time. In the scheme now under consideration ample provision is being made to prevent a recurrence of this trouble in the future. The policy of your directors for the past few years in curtailing dividends, and thereby increasing the cash reserves of the company, has provided sufficient funds to meet this outlay.

Mines of the Witwatersrand.

XII.—WEST RAND CONSOLIDATED MINES, LTD.

A Huge Concern Awaiting More Labour— Last Year's Profits Slightly Greater than in 1910—The Development Position—Extension of Slimes Plant.

Few, if any, mines on these gold fields have felt the pinch of labour shortage more acutely than the West Rand Consolidated Mines, that great fusion of mining areas lying immediately to the west of the township of Krugersdorp, achieved by the General Mining and Finance Corporation at the beginning of 1907. Here is a property of over 2,000 claims with an outcrop of 2½ miles along the strike. The West Rand Consolidated constitutes, in fact, one of the largest concerns operating on the Witwatersrand, and the development and equipment have been laid out with a view to the treatment of a vastly larger tonnage than is being crushed at present. The proposition is of low grade nature and the margin of profit earned is small. Clearly the success of the company is dependent on being able to operate on a large scale, and if ever the optimistic statements emanating from the chair at annual meetings of this company are to materialise, the company will have to obtain a much larger complement of labour than is at present engaged.

A General View of the Surface Plant, West Rand Consolidated.

A Vast Tonnage Awaiting Treatment.

It is obviously inconsistent with the generally accepted principles of mining economics that a property in which the Main Reef series is contained in 1,908 claims, of which 716 claims are also underlaid by Battery Reef, should be operated on a basis of 100 stamps and 4 tube mills. At the present rate of exhaustion the "life" of the concern must be enormous and even if operating with an equipment four or five times as great as that at present in use the period of productivity would be in excess of the average for Rand mining undertakings. Only by working on a large scale can this company make really adequate returns. The mine has, as already remarked, been laid out with a view to expansion and extension, and on its present cramped basis the company suffers by reason of the large area over which shafts, etc., are distributed, and also because it is at present impossible to push ahead with development to any really marked degree and at the same time earn profits.

A Hammer Boy Mine.

The labour complement of the mine on the present crushing basis may be placed at 3,700 "boys," and there are actually at work about 1,000 short of this number. In consequence of this labour scarcity, about 75 per cent. of the ore sent to the mill is broken by machine drills, whereas to secure really satisfactory results quite 75 per cent. should be broken down by hammer boys. To those who hold the idea that the West Rand Consolidated is a great low grade concern with very large ore bodies this may come as a surprise. It should, however, be realised that the West

Equipment at West Shaft, West Rand Consolidated.

Rand is a much broken and faulted property, especially in the western section. Machines break very well between the faults, but where the ground is much disturbed—and unfortunately a great deal of the West Rand property is so affected—stoping by rock drills is not productive of good mining results. The eastern section of the West Rand Consolidated is a comparatively settled piece of country. There are one or two large dykes, but there appears to be a main direction of dislocation or thrust and the reef is picked up again without much real difficulty, whereas in the western area the underground workings constitute a bewildering network of faults and dislocations. As affording some indication of the broken nature of portions of this West Rand property, it may be remarked that in the western portion of the mine the dip varies from northerly to vertical, and in so far as a southerly inclination is concerned from 30 degrees to flat.

The Mill and Cyanide Plants.

The present reduction and treatment plant of the West Rand Consolidated Mines consists of 100 stamps and 4 tube mills. There are 60 of the old Violet stamps in the battery, 20 medium weight heads and 20 heavy stamps. The duty per head during the last quarter of 1911 was 12·046 tons per day. The slimes plant is now being extended; otherwise there are no additions to equipment in progress at the present day.

Recent Returns.

The following table states the salient features of productive operations for last year as disclosed in the quarterly reports:—

Quarter.	Stamps at work.	Tube Mills at work.	Tons Milled.	Working Revenue.			Working Costs.			Working Profit.		
					Per Ton.			Per Ton.			Per Ton	
				£	s.	d.	£	s.	d.	£	s	d.
March	100	3	66,150	79,262	23	11	69,975	21	2	9,287	2	9
June	100	4	81,940	95,585	23	4	80,782	19	8	14,802	3	7
September	100	4	84,600	92,889	21	11	82,742	19	7	10,146	2	4
December	100	4	86,500	100,111	23	0	83,607	19	3	16,504	3	9

The Shafts.

There are a number of shafts on the property of both outcrop and deep level character. On the Main Reef section there are at outcrop the Nos. 1, 2 and 3 shafts, of which the Nos. 1 and 2 are now working. To the south of these are the west and east shafts. The former is a seven-compartment incline sunk on a dip of 50 degrees to 1,450 feet. The east shaft may be described as a semi-deep; it has been sunk to 1,850 feet, and is in close proximity to the mill and treatment plants. Over both these shafts strong headgears have been built and the general equipment around the pit heads is of a thoroughly efficient and modern type. Particular mention may be made of the electric winders at the west shaft. These two shafts are designed to play a highly important part in the future development of the West Rand Consolidated. Each is designed to handle a large tonnage of ore, and we should imagine that a milling equipment three or four times as large as is at present utilised could easily be fed from these two shafts. The scheme of underground ore transport as between these two new shafts and the shafts at outcrop is briefly as follows:—Rock from the No. 1 shaft section is gravitated down to the east shaft and thence hauled to surface. No. 2 shaft ore is gravitated down to the west shaft station and then hoisted. The crushing and sorting houses at this west shaft are connected by a 24in. locomotive track with the Battery.

The Battery Reef.

In the Battery Reef section—to the south of the Main Reef area—three shafts have been put down: the Violet, the Flora and the Southern or Rand shaft. At present this latter shaft is the only one working. It is a 40 degrees incline of three compartments and is connected up with the mill by a locomotive track. Development is to be pushed on with in this section, and it is hoped that at an early date a large tonnage of Battery ore will have been exploited from this shaft. The Battery Reef, it may be remarked, has been the mainstay of the Lancaster West mine for a number of years.

Development and Ore Reserves.

The development carried out in the West Rand Consolidated property during last year is reflected in the following figures as to footage:—March quarter, 3,351 feet; June quarter 4,160 feet; September quarter, 4,357 feet; December quarter, 3,925 feet. Mine development redemption charges, it may be remarked, figured in the last quarter report at 2s. 6d. per ton. Profitable and fully developed and valued ore reserves at the end of 1910 amounted to 1,124,631 mining tons of an average assay value of 5·54 dwts. per ton over a stoping width of 46in., and at the end of last year they amounted to approximately the same.

From the above it may be calculated that the estimated 1911 working profit was £50,739, from 319,190 tons milled, as compared with £46,555 and 242,000 tons in the preceding year. Profits and tonnage for the first two months of the current year have been as under:—

	Tons Milled.	Working Profit.
January	28,800	£3,572
February	27,300	£2,707

On capital account the following sums were expended during last year:—March, £38,480 11s. 1d.; June, £30,598 13s. 8d.; September, £16,305 10s. 5d.; December, £11,308 1s. 11d.; total, £96,692 17s. 1d.

Finances and General Outlook.

The financial position of the company as disclosed in the balance sheet at the 31st December, 1910, showed that the company had cash at bankers on fixed deposit amounting to £140,000, which amount, we understand, has not been decreased up to date. For that year the profit and loss account showed a working profit of £38,372 3s. 2d.; which, with the inclusion of sundry revenue, amounting to £8,183 2s. 9d., made a gross profit of £46,555 5s. 11d. This added to the credit balance of £20,944 14s. 10d. brought forward from the previous year, gave a total credit of £67,500 0s. 9d., which was dealt with as follows:—Interest on debentures, £18,750; debenture trustees' fees, £400; cost of bearer warrants written off, £750 12s. 2d.; balance, being unappropriated profit, carried forward, £47,599 8s. 7d.; total, £67,500 0s. 9d. Speaking of the company's position at the annual meeting in March last, Sir George Albu remarked: "You possess the essentials for success—a mining area of 2,000 claims with an outcrop of 2½ miles on strike, a mine laid out from the commencement with a view to extensive operations, large ore reserves, a reduction works with a present treatment capacity of over 300,000 tons per annum, which can easily be augmented, surplus funds to the extent of over £300,000 for further extension, and, if I may say so, an energetic administration." It is patent that there are all the makings of a really big concern at the West Rand, a concern which, so far as present development indicates, will always be a low grade affair, but nevertheless one on which fair profits should be earned. It should be borne in mind that the issued capital of this company is £2,001,424, and to earn an adequate dividend on this amount of money will necessitate the stamping of a very much larger tonnage than is at present being done. Despite the broken nature of the mine there is no doubt but that with a sufficiency of labour the several shafts could contribute four or five times as much ore as is at present being sent to surface, and could continue to do this for many years to come. The future of the West Rand Consolidated Mines may therefore be said to be absolutely wrapped up in the solution of the ever-present native labour problem; more so, perhaps, than any other mine on the Witwatersrand.

THE FERREIRA—FERREIRA DEEP AMALGAMATION.

Principal Conditions of Provisional Agreement.

A SPECIAL general meeting of shareholders in the Ferreira and Ferreira Deep, Limited, will be held on Friday, May 10, to consider a certain provisional agreement dated February 12th, 1912, made by and between the Ferreira Deep Company as purchaser and the Ferreira Gold Mining Company Limited, as vendor, for the acquisition by the Ferreira Deep of the undertaking, property and assets (with certain reservations aftermentioned) and the assumption of the liabilities of the Ferreira Gold Mining Company, Limited, as at 1st January, 1912. The following are the principal conditions of the Provisional Agreement:—(1) The Ferreira Gold Mining Company, Limited, shall go into voluntary liquidation after confirmation of the Agreement, and the Ferreira Deep undertakes to defray all expenses of the liquidation, including the liquidators' remuneration, the amount of which shall be fixed by the shareholders in the Ferreira Gold Mining Company, Limited, at their meeting. (2) Various provisions are inserted providing for the upkeep and continued working of the Ferreira Gold Mining Company, Limited's, property, and for the Ferreira Gold Mining Company, Limited, to act as a trustee for the Ferreira Deep up to date of confirmation of the agreement, in case it should be confirmed. (3) The Ferreira Gold Mining Company, Limited, is to retain out of its cash assets sufficient funds (a) To make a cash distribution of 10/- per share to its shareholders, and (b) To purchase 25,000 shares in the Ferreira Deep at a price not exceeding 76s. each. To insure this purchase the Ferreira Gold Mining Company, Limited, has secured the right to acquire, if necessary, such 25,000 shares or any part thereof, from third parties at any time within fourteen days after the amalgamation resolutions have been finally confirmed. The Ferreira Gold Mining Company, Limited, therefore shall not retain more than £95,000 for this purpose. (4) The purchase price of the assets (subject to these reservations) is 70,000 new shares of £1 each fully paid in the Ferreira Deep, to be created for the purpose by the increase of the capital of from £910,000 to £980,000. (5) The 95,000 shares obtained as above are to be distributed among shareholders in the Ferreira Gold Mining Company, Limited, pro rata to their holdings on the basis of one share for one, and a distribution of 10/- per share in cash will also be made to them. (6) The 70,000 new shares in the Ferreira Deep shall rank for any dividend declared by it subsequent to 31st March, 1912, and shall in all other respects rank equally with the existing shares. (7) The purchaser shall pay all expenses of transfer and transfer duty. (8) The Ferreira Deep undertakes to increase the number of its directors from five to six.

CAPE GEOLOGICAL COMMISSION.

Directors' Report for 1910—Latest Coal Discoveries of Small Economic Value. —The Insizwa Copper Nickel Deposits.

IN the course of his report for 1910, issued this week, Mr. A. W. Rogers, the Director of the Cape Geological Commission, writes:—"During the past year field work has been carried on in the divisions of Beaufort West, Fraserburg, Sutherland, Laingsburg, Victoria West, Barkly East, Maclear, Elliott, Mount Fletcher, Mount Ayliff, Engcobo and Qumbu. In November, 1909, on the request of the General Manager of Railways, a survey of the country surrounding the recently-opened coal in the Laingsburg and Sutherland Divisions was begun. The immediate object of the work was to discover the nature of the bodies of coal and to furnish advice as to the prospects and future development of the coal-bearing area. The occurrences at Wilgebosch Kloof and Hartebeestfontein proved to be fresh examples of the type of coal-filled fissures long known to exist in the Beaufort West and Aberdeen Divisions, on which much time and money have been spent in vain since the late seventies of last century. It is certain that the discoveries yet made have at the present time no economic value; and from the apparent absence of coal-seams from the Great Karroo, a country singularly favourable to the discovery of seams if they exist, the chances of the fissure coal being in any way connected with seams of coal are very remote. The fissures filled with coal offer a very interesting problem, but it is more than doubtful whether further investigations will prove of commercial use, at any rate in the near future. I spent seven and a half months between Beaufort West, Loxton and Sutherland, mapping a large area of Beaufort beds and the dolerite intrusive in them. A large part of the country surveyed falls within Sheet 13 of the coloured map, which was commenced by Prof. Schwarz in 1896. This Sheet has been issued since the end of the year.

"Mr. Du Toit spent six months in the Transkei, continuing the work done by him in 1903-4 in Elliott and Barkly East. The work brought out the fact that the Stormberg beds were tilted and disturbed to a considerable degree in the south-west of Maclear immediately before and during the volcanic outbursts of that region. The intimate connection between the Cave Sandstone and the volcanic rocks is again illustrated by the results of the survey for the Cave Sandstone is partially replaced by volcanic ash which attains a thickness of over 1,500 feet. Special attention was paid to the Gubenxa coalfield, a map of which is printed with the report, and to the coal seams in the Molteno beds elsewhere in the district surveyed. The most interesting feature in this annual report is the account of Mr. Du Toit's examination of the Insizwa intrusive rocks and the alteration of the sedimentary rocks (Beaufort beds) at their contacts. Though the igneous rocks are part of the great dolerite intrusions of the Karroo region, they are unlike any portions that have been previously described; they are more basic than the usual dolerite and they range from gabbro and norite to picrite in composition. The surrounding Beaufort beds have been converted into biotite and cordierite-hornfels. The igneous rocks of Insizwa may prove to have considerable economic importance, for they contain sulphides of copper and nickel, which have been concentrated along the contact with the Beaufort beds. Though the ores were original constituents of the igneous rock they also occur in the altered Beaufort beds in the immediate neighbourhood of the contact. The ores have been found to contain platinum. The value of these deposits has still to be proved, and a prospecting syndicate is at work on them at present. Though maps of the whole area examined by Mr. Du Toit had not been made, the Secondary Triangulation had been carried through it, and the positions of points which had not been published were kindly given by the Director of the Secondary Triangulation. The thanks of the Commission are due to Dr. Broom for determinations and short descriptions of fossils on which he is working, and to the Rev. J. H. Whaits, of Beaufort West, who has given most valuable information as to the localities of fossils found by him in the Beaufort West and Fraserburg Divisions."

THE FERREIRA IN ITS DECLINING YEARS.

History of a Famous Central Rand Outcrop Sketched in Brief—Dividends Paid, 4,415 per cent.

The projected fusion of the Ferreira and Ferreira Deep mines will remove from Witwatersrand mining returns the name of a company which has helped, perhaps more than any other, to make the goldfields of the Southern Transvaal world famous. The Ferreira has been a household word in London and Johannesburg mining circles ever since it first began to give material evidence of its wonderful richness—wonderful even for the outcrop section of the Central Witwatersrand—in the beginning of 1888.

A Wonderful Record.

Possessed of only 51 claims, and with a capital of only £95,000, the Ferreira presents a marked contrast to the huge claim areas and vast capitals which students of Rand mining have come to associate with Main Reef companies. Notwithstanding its small area, the Ferreira has, however, made history in the finances of gold mining. Up to the end of last year the Ferreira had milled three and a quarter million tons of ore, about one million tons more than the East Rand Proprietary Mines crushed in 1911. The fortunate shareholders in this company have received no less than 4,415 per cent. in dividends—that is to say, for each £1 invested in the mine when production commenced no less than £44 3s. has been received as distributed profit. From 1891 to 1899 inclusive the company distributed £1,268,500 in 17 dividends. The distributions since the war have been:—

No.	Date.	Rate %	Amount of Dividend.	Capital Paid on.
18	December 31, 1902 ...	100	£90,000	£90,000
19	June, 1903	75	67,500	90,000
20	December, 1903	112½	106,875	95,000
21	June, 1904	112½	106,875	95,000
22	December, 1904	137½	130,625	95,000
23	June, 1905	125	118,750	95,000
24	December, 1905	137½	130,625	95,000
25	June, 1906	150	142,500	95,000
26	December 1906	150	142,500	95,000
27	June, 1907	150	142,500	95,000
28	December, 1907	150	142,500	95,000
29	June, 1908	150	142,500	95,000
30	December, 1908	150	142,500	95,000
31	June, 1909	350	332,500	95,000
32	December, 1909	250	237,500	95,000
33	June, 1910	150	142,500	95,000
34	December, 1910	150	142,500	95,000
35	June, 1911	100	95,000	95,000
36	December, 1911	100	95,000	95,000

The Company in its Infancy.

The Ferreira has not of recent years caused much excitement in local mining circles. Shareholders are to be congratulated on the fact that it has plodded steadily along and has continued to earn profits which must be reckoned eminently gratifying for a mine approaching the end of its life. That it has had a remarkably profitable existence may be appreciated from the statistics as to dividends given above, or one may turn to the early files of the *South African Mining Journal* and see what an important power the Ferreira was in the very infancy of gold mining in the Southern Transvaal. Thus, for instance, in the first volume of this journal we find it recorded that the working costs amounted to 36s. 5d. per ton, that the " rock cut " for the month was 489 feet, that 2,392 ozs. were recovered from the battery, that 116 tons of concentrates assaying 4 ozs. 8 dwts. per ton were caught, and that the cyanide works produced 1,323 ozs. The Ferreira Company had in those days a capital of £45,000, and it is significant of the general esteem in which the company was held twenty years or more ago that by reference to a sharemarket list in the same issue of the *Journal* it may be ascertained that there were no sellers of Ferreiras. There have, in fact, on very few occasions throughout the whole history of the mine been many Ferreira shares for sale. The stock has been carefully held, and shareholders have been well content to sit tight and retain all their interest in what has been something a good deal more valuable than a " veritable gold mine," as the saying has it, for although the Ferreira is and always has been a gold mine it has vastly exceeded in profitability the sense in which that estimable expression is generally held. The Ferreira has had an even, undisturbed career. There have been no sensations to disturb the even tenour of its ways. In fact, one might almost be inclined to term the history of the Ferreira uninteresting. There have been remarkably few changes in its management —Messrs. J. Harry Johns and Palmer Carter have superintended the company's affairs throughout practically the whole of the life of the mine. There have been no sensational declines or remarkable increases in the returns of the Ferreira, except perhaps in so far as the very early days of its existence are concerned. In fact, one might almost say that the acquisition of the Worcester property just after the war and the attendant extension of crushing operations and working of lower grade reef areas has been the only event really calling for remark in the post-war history of this serenely profitable mine.

The End in Sight.

Of course it has for long been recognised that the end of the company's profitable existence was approaching. At the meeting held in March, 1910, the chairman directed attention to the fact that the mine had been working for over twenty years, and still had a computed life of three years, " which I hope will be further extended." He further stated: " After the mine is worked out and deproclaimed, we shall still have our freehold rights, machinery and other assets to deal with. It will be noticed that the 38 Bewaarplaatsen and 96 machine stands, which heretofore have been included in the property owned by the company, have been omitted in the accounts now submitted. As shareholders are probably aware, it has been decided that the mineral rights under Bewaarplaatsen, etc., are vested in the Government to be disposed of at their discretion. Your company's interest is therefore confined to its 19·37 per cent. of the net proceeds which may accrue to the Central Rand Freehold Proprietary, Ltd., for the sale or disposal of the mining rights under certain Bewaarplaatsen, water-rights, etc., situate on the farms Doornfontein No. 24 and Turffontein No. 21, in which they as freehold owners may be proved to have a legal interest or right." Most of the ore coming from the mine to-day is being derived from old workings, reef packs, and isolated pillars. It is interesting to note that at the end of December the cash held by the company was about £359,000, subject to liabilities of £198,000.

Bellevue Tin Occurrences.

With regard to the occurrence of tin on the farm Bellevue in the neighbourhood of the norite, or near the base of the granite, we are informed that Messrs. Cowan and Hughes have struck a band of what they term altered granite which has a width of about 30 feet, and which they have traced over a distance of about 5,000 feet along the surface. Assay returns show 0·45 per cent. tin, it is stated, and two lodes in the vicinity are declared to give assays of 0·25 and 0·13 per cent. tin respectively. The existence of tin at this horizon, as we have pointed out previously, is an important feature in connection with the question of persistence of ore in depth in the Potgietersrust tin-field.

THE YEAR WITH CROWN MINES.

Increased Profit of £88,881 Due to Higher Tonnage Crushed and Improved Recovery—Grade of Ore Unchanged—Mine Still in Transition Period—Points from Consulting Engineer's Report.

Mr. Henry Stuart Martin, consulting engineer to the Crown Mines, reports, inter alia, as follows:—The operations of the company for the past year have resulted in an increased profit from current ore treatment of £88,881, the profit amounting to 15s. 8d. per ton milled. The grade of ore mined has been identical with what was mined in 1910, but owing to the increased rate of sorting, the recovery has been higher by 1s. 3d., and although there is an increase in working expenditure of 1s. 2d. per ton, the profit realised per ton has been slightly higher. This, taken in conjunction with the additional tonnage milled of 104,500 tons, has resulted in the increased profit above-mentioned. Conditions at the mine are still abnormal and will so continue until all of the work estimated for in the enlarged programme has been completed, which we hope will be towards the latter part of the current year. This work is being pushed forward with all possible rapidity, but with a property of such huge extent radical alterations in the general lay-out and extensive additions to plant are only to be effected gradually. Working costs are naturally considerably penalised during this transition period. The company still continues to be severely handicapped by the shortage of native labour, and not only is the supply deficient but the labour force as a whole is less elastic. Development operations were again conducted on a very extensive scale, the resultant footage totalling 71,023 feet, of which 59 per cent., or 42,176 feet, were in reef formation. The ore disclosed amounted to 4,712,353 tons, of an average value of 7.3 dwts.

Ore Reserves.

From the general manager's report, it will be seen that the company's payable ore reserves at 31st December, 1911, were estimated as follows:—Main Reef Leader, 5,165,061 tons, value 8.0 dwts.; South Reef, 4,959,011, value 6.5 dwts.; total and average, 10,124,072 tons, value 7.25 dwts. This represents an increase of 3,841,353 tons over the reserves reported at December 31, 1910, which is about 9 per cent. more than what would be expected from the company's record of tonnages stoped and developed during the year. This apparent discrepancy is, in the first place, due to the fact that a portion of the tonnage mined came from old workings, footwalls, etc., not included in the reserve, and, in the second place, stoping operations during the year have shown that in the previous estimate the widths at which certain blocks could be stoped were slightly under-estimated. The above ore reserves may be analysed as follows:—Tonnage completely blocked out for stoping, 7,325,885 tons, value 7.4 dwts.; tonnage fully valued but not quite completely blocked out for stoping, 2,371,016 tons, value, 6.6. dwts; total, 9,696,901 tons, value, 7.2 dwts.; tonnage in shaft and boundary pillars, 427,171 tons, value 8.4 dwts.; total ore reserves, 10,124,072 tons, value 7.25 dwts. The blocks under (2) will be made ready for stoping during the current year's development operations, and most of them during the next few months. In addition to the tonnages above reported, there is a considerable tonnage above the 13th level, amounting to approximately 1,250,000 tons, which has not been included in the ore reserves as it cannot at present be valued. To develop this ground, no further driving will be necessary, however, as it will be gradually opened up by the advancing stope-races. The widths on which the above tonnages have been calculated are 62 inches for the main reef leader and 62 inches for the south reef.

Construction Work.

During the year there has been a large amount of construction work in progress. The expenditure has amounted to £497,155 13s. The completion of the programme is now well in sight, and I feel sure that the expenditure involved will never be regretted, as once the programme is completed the entire property will be unified, both on the surface and underground, and economy and increased efficiency must result.

Roberts Victor Diamonds.

Mr. G. C. Fox, consulting engineer to the Roberts Victor Diamond mine, reported as follows, inter alia:—The following is an outline of the work done on the property since the date of the last annual report: Mine.—The chambering of blue ground has been carried on from 194 feet to the 314 feet levels, and all the available payable ground above the latter level has been extracted. At the present time about 13,000 loads of blue still remain dumped at the surface; this will be washed at the rate of about 500 loads per day until it is exhausted. During the period referred to, some 4,600 feet of driving and sinking has been accomplished. The area of the fissure which has been opened up on the 394 feet level from the old mine equals about 34.5 claims. These values, according to the test washings, appear to increase fairly consistently from north-east to south-west, the average of the whole number of tests, representing 2,959 loads washed, being 30 carats per 100 loads, valued at 19s. per carat throughout. The value per load on the above basis would be about 5s. 8d., and, as the working costs on a body of the kind could not be less than 7s. 6d. or 8s. per load, this part of the mine must be considered unpayable. Should the narrow and richer part of the fissure only be worked, the costs would be considerably increased, and the prospects would not be improved to any appreciable extent.

Roberts Victor Diamonds, Ltd.

The output from the company's mine for February was as follows:—19,313 loads washed, yielding 5,474¾ carats of diamonds.

Voorspoed Diamonds.

The specification of rough and uncut diamonds registered by the Resident Magistrate of Kroonstad during the month of February is valued at £14,885.

New Eland Diamonds.

The directors of the Eland Diamond Company report that the washing returns for February are as follow:—Number of loads (of 16 cubic feet each) washed, 6,120; diamonds found, 940 carats; percentage, 15·36 carats. Heavy rains seriously interfered with washing operations during the month.

Barberton Mines.

Mr. G. D. Brown, of French Bobs, has been appointed manager of the Fortuna Mine, owned by Messrs. Carlin and Chew. Mr. Thomas has been appointed manager at Fairview for the Transvaal Consolidated Lands, and Mr. Fothergill has been appointed mine captain.

"T.C.L." REWARDS FOR PROSPECTORS' DISCOVERIES.

Full Details of New Conditions.

The following are the new conditions governing the rewards of prospectors who make discoveries on "T.C.L." farms:—The prospector who, in the course of prospecting, makes a discovery of base metals, shall be entitled to a discoverer's right subject to and on the following terms and conditions: (1) The discovery shall be notified in writing to the Mining Commissioner and the Company within fourteen days of its having been made. (2) The farm in respect of which the discovery is claimed shall be situated not less than ten miles from any farm upon which base metals are being worked or opened up or upon which the company itself is prospecting. (3) The discovery must be recommended by the Mining Commissioner after inquiry and investigation as being one which should be regarded as a genuine discovery. (4) Not more than one discovery right will be granted in respect of any one farm. (5) The discovery right, which must be applied for within three months of notification of the discovery, shall be awarded, should he think fit, by the Honourable the Minister of Mines, and shall consist of an area of not less than 500 yards square nor more than 700 yards square to be selected by the discoverer within one month after award on the farm in respect of which the discovery is claimed. (6) The discoverer and the company shall, thereupon, enter into a tributing agreement in respect of the area thus selected on the terms and conditions set forth in the draft copy which is deposited with the Mines Department, the principal terms of which are as follows: (*a*) The area selected shall be worked continuously and to the satisfaction of the Mining Commissioner, and, should work not have been so commenced by the termination of nine months from the date of the award, a sum of £20 a month for the first ensuing period of twelve months and of £40 a month for the second ensuing period of twelve months shall be paid monthly to the company until such time as work has been so commenced; failing which, or should work not have been commenced to the satisfaction of the Mining Commissioner by the termination of the second period of twelve months, the agreement shall, *ipso facto*, be cancelled and the area awarded shall revert to the Company. Similarly, should work having been commenced be discontinued or become insufficient to satisfy the Mining Commissioner, a sum of £40 a month shall be paid monthly to the Company commencing three months from the date of such stoppage, or on receipt of notice from the Mining Commissioner that insufficient work is being done, and if the work is not recommenced or increased to the satisfaction of the Mining Commissioner within fifteen months from that date, the agreement shall, *ipso facto*, be cancelled and the area awarded shall revert to the company. (*b*) The consideration payable to the company shall be a percentage of the net profit accruing from the working of the area awarded on the following scale:—If the profit does not exceed 20 per cent. of the gross revenue derived: 15 per cent. If the profit exceeds 20 per cent and not 30 per cent. of the gross revenue derived: 20 per cent. If the profit exceeds 30 per cent. and not 40 per cent. of the gross revenue derived: 25 per cent. If the profit exceeds 40 per cent. of the gross revenue derived: 30 per cent. The amount due as above to the company shall be calculated on the same basis as that in force in calculating the amount of the Government profits tax and the latter shall be deducted before adjustment with the Company. Copies of the tributing agreement may be seen at the Office of the "T.C.L." Company and at the office of the Department of Mines.

Royalty and "DE RESZKE" CIGARETTES.

DE RESZKE Cigarettes have fought many battles on quality. They win because their quality is the highest and is constant. Their latest success is an order from His Royal Highness the Duke of Connaught, the new Governor-General of Canada. They were selected after critical comparison with samples from all leading manufacturers. Although not the first time 'De Reszke' Cigarettes have been honoured with Royal patronage, we take particular pride on this occasion, because His Royal Highness the Duke of Connaught is well known to be a connoisseur of fine discrimination.

DE RESZKE Cigarettes can be obtained **everywhere** throughout South Africa, from all Tobacconists, Hotels, etc.

SCHÄDTLER, Limited, P.O. Box 3284, Johannesburg.

THE YEAR WITH THE WIT. DEEP.

Water Trouble Delays Development Work—Exaggerated Fears of Dyke Intrusions—Increased Native Wages and Recruiting Costs Reduce Profits—The Ore Reserve Question.

The following table is a summarised statement of the mining and reduction work at the Wit. Deep since crushing started:—

	Year.	Tons Mined.	Tons Sorted.	Tons Milled.	Screen Value. Dwts.	Cost per Ton. s. d.	Profit per Ton. s d.	Dividends Paid. Amount. £	s.	d.	Rate %
Balmoral Plant.—	1902	15,827	2,680	13,147	6·75	13/9·25	8/6·29				
,,	1903	97,870	13,187	84,683	9·71	24/1·36	8/10·90				
,,	1904	51,337	10,565	40,772	11·04	27/0·32	10/3·99				
Wit. Deep Plant.—	1904	10,622	1,760	8,862	9·12	—	—				
,,	1905	279,951	36,934	243,017	8·97	23/11·96	10/1·91				
,,	1906	399,306	63,426	335,880	8·49	20/9·15	12/7·99	237,500	0	0	47½
,,	1907	471,114	85,004	386,110	8·84	19/7·27	14/11·93	212,500	0	0	42½
,,	1908	557,396	114,976	442,420	8·51	17/6·01	16/1·67	285,256	8	0	55
,,	1909	562,987	92,487	470,500	7·90	15/9·86	15/3·69	295,512	16	0	55
,,	1910	518,832	44,172	474,660	7·45	16/2·20	13/7·53	271,824	0	0	50
,,	1911	564,188	64,818	500,330	7·33	17/2·89	12/0·64	192,500	0	0	35
Totals and Averages	...	3,529,430	530,009	3,000,381	8·19	18/5·71	13/6·91	1,495,093	4	0	285

Despite many troubles, the Wit. Deep makes a fairly good showing for 1911. The reports and financial statements are being circulated amongst shareholders before the holding of the annual general meeting, and cannot as usual be accompanied by the Chairman's speech, in which it has been customary to refer to particular points of interest in connection with the company's operations, and to endeavour to elucidate questions in the technical reports which might present some difficulty to shareholders. This being the case, the consulting engineer and the manager have given the fullest detailed information in connection with the operations for the past year, the question of development, the ore reserves, the difficulty which has been experienced with the inrush of water, and the effect of this inrush on development work, and the directors invite shareholders to give these reports careful consideration, as they feel sure that the several questions, which have given rise to various rumours, will be found to have been lucidly dealt with in the reports referred to. The outstanding feature of the year has been the water trouble, and the delay in development work which has resulted therefrom. The consulting engineer reviews the question in its various phases, and also refers to its effect on present operations. The directors state that from the many enquiries that have been received from shareholders, it appears that the intrusion of the dykes in the lower levels of the mine has caused uneasiness. A reference to the consulting engineer's report will show that although dykes in a mine entail cross-cutting to the reef and, consequently extra time and expense, they offer no insuperable difficulties in mining. The water is the chief difficulty with which the company has been faced and which the management is doing all in its power to cope with successfully. The tonnage crushed during the past year amounted to 500,330 tons, as against 474,660 tons during 1910. The profit, however, was £301,542, as against £323,413 for the previous year. An important factor in connection with the decrease in the profits was the increase in the cost of native wages and recruiting expenses, which increase, as the manager points out, amounted to practically one shilling per ton. This amount, however, does not fully reflect the additional cost in connection with the unskilled labour, as although the cost was higher there was not a corresponding increase in efficiency. The ore reserves on the 31st December last stood at 1,436,202 tons, of an average value of 6·79 dwts. over 48·6 inches, as compared with a total on the 31st December, 1910, of 1,692,922 tons at 7·16 dwts. over 48·81 inches. A factor which contributed to the decrease in the average value per ton was that the development during the past year, amounting to 117,797 tons, had an average value of 6·14 dwts. per ton, and was chiefly in the eastern and western portions of the property, and practically no development could be accomplished in the central portion of the property, which has hitherto, as a whole, given the highest values. The appropriation account may be summarised as follows:—Credit balance brought forward from last year, £35,178 15s. 5d.; profit on working during 1911, £301,542 9s. 5d.; interest, sundry revenue and freight rebate on gold, £1,975 7s. 1d.; total, £338,696 11s. 11d. From which have to be deducted:—Government tax on profits for 1910, £28,256 10s.; audit fees for 1910, £262 10s.; interest on debentures, £2,486 11s.; debenture trustees' fees, etc., £333 3s. 6d.; income tax paid in England, £48 0s. 2d.; capital expenditure during 1911, £33,236 3s. 8d.; redemption of debentures, £8,780; dividend No. 11 of 25 per cent., £137,500; dividend No. 12 of 10 per cent., £55,000; directors' remuneration on profits in accordance with articles of association, £1,000; total, £266,902 18s. 4d.; leaving a balance to be carried forward of £71,793 13s. 7d. It should be borne in mind that from the above balance the profits tax payable to Government upon the past year's operations, say about £27,000, will require to be deducted, whilst £18,000 are temporarily locked up in Victoria Falls Company's shares. The capital expenditure during the past year has been as follows:—Machinery and plant, £17,229 3s. 8d.; shaft sinking, £18,945 7s. 10d.; furniture, livestock, etc., £293 8s. 1d.; Witwatersrand Co-operative Smelting Works, Ltd. (further shares acquired), £73 12s.; total, £36,541 11s. 7d. Less:—Buildings, £2,021 13s. 11d.; W.N.L.A. shares (4,279 at 6s. repaid), £1,283 14s.; total, £3,305 7s. 11d.; leaving a total capital expenditure of £33,236 3s. 8d. During the financial year £2,110 of the first and £6,670 of the second issue of debentures, making a total of £8,780, were drawn and duty paid, the company's liability to the debenture holders being thereby reduced to £40,820. On the 30th June the directors declared an interim dividend No. 11 of 5s. per share (25 per cent.) for the first half-year, and on the 31st December, an interim dividend of 2s. per share (10 per cent.) for the second half-year, making 35 per cent. for the year. As explained in a notice published in the Press, it would have been possible to have declared a higher dividend for the second half of the year, but in view of development having been hampered by the water trouble, the directors considered that it was desirable to adopt the cautious policy of strengthening the company's financial resources so as to be in the position to increase the ore reserves as soon as it is possible to resume development work on a normal basis. To enable European shareholders to receive and consider the annual reports and accounts before issuing their proxies for representation at the annual general meetings, the directors have decided to hold these in future during the month of

May in each year. To enable this policy to be carried into effect, an extraordinary general meeting of shareholders has been convened for the 25th April, 1912, to make the necessary alterations in the company's articles of association.

CONSULTING ENGINEER'S REPORT.

Mr. S. C. Thomson writes:—The actual results of milling and development operations are given very fully in the report submitted by Mr. Hardach, the manager of your property. Notwithstanding the increased quantity of water encountered, 500,330 tons of ore were milled during the past year, yielding a profit of £301,542, the slight decrease in the profit per ton milled, as compared with the previous year, being due entirely to the increase in native wages as well as the cost of recruiting and feeding. These items account for one shilling per ton milled. The development has been restricted on account of a further increase in the quantity of water to be pumped, and as this is the most important consideration with reference to the future of the mine, I will endeavour to place the position before you as clearly as possible. You will recall the fact that some years ago the Knights Deep had great difficulty with water, and this water has followed along a diagonal dyke running from north-west to south-east into your property. As this watercourse runs diagonally, causing some displacement of the reef, it was necessary to crosscut through the dyke (called the water dyke) on all levels from the 12th to the 18th, the present depth of the east shaft. Although large pumping stations had been cut and equipped, they proved inadequate to meet the exceptional inflow encountered when a crosscut intersected the footwall of the reef series in the 16th level. The rush of water was so great that before anything could be done to handle the increased quantity, the pumping station at the 18th level, already equipped to handle 1,500,000 gallons per diem, was flooded. This station, as you were informed, was recovered by baling and by using sinking pumps, and the capacity of the pumping plant has since been further increased. The mine is now equipped to deal with 3,250,000 gallons per 24 hours. It is difficult to make the position clear, for, while none of the workings are under water, it is necessary to draw off the water from each level in turn, starting with the 14th; that is to say, the work of development on the 15th level cannot be undertaken until the flow from the 14th is much reduced, and the work on each level in depth must be delayed in turn until the water from the level above has been mastered. It is impossible to estimate the time it will take to drain the various levels, but, obviously, the longer normal development operations are delayed the greater will be the depletion of the ore reserve and the greater the difficulty of keeping the mill supplied. As you are aware, the Knights Deep has not had to deal with any large amount of water for some time past, and, as noted by the Superintending Engineer of the East Rand Proprietary Mines, Ltd., in his report, it is probable that the same watercourse will be encountered in the workings of the East Rand Proprietary Mines immediately to the eastward of your property. When this occurs, it is expected that the water to be pumped from your mine will gradually decrease in the same way as it has decreased in the Knights Deep, Ltd. Your manager, Mr. Hardach, has explained the upthrow at the 18th level, where the water dyke and a dyke coming from the opposite direction meet. The values obtained by boring at this point are very good, and the duplication of the reefs will increase the tonnage above the 18th level considerably, the overlap probably extending to the 16th level. The displacement will necessitate crosscutting approximately 700 feet at the 17th level before starting the subsidiary incline, which work will delay the actual addition to the ore reserves in this section of the property. Although the necessary crosscutting and consequent delay in opening up the displaced portion of the reef will add somewhat to the expense of and interfere in a measure with normal working, yet I wish to make it perfectly clear that the water, rather than the dykes and the accompanying displacement of the reef, constitutes the difficulty in the present situation: and every effort is being made to overcome it successfully. On the other hand, there is the satisfaction of knowing that at the two points where boreholes have intersected the reef on the south side of the dyke, the values obtained are extremely satisfactory, viz., 10.1 dwts. over 51 inches on the 16th level and 12.5 dwts. over 65 inches on the 18th level.

MANAGER'S REPORT.

The Manager, Mr. E. E. Hardach, writes, *inter alia*: Payable ore developed during the year was: Main Reef Leader, 117,797 tons, valued at 6.14 dwts. over 53.36 inches; ore reserves, 31st December, 1910, 1,692,922 tons, valued at 7.16 dwts. over 48.81 inches; ore reserves, 31st December, 1911, 1,436,202 tons, valued at 6.79 dwts. over 48.86 inches. The large amount of water encountered has greatly retarded development during the past year, and although we obtained a large tonnage by resueing old workings, etc., our payable ore reserves have been reduced by 256,000 tons. Although our pumping capacity has now been increased to over 3,000,000 gallons per day, it will be necessary for us to proceed cautiously with development during the present year, and drives may frequently have to be stoped to allow the water to drain down until it is safe to proceed. During the last eight months we have made some experiments with filling worked-out areas with current sand from the cyanide plant, and have put underground 34,457 tons of sand at a total cost of 5.6d. per ton of sand filled, which is about the same as it costs to put it on the dump; and so far results have been entirely satisfactory. This filling will enable us to recover a considerable tonnage from pillars left in to sustain the hanging, and which are of the average grade of the ore mined. It will have the additional advantage of making the workings safer, and prevent the caving of old workings, thereby making them more accessible in case it is ever found possible to work the very low-grade reefs left behind, as with our steep dip it will be very easy to run the sand from any block it is desired to work into a lower stope. Although every effort has been made to maintain the popularity of our compound with the natives, we are feeling the general shortage and have 625 less natives in our compound now than at 31st December last year. The cost per shift worked of both native wages and recruiting expenses has increased during the year, and there has not been a corresponding increase in efficiency. The cost per ton milled for native wages for all purposes being 3s. 7.18d. and for compound expenses and recruiting 2s. 7.875d., as against 3s. 1.24d. and 2s. 2.621d. respectively for 1910.

Knight Central.

The report for the quarter ended 31st December, 1911 states: 120 stamps and cyanide works milled 83,293 tons. Expenditure—Mining, £45,162 2s., cost per ton, 10s. 10.13d.; development, £9,285 4s. 11d., cost per ton, 2s. 2.75d.; crushing and sorting, £2,125 11s. 4d., cost per ton, 6.12d.; milling, £7,396 0s. 2d., cost per ton, 1s. 9.31d.; cyaniding, £5,780 4s. 3d., cost per ton, 1s. 4.66d.; mine charges, £2,098 4s. 9d., cost per ton, 6.05d.; general charges, £2,543 12s. 10d., cost per ton, 7.33d.; total costs, £74,391 0s. 3d., cost per ton, 17s. 10.35d.; profit for the quarter, £20,077 4s. 5d., cost per ton 4s. 9.85d. Revenue, £94,468 4s. 8d., cost per ton, 22s. 8.20d. Capital Expenditure.—Capital expenditure for quarter was as follows: Shafts, £3,218 16s. 5d.; buildings, machinery and plant, etc., £6,061 14s. 11d.; total, £9,280 11s. 4d. No allowance has been made in the above statement for the Government's tax on profits. Milling.—Average number of stamps running, 120; time run, 76.47 days; tons crushed, 83,293 tons; duty per stamp per day, 9.08; yield in fine gold, 16,263.726 ozs.; yield per ton crushed in fine gold, 3.91 dwts.; waste sorted (5.97 per cent.), 5,258 tons. Cyaniding.—Tons treated, 83,677; yield in fine gold, 6,291.779 ozs.; cost per ton crushed, 1s. 4.66d.; cost per ton treated, 1s. 4.58d.; yield per ton crushed, 1.51 dwts.; yield per ton treated, 1.50 dwts.; recovered from all sources employed per ton milled (fine gold), 5.42 dwts. Mining.—Ore in bins, 1st October, 1911, 425 tons; ore mined and from dump, 88,146 tons—88,571 tons; less waste sorted out, 5.97 per cent., 5,258 tons—83,313 tons; tons crushed 83,293 tons; ore in bins, 1st January, 1912, 20 tons. Shaft sinking and stations—The west shaft has been sunk 132 feet to a total of 3,812½ feet, or to 72 feet below the 12th level station, and timbered 180 feet to 3,725 feet. The east shaft has been sunk five feet to a total depth of 4,130 feet. Development—Drives and cross cuts, 1,481½ feet; main cross cuts, 18 feet; raises and winzes, 1,072 feet; ore passes, nil; prospecting work, 137½ feet. Total, 2,709 feet. Reef values—Exclusive of main crosscuts, ore passes and prospecting work, 2,102 feet, or 77.59 per cent. of the development work has been on reef. Of this footage 2,085 feet have been sampled, the average value being 5.10 dwts. over 58 inches. This total comprises 1,175 feet of 56.35 per cent., averaging 2.02 dwts. over 60 inches and 910 feet or 43.65 per cent., averaging 9.49 dwts. over an estimated width of 55 inches. In this latter total is included 500 feet of Main Reef at 11.47 dwts. over 51 inches, 360 feet of South Reef at 7.49 dwts., over 62 ins. and 50 ft. of Main Reef Leader at 7.51 dwts. over 41 ins. Ore reserves—The ore reserves are being re-calculated for the annual report. Construction—New ward to accommodate twenty-eight patients has been added to the native hospital and two cottages for compound staff have been built. On the 14th December, 1911, the following official statement was published by the Board:—The Board of the Knight Central has decided not to declare a dividend for the current year, as the directors wish to maintain the financial position with the view to materially increasing the ore reserves.

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THE COPPER-NICKEL DEPOSITS OF THE INSIZWA, EAST GRIQUALAND.

[BY ALEX L. DU TOIT.*]

Valuable Account of a Promising Mineralized Area.

IT is a full score of years since the discovery of copper ore in the Insizwa Range, Mount Ayliff, was made known, but it is only in the last half decade that systematic prospecting of the occurrences has been carried out. The stimulus was afforded by the discovery of nickel in association with the copper, while further impetus was given to prospecting through the discovery by Mr. J. G. Rose, F.C.S., of platinum in the ore, though in variable amount. The development of this area has experienced the usual set-backs caused, firstly by lack of capital, most of the funds having been raised locally, and secondly by the fact that much of the earlier work was misdirected owing to the unusual habit of the occurrence and insufficient knowledge of the character of the deposit. Although time did not allow of a complete exploration of the district and more particularly of the area lying west of the Umzimvubu River, the whole of the region in which prospecting operations had been carried out was examined and geologically surveyed. For this purpose a plane-table survey was made on the scale of 600 Cape roods (about three-quarters of a mile) to an inch, the basis being the beacons of the Secondary Triangulation of East Griqualand only recently carried out.

Geology.—The strata are bluish shales, flagstones and thin sandstones belonging to the Beaufort series of the Karroo System and lying nearly horizontally. These beds have been penetrated by numerous intrusions of igneous rock belonging to the Karroo dolerites in the form of sheets and dykes. Most of this rock can be called dolerite, but the great sheet of the Insizwa Range and of the adjoining peaks and ridges is composed of a much coarser and more basic variety which can be called gabbro, of which indeed there are several distinct types, principally olivine-gabbro and olivine-norite, merging one into the other and into the dolerites. The metamorphism of the strata by the igneous rock has been intense in many places, much more so than is the rule in the Karroo or Stormberg. The copper-nickel ores are confined more or less to the contact of the gabbro and the altered sediment, impregnating the latter to a small extent, but becoming more abundant in, and sometimes restricted to, the igneous rock of which sulphides appear to be *original* constituents. The mode of occurrence of the ores is somewhat similar to that of the copper-nickel deposits of the Sudbury area in Ontario, Canada, and of Norway.

THE CHARACTER OF THE INSIZWA ORES.

Owing to the infrequent exposures of the base of the gabbro the presence or absence of ore is, as a rule, only proved by actual sinking and driving. In most instances prospecting pits have been sunk wherever the rocks were found stained with the green carbonate of copper (*malachite*)—probably also the silicate of nickel (*garnierite*)—produced by the weathering of sulphides, and usually accompanied by a good deal of hydrated oxide or iron, *limonite.* Practically three minerals make up the ore patches or bodies, two of which are always distinguishable by the eye in hand specimens. The most abundant mineral is *pyrrhotite,* a sulphide of iron of slightly variable composition, but containing about 61 per cent. of metallic iron on the average. It is recognisable by its bronzy metallic lustre, and somewhat platy structure, and by the fact that it is feebly magnetic and attracts the compass needle. The second ore is *chalcopyrite,* or copper pyrite, sulphide of copper and iron, which is easily identified by its brassy appearance and soft nature; it contains a good deal of iron, and the copper percentage is about 34.5. The third important mineral is *pentlandite,* a sulphide of nickel and iron, with variable composition, but containing on an average about 20 to 35 per cent. of nickel. Having also a bronzy colour, it cannot be identified in the hand specimen, but was proved to be present after treating polished pieces of the ore-bearing rock with acid, as will be mentioned later on in dealing with the genesis of the ores. The ores can be roughly grouped into two classes, one rich in chalcopyrite and therefore in copper, but with a low amount of nickel, and the other rich in pyrrhotite and pentlandite, and therefore having a larger proportion of nickel. This, which was first pointed out in the report of the Senior Analyst,[1] is borne out by observations in the field. It is improbable, however, that any advantage can be taken of this rough classification after mining, firstly because the ore varies so rapidly in character from point to point, and secondly because the admixture of the minerals is so intimate a one, as shown in thin sections of the ore, as to make it improbable that the nickel-bearing pyrrhotite can be separated mechanically from the chalcopyrite. In addition to these three important minerals, a small quantity of *bornite* (sulphide of copper and iron) was obtained from No. 3 adit, Insizwa, in the form of thin layers along joints in highly altered sandstone close to the contact. *Niccolite,* the arsenide of nickel, containing 43 per cent. of that metal, was observed in very thin veins in the much altered footwall from the adit of the A. Payne Syndicate. I was informed by Mr. Brennan that this is the only locality at which this mineral has been noticed. In what form the platinum exists in the ore is not yet known, but from the resemblance to the Sudbury deposits and from the existence here of arsenides, it is not unlikely that it is present in the form of *sperrylite.* Platinum was also found by Mr. Rose to be present in a sample of iron ore (ilmenite) which I collected on the eastern slope of the Insizwa after a heavy rain, the deposit occurring as occasional thin washes upon the soil derived from the weathered gabbro of the mountain.

The Ore Values.—Assays were made by Mr. J. G. Rose, in the Analytical Laboratory, Capetown, of material collected by him, and the following is a summary[2] of the values on material obtained from the adits of the Insizwa Mining Area :—

	Per cent.
Highest Copper conent	19.3
Lowest copper content	1.2
Average of 14 analyses	4.1
Highest nickel content	7.3
Lowest	0.6
Average of 14 analyses	3.8

	Per ton of 2,000 lbs.
Highest Platinum content	4oz. 19dwts.
Lowest Platinum content	12 grains.
Average of 14 assays	2dwts. 15 grains.

Cobalt, silver, gold, and osmiridium occur in traces.

Two trial shipments of some five tons each sent to England soon after the author's visit, were analysed by Messrs. Johnson, Matthey and Co., with the following results :—

	Per cent. 1.	Per cent. 2.
Copper	3.10	3.50
Nickel and Cobalt	4.90	5.25
	Per ton.	Per ton.
Gold	6 grains	6 grains
Platinum	2dwts. 12grs.	12 grains
Silver	10dwts.	12dwts.

THE GENERAL HABIT OF THE DEPOSITS.

There is every stage from a gabbro or norite with minute scattered particles of ore to a rock in which ore and silicates are in equal amounts, and finally to an almost pure ore with a few patches of silicates scattered through it. These rich sulphide rocks may form roundish or oval masses, but more commonly give rise to sheet-like bodies running along or roughly parallel to the contact and grading into gabbro nearly devoid of ore. Only in a few cases do such segregations exceed a foot in thickness, but the gabbro is often rich in disseminated sulphides. The nature of the occurrences seems to be the same all along the line of mining areas, though for large distances the base of the sheet appears to be barren. The extremely fresh state of the minerals of igneous rocks containing sulphides has been adduced as an argument for the magmatic origin of such ores It is important, therefore, to note that no minerals such as almost invariably accompany ore-deposits formed by water action have been observed along the Insizwa intrusion Quartz, calcite, chlorite, etc., are totally absent, which is most significant, for along the edges of Karroo dolerite dykes it is not uncommon to find occasionally narrow veins of quartz formed by waters ascending along the junction of the sedimentary and the igneous rocks; these usually show casts of the slickensided surfaces of the encasing walls. The Insizwa sheet approaches closely in its form to the nickel-bearing intrusive of Sudbury, but, as we have already seen, the basin-shaped form is an original feature. The Insizwa rock, though much more basic than the Canadian occurrence, is very much fresher in character, while both rocks contain a certain amount of a rhombic pyroxene, enstatite or hypersthene. Again with one exception—the very basic horizon some 300 feet above the bottom of the sheet in the Umzimklava Poort—the intrusion decreases appreciably in basicity rrom the lower to the upper edge, and though at the top there is no distinctly acid granophyric rock present, olivine is sometimes absent and there is also a small amount of quartz and micropegmatite. This is proved by the silica percentages already quoted of rocks from different horizons, namely, 43 per cent. at the base, 48 per cent. half-way up, and 50 per cent. at the summit. This shows that there has been a differention of the mass to a limited extent. the more basic portion of the magma having gradually concentrated itself towards the base of the sheet. Another point to be noted is the fact that the gabbro or norite contains rather more abundant feispar and olivine and less pryoxene than the usual type of coarse dolerite, while again, and this is most conspicuous, the rock is deficient in magnetite and ilmenite. It is for this reason that the gabbro is so light-coloured in the field and also that its average specific gravity (excluding the very basic types and ore-bearing varieties) is only 2.96, whereas in the majority of the dolerites the density is a little closer to 3.0. It seems as if the sulphides had partially replaced the iron oxides normally present in such intrusions, and that in settling towards the base of the molten rock during the cooling of the latter the ores had become entangled in the silicates that had already separated out from the magma. It is most interesting to find, too, that the copper ores of Namaqualand (Cape Colony) not only occur in hypersthene-bearing dykes, the bornite (with chalcopyrite) being disseminated through the dyke material or collected together to form great masses, but that the ores appear to be original constituents of the igneous rock. So frequently are copper and nickel ores found as magmatic segregations in basic and ultrabasic rocks possessing enstatite or hypersthene as to suggest that the metallic sulphides may have determined the partial or complete crystallisation of the pyroxene in the rhombic instead of the monoclinic system.

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*Extracts from Report to Cape Geological Commission.

[1] Report for the year 1908, p. 118.

[2] The South African Journal of Science. vol. vii., p. 130, 1911.

Conclusion.

Too little work has been done to prove either the economic value of the deposits or their exact extent, but it is to be hoped that with development more will be learned of the nature of these interesting occurrences. No opinion can be given as yet as to whether the gabbro will become more mineralised when followed inwards below the range. The experience at Sudbury[1] has been that the largest ore bodies have been found where the norite projects outwards into the country rock or forms a dyke-like offset into the adjoining formation, while deposits of importance have seldom been found along a straight margin. No deposits again have been found any distance away from the margin, and none along the (upper) contact of the intrusive sheet with the overlying sediments. No ore-bodies have been discovered away from the main mass, except on isolated dyke-like intrusions of norite, which evidently were of the nature of feeders. The reported occurrences of copper ores along the base of the Ingeli Mountain and in the Tabankulu Mountain as well, induce one to hope that prospecting will ultimately lead to the discovery of ore-bodies of considerable economic value in this region, favoured as it is by an abundance of water, a fair amount of timber, and with a large native population, thus ensuring a constant supply of labour.

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[1] A. P. Coleman, loc. cit. p. 19

Glynn's Lydenburg.

The following are particulars of the February output of Glynn's Lydenburg:—Tons crushed, 2,897; yielding 1,569 ozs. fine gold, valued at £6,517. Estimated profit for the month, £3,629.

Sheba and Rosetta.

The output from the Sheba Mine for the month of February was 2,799 ozs. of fine gold, an increase of 84 ozs. of that for January. The Rosetta Mine's output for the same month was 461 ozs. of fine gold, an increase of 30 ozs. over January.

Manicaland Mineral Output.

The mineral output of the territory of the Companhia de Moçambique (Manicaland) for the month of January, 1912, was as follows:—Reef: Mill, gold won (fine gold) 248 ozs. 7 dwts. 5 grs.; tons crushed, 1,281; value, £1,043 1s. Cyanide: Gold recovered (fine gold), 17 ozs. 9 dwts.; tons treated, 400; value, £73 5s. 3d.

Natal Coal Returns.

The coal and labour return of Natal Province for January, 1912, is as follows:—

	Average Labour	Output (Tons of 2,000 lbs.
Natal Navigation	1,100	32,618
Hlobane	933	27,178
Durban Navigation	1,132	24,977
Burnside	858	17,990
St. George's	756	17,954
Glencoe (Natal)	840	16,011
Natal Cambrian	679	14,490
Utrecht	384	12,320
Elandslaagte	1,192	12,200
South African	829	12,047
Dundee	478	6,545
Newcastle	414	5,908
Ramsay	316	5,855
Hatting Spruit	452	5,659
Ballengeich	337	5,076
Natal Steam	250	4,533
Dewar's Anthracite	83	566
Star	24	326
Vaalbank	3	10
Makatees Kop	2	8
Totals	11,062	222,271
Corresponding month, 1911	11,379	214,225

The coal bunkered and exported at Durban was as follows:—Bunker coal, 102,840 tons; coal exported, 41,703 tons; total, 144,543 tons.

Rietkuil Gold Mines.

The report of the directors for the year ended 31st December, 1911, submitted at the fifteenth ordinary general meeting of shareholders held yesterday, states *inter alia*: Prospecting operations on the company's property ceased in April last, the parties to whom the option to reconstruct the company was granted having continued to advance funds to the company for the purpose of prospecting the property to the date of the closing down of the mine. The amount of this loan with accrued interest at 31st December, 1911, had reached the sum of £26,514 15s. 8d., and as was mentioned in the last annual report an irrevocable power of attorney to bond the company's property had been granted to these parties as security for this loan. The agreement which was provisionally renewed by the directors for a further period of one year expired on the 29th January, 1912, and was not renewed. During the year under review the general expenditure has amounted to £5,656 5s. 3d., of which interest and claim licences account for £4,696 2s. 2d. The sum of £1,423 18s. 3d. has been expended on capital account under the heads of mine development, stable equipment and furniture. Against this expenditure the amount of £49 3s. 7d. was received from sundry revenue. The first loan from some of the larger shareholders with interest to 31st December, 1911, stands at £45,742 4s. 11d. The company still holds 30,000 reserve shares. To enable European shareholders to receive and consider the annual reports and accounts before issuing their proxies for representation at the annual general meetings, the directors have decided to hold these, in future, during the month of May in each year. With this aim in view, an extraordinary general meeting of shareholders has been convened for the 25th April, to make the necessary alterations in the company's articles of association.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted for the consideration of the Editor that is not accepted by him will be returned if a stamped and directed envelope is enclosed for the purpose.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' Examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings, Box 2061, Johannesburg.

THE FEBRUARY OUTPUT: GROUP RETURNS.

Native Labour Shortage Still Affects the Output and Profits.

Rand Mines Group.

Results of crushing operations of subsidiary companies for the month of February were as follows:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep ...	300	7	62,000	17/8·5	20,590	£31,492
Geldenhuis Deep	300	7	56,710	23/4·8	19,127	13,695
Nourse Mines ...	260	7	51,100	22/1·9	18,080	19,002
Ferreira Deep ...	160	4	29,140	24/7·4	16,354	32,588
Crown Mines ...	660	26	149,100	18/3·8	58,633	108,498
Durban Rood. D.	100	3	22,000	24/9·5	7,637	4,714
Totals & average	1780	54	370,050	20/4·8	140,421	£209,989

Reserve Gold.—Rose Deep, 6,125 ozs.; Geldenhuis Deep, 409 ozs.; Nourse Mines, 587 ozs.; Crown Mines, 4,824 ozs.; total, 11,945 ozs.

Results of crushing operations of Eckstein companies for the month of February were as follows:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder " B " ..	80	5	29,500	19/ 2·3	11,934	£21,500
New Modder ...	180	7	46,200	19/ 7·0	19,225	35,000
City Deep	110	9	37,940	22/ 1·1	14,722	19,547
Village Deep ...	180	6	47,200	20/ 6·4	16,877	22,083
Village M. R. ...	220	6	29,950	21/ 9·7	14,534	27,882
Ferreira	85	3	21,350	16/11·5	7,133	11,208
Robinson	250	6	44,000	16/10·4	25,633	70,000
Bantjes Cons. ...	65	3	21,910	25/ 8·9	8,164	6,022
Totals & average	1170	45	278,050	20/ 1·7	118,222	£213,242

Reserve Gold.—Modder " B," 5,828 ozs.; New Modder, 9,362 ozs.; Village Deep, 5,900 ozs.; Village Main Reef, 1,192 ozs.; Ferreira, 2,470 ozs.; Robinson, 10,556 ozs.; Bantjes Consolidated, 710 ozs.; total, 36,018 ozs.

The Village Main Reef G.M. Co., Ltd.—Labour still short, but steadily increasing.

Barnato Group.

The following are the results of the February operations of the producing mines of the Barnato group:—

COMPANY.	STAMPS.	TONS.	REVENUE.	PROFIT.
Consolidated Langlaagte	140	20,216	£27,015	£7,912
Ginsberg G.M. Co.... ...	80	12,507	19,339	6,014
Glencairn Main Reef ...	160	16,312	14,693	2,348
New Primrose	160	22,500	33,023	17,020
New Rietfontein	120	15,640	20,766	4,129
New Unified M.R. ...	60	10,060	16,196	4,613
Quest G.M. and Dev. Co.	30	2,231	2,659	662
Witwatersrand G.M. ...	220	34,830	40,735	15,575
February totals ...	970	134,296	£174,426	£58,273
January totals ..	970	137,429	176,280	59,227

Monthly gross profits: January, £59,227; February, £58,273.

The Albu Group.

The following are particulars regarding the February operations of the producing mines of this group:—

Company.	Stamps.	Tube Mills.	Tons Crushed.	Total Cost.
Aurora West	60	—	11,640	£11,401
Cinderella Consol.	65	3	13,640	17,828
Meyer and Charlton ...	75	2	13,118	12,042
New Goch	120	4	24,048	23,218
Roodepoort United	50	3	27,263	25,534
Van Ryn	125	6	37,500	29,114
West Rand Consol.	100	4	27,300	29,458
	595	22	154,509	£148,595

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	19/7·0	£13,903	£2,502
Cinderella Consolidated ...	26/1·6	18,230	402
Meyer and Charlton	18/4·3	26,428	14,386
New Goch	19/3·7	26,382	3,164
Roodepoort United	18/8·7	27,743	2,209
Van Ryn	15/6·3	52,144	23,030
West Rand Consolidated ...	21/6·9	32,165	2,707
		£196,995	£48,400

Cinderella Consolidated.—Low profit due to small tonnage owing to shortage of native labour, which is now being overcome.

New Goch.—Profit reduced in consequence of small tonnage, due to unfavourable underground conditions which are expected to be of a temporary nature.

Roodepoort United.—Fall of grade in main reef stopes responsible for reduced profits.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of February of the undermentioned companies of the Consolidated Gold Fields Group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ...	320	7	64,400	18,584	£39,647
Robinson Deep	210	5	47,300	18,076	36,786
Knights Deep	270	6	53,600	11,892	18,351
Simmer East	130	3	28,300	5,788	2,928
Simmer Deep	110	9	44,350	9,787	4,754
Jupiter	80	6	32,850	8,404	5,440
Luipaardsvlei	60	3	16,110	3,593	2,940
Sub Nigel	30	1	4,150	1,852	851
Totals	1210	40	291,060	77,976	£111,697

Reserve Gold.—Simmer and Jack, 1,255 ozs.; Robinson Deep, 3,666 ozs.; Sub Nigel, 100 ozs.; total, 5,021 ozs.

The " total profit " shown above includes sundry revenue, viz.: Simmer and Jack, £1,500; Robinson Deep, £1,748; Knights Deep, £755; Simmer East, £17; Simmer Deep, £614; Jupiter, £287; Luipaardsvlei, £930; Sub Nigel, £308. Total £6,159.

Luipaardsvlei.—Total profit also includes £1,123 net proceeds from 456 ozs. of gold from accumulated slimes.

Knights Deep.—Decreased profits due to 5,080 less tons having been crushed in February as compared with January, owing to short month.

Simmer Deep.—In the above profit is included 334 ozs. of gold applicable to the January output.

Jupiter.—In the above profit is included 320 ozs. of gold applicable to the January output.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Question of Ore Weighing.

E.R.P.M. METHODS.

To the Editor, *South African Mining Journal.*

Sir,—A friend of mine in England who is well acquainted with colliery practice tells me that one of the points in the E.R.P.M. reports that struck him as being quite at variance with English experience, and something, moreover, that required a great deal more explanation than was apparently considered necessary, was the alleged difficulty of getting at the actual weight of ore sent to the mill. My own knowledge of coal mining methods, not of very recent date, I admit, inclines me to the belief that the pretext as to the impracticability of ore weighing is absurd. If it is not impracticable to record the actual weight of every tub of coal by means of a weighing machine and the assistance of a man kept in a small room for the purpose of reading the figures, it is surely not impossible nor inconvenient to carry out a similar operation on truck loads of banket. There are ample intervals of time for the work, and the cost, distributed over the tonnage weighed, would be quite nominal. I am not taking into account other methods of arriving at a proper estimate of the tonnage, as, for instance, the one of automatic weighing machines of the Dennison type which are installed at various mines on the Rand. At Kleinfontein, for instance, they are said to be doing satisfactory work, thanks to the intelligent manner in which they are checked and counter-checked at regular periods. The importance of keeping a proper tally upon the quantity of ore going to the mill is so obvious, apart from the lucid statements of the E.R.P.M. Commission upon the point, that it is unnecessary to dwell upon it. One can only feel astonishment that in these days of progress and enlightenment there should be any ore weighing problem at all. The only explanation I have been able to give my friend is that the alleged difficulty is "all piffle."—Yours, etc.,

ENGINEER.

The Responsibilities of Directors.

To the Editor, *South African Mining Journal.*

Sir,—Since "effective reform," as Mr. Schumacher termed it at the E.R.P.M. meeting in London, appears to be very much in the air at present, I venture to make a few remarks on the subject of directors, their functions, responsibilities, and abilities. To my way of thinking, the appointment of Mr. H. Ross Skinner to a seat on the Board of the East Rand Proprietary Mines is one of the best things that has been done in the interests of shareholders in that company. As a London paper very rightly remarks, "one independent director, chosen for his knowledge of mining affairs, should sit on the board of each company, not to represent a financial group nor his own holding, but the shareholders." In fact, I would go so far as to advocate the appointment of fully qualified mining engineers on the board of every company prosecuting mining operations.

Not only on the Rand, but in Rhodesia, have some heinous mistakes been made in mining of late. Had qualified mining men been sitting on the boards, some, at any rate, of these errors would not have been made. Really, the ignorance of some directors is amazing. For instance, in the action brought against the Rhodesian Exploration and Development Company in regard to the purchase of the Elumba claims, it is recorded that Mr. H. G. Latilla, a prominent director, on being asked if he had consulted the plans of the mine, replied: "No. In the first place, I do not understand plans properly." Now, sir, this is not as it should be. All the directors of a mining company should have a fair knowledge of mining operations, mining economics, and mine plans. They should be further strengthened in their knowledge of mining and metallurgy by a co-director who is a mining engineer as well as a mining director. It is pleasing to note that such a course is being adopted by one or two South African companies.

In addition to Mr. H. Ross Skinner's appointment to the board of the E.R.P.M. mines, I observe that the name of Mr. Arthur Dickinson, who is a mining engineer of high repute, has been added to the Board of Directors of the Amalgamated Properties of Rhodesia. If the boards of South African mining companies contained more of the professional mining element, and less of the political, it would be well for all concerned.—I am, etc.,

VIGILANT.

Johannesburg, January 6, 1912.

Commerce and Industries Commission.

To the Editor, *South African Mining Journal.*

Sir,—I observe that the Commissioners, in compiling their reports on the evidence submitted, "were considerably handicapped by the absence of statistics relating to the production of the industries, the values of material consumed, the cost of labour, etc." In calling for evidence *gratis* and *pro bono publico*, one would have thought that this Commission would have adopted the simplest form, so that those wishing to give evidence before the Commission would be put to the least trouble possible. From the printed "Method of giving evidence" sent out by the Joint Secretaries to those writing for particulars shortly after the formation of the Commission, I take the following extracts:—

> METHOD OF GIVING EVIDENCE.
>
> To ensure precisely those points being brought forward which are deemed essential to the improvement of conditions now prevailing, to ensure nothing being forgotten and absolute accuracy in the records, and to save time:—
>
> *It is suggested*: That every Witness, or Association of Witnesses, shall prepare all the points to be brought to the attention of the Commission, in *Question* and *Answer* form, and, if possible, typewritten.
>
> Thus the Witness, knowing the point he wishes to make, first puts down a *Question* that bears on the subject of the intended *Answer*, and then in the *reply* to that Question he should make his point.
>
> The Questions and Answers should be *numbered* correspondingly.
>
> This will be considered the "*Evidence-in-Chief*" of the Witness.
>
> As there are seven Commissioners, *eight copies* should be supplied, one for each Commissioner, and one for the Office record. *The latter should be dated and signed by all parties* giving that evidence, or in the case of Chambers of Commerce and Associations, by the Chairman and Secretary.
>
> The above eight copies should be sent *as soon as completed*, but in any case not later than 31st December, 1910, to the Joint Secretaries of the Commission.

A type-written note accompanying the official questions reads: "Nine copies of official questions enclosed, eight of which please fill in and return, the other copy to be brought by witness when the Commission sit for cross-examination in your centre." In addition, it will be seen the Commission wanted eight copies of evidence in chief. Whose time did they want to save? I remember Mr. A. F. Crosse, Consulting Metallurgist, suggested to the Commission through your columns that a museum should be established in Johannesburg for the exhibition of the natural products of the country, so that engineers and financiers might readily get into touch with those holding the beginning of an industry. If Mr. Crosse embodied his suggestion in the prescribed "evidence in chief" and forwarded eight copies thereof to the proper quarter, we ought to see this suggestion now amongst the recommendations of the Commission. Mr. Crosse is a man adverse to self-advertisement, so I am afraid we have the story of the seed that fell on stony ground.—Yours, etc.,

G. A. ROBERTSON.

Rhodesian Section.

LATEST MINING NEWS.

The Position at the Eldorado : Mr. Piper's Report—Rhodesian Ore Reserves—The Filabusi District—Globe and Phœnix Developments—Mr. Triggs Active in Matabeleland—The Jumbo Quarterly Report—The Newery Claims.

In consequence of the numerous adverse rumours that have recently been in circulation regarding the Eldorado Banket Mine, special interest attaches itself to the investigation of the mine carried out by Mr. H. A. Piper. The following cable was despatched to the London office of the company on the 22nd ult:—"I fully endorse H. E. Jones' telegram of January 8th, since when East drive 8th level parallel reef has been extended for 205 feet, averaging 6·26 dwts. over a width of 6 feet, which is equal to previous average for this section and proves that reef is extending further East than in any of the upper levels. Drive is still in reef and now showing visible gold. Stop. Winze from 8th level to No. 9 level sunk in section of main reef beyond the fault is now down 94 feet, average assay value 28½ dwts. over 52½ inches, last 5 feet assays 33 dwts. over 55 inches. Stop. I consider position encouraging; no cause for anxiety.'

* * * *

Certainly the most important statement made by Mr. George Mitchell, M.L.C., at the annual meeting of the Rhodesia Chamber of Mines was that relating to development work and ore reserves. Mr. Mitchell said development had progressed at a rate surpassing anything that had previously been attempted in the territory. A reliable estimate of the ore reserves prepared by the Chamber showed that the developed payable ore in sight at the present time was no less than 6,280,908 tons, containing gold to the value of £13,019,226, or sufficient to maintain the present output for a period of five and a half years. No mines belonging to small workers were included in the foregoing estimate, though this class of mine was responsible for 26 per cent. of the output. The figures relating to the industry were, he said, such as to show there was going to be no diminution in the activity of the industry. An early or marked rise in the gold yield of the territory was not, he said, expected at the moment, but it was evident that with developments now proceeding on all sides, with the prospect of better conditions in the labour market, and with the projected railway extensions, the day of very largely increased gold declarations was approaching.

* * * *

The Hanover, Teutonic, and other claims, the properties of the Hanover G.M. Syndicate, were officially taken over by the Goldfields Rhodesian Development Company, in terms of a twelve months' working option, on the 15th ult. The present and former owners of these properties worked them very successfully in a small way, and it is to be hoped that the larger scale of work now laid out by the Goldfields Company will result in attention once again being called to the Filabusi district generally, which has been more or less under a cloud since the closing down of the ill-fated Killarney-Hibernia mine.

* * * *

The following are the development figures at the Globe and Phœnix for the month of January:—Main shaft has been advanced 21 feet; 17th level east portion No. 3 A raise north 17th-16th level, has advanced 17 feet, average width of reef 13 ins., average value over a stoping width of 30 ins. 1 dwt.; 17th level, east portion, No. 3 A winze north, 17th to 19th levels has advanced 16 ft., average width of reef 8 ins., average value over a stoping width of 30 ins. 6 dwts.; 18th level drive south from 2 A winze, east reef, has advanced 75 ft., average width of reef 23 ins., average value oves a stoping width of 30 ins. 59 dwts.; 18th level drive north west reef, has advanced 93 feet, average width of reef 21 ins., average value over a stoping width of 30 ins. 30 dwts.; 18th level No. 1 A winze north has advanced 21 ft., average width of reef 10 ins., average value over a stoping width of 30 ins. 9 dwts.; 19th level, drive north from 1 A winze, east portion, has advanced 12 ft., average width of reef 7 ins., average value over a stoping width of 30 ins. nil. 19th level drive south from 1 A winze east portion has advanced 7 ft., average width of reef 10 ins., average value over a stoping width of 30 ins. nil; cross-cutting for the month 13 ft.

* * * *

Mr. P. S. Triggs, who is well known throughout Rhodesia chiefly in connection with the famous Eileen Alannah mine near Gatooma, is now actively engaged in exploiting certain mining properties in Matabeleland. The Planet, Etoille, and Meteor are three adjoining blocks of ground near the Old Nick Mine, which have recently been acquired on option by Mr. J. Sinclair Ross, on behalf of Mr. P. S. Triggs, from Mr. Huntley. Mr. Huntley has been developing the claims for some considerable time with very satisfactory results, and we understand that the purchase price is one that speaks well for the prospects of the Bulawayo district as a gold producer. There are three separate reefs on the property, and the strike extends for about half a mile. Some of the largest ancient workings in the country led to the opening up of the property, and from the commencement high values were obtained. Several shafts have been sunk, and have reached from 50 to 150 feet. In the latter shaft the reef appears to be opening out. Some of the assays are said to be phenomenal, but sufficient work has not been done to strike a fair average. For the present, therefore, it may simply be said that, eliminating high values, the average promises to come out at one or two ounces per ton. A policy of vigorous development will be adopted. It is also understood that Mr. Triggs has also taken up two properties in the Bembesi district, and these will be vigorously developed.

* * * *

The following extracts are taken from the report of the Jumbo G.M. Company for three months ended December 31st:—Driven, sunk, and risen, 875 ft.; ore developed at October 1st, 26,057 tons, average value 9·87 dwts.; excess tonnage in stopes and development rock taken in, 1,569 tons—27,626 tons; ore crushed October 1st to December 31st, 10,340 tons; ore reserves at December 31st, 17.286 tons, average value 9·78 dwts.; yield from mill and retreatment, 3,962 ozs.; yield per ton treated, 7·664 dwts. Cost per ton crushed, £1 6s. 8·154d.; debenture interest, directors' fees, and general expenses (£814 4s.) 1s. 6·898d. per ton. Profit (£2,249) 4s. 4·192d. per ton. Capital expenditure, £2,383.

* * * *

Mr. Campbell, who recently struck a phenomenally rich pocket of gold on the Newery claims near the Old Nic, is still following up the contact where the gold occurs, and this week brought in another splendid lot of specimens which are being exhibited in Messrs. Basch's window in

Bulawayo. It is nuggetty and coarse gold similar to the original find. Mr. Campbell only took up the claims a few months ago. His predecessors had sunk a shaft, but met with no success. Mr. Campbell, working on the theory that they had been working on the wrong side of the ore body—a banded ironstone—opened the ground on the other side, where the ironstone was separated by a few inches of sandstone from decomposed granite. A vein of ironstone at this point—almost metallic in appearance—he found to carry gold, and, following it down, it rapidly increased in value to about 15 dwts. At a depth of 23 ft., blasting on the footwall, against the granite, he found, according to Bulawayo advices, he had been drilling into a more or less solid mass of gold.

Rhodesia Chamber of Mines.

QUESTIONS AT ISSUE.

The report of the Executive Committee for the month of January states :—

Report of the Native Affairs Committee.

At the request of the Government the committee have considered the following paragraphs in the Report of the Native Affairs Committee :—

Payment for Drilling.—It has been pointed out that payment of a minimum wage for the first 30 days' work, irrespective of the amount of drilling performed, is now provided for in all contracts made by the Rhodesian Native Labour Bureau.

Payment of Wages Monthly Irrespective of Amount Earned.—The committee have expressed the opinion that the suggestion that payment of natives at the end of each calendar month would not be of any material benefit to employer or labourer, as there would be no inducement to the labourer to complete his 30-day contract in the shortest possible time. This would lead to a larger number of natives being required on a mine to supply the daily requirements. Moreover, the proposal constitutes a departure from the principle laid down in the Masters and Servants Ordinance Amendment Ordinance, 1909, Section 3, which deals with the subject of 30-day tickets and payment therefor, and which appears to be understood by native labourers, and to operate well in practice.

Misunderstanding as to Contracts.—The committee have expressed the view that misunderstandings as to the terms of a contract are not likely to arise in view of the safeguards provided by the Native Labour Regulations Ordinance, which has recently been passed by the Legislative Council, and which provides for the registration of all contracts.

Supervision of Labour.—The committee have inquired whether any further steps are required apart from those provided for at the present time under the Mines and Works Regulations for the detection of cases of sickness, the diminution of loafing, etc. Section 10 (5) of the Government Notice No. 350 of 1911 lays down that absence of a native from attendance at daily shift shall be inquired into, and necessary steps taken should it be found that such absence is due to sickness.

Compensation to Natives.—It has been pointed out that a system of voluntary compensation for accidents is at present in force, while Bureau contracts include a compulsory scale of compensation for death and disablement as the result of accidents, and for disablement as the result of disease contracted on mines.

Excess Areas.

The committee were informed that it had been decided by the Government that as there appeared to be a certain doubt as to the interpretation of the sections in the Mining Law relating to excess areas, it has been decided to have the matter dealt with by the High Court in the form of a special case. The committee pointed out to the Government that in the meantime inspections were being demanded of, and paid by claimholders uninformed as to the position, and represented that claims for inspections on excess areas should be provisionally withdrawn pending the decision of the High Court. This was acceded to by the Government. Negotiations are still being carried on with the Government with a view to attaining a compromise on the matter which will be equitable to claimholders, and at the same time avoid the necessity of the proposed test case.

Mining Rights After 1913.

The committee have addressed the Government, pointing out that under Section 26 of the Mines and Minerals Ordinance Amendment Ordinance, 1907, the provisions of that Ordinance in regard to payment of Royalty and Inspections will not apply to reef claims pegged after 31st December, 1913. The Government has been asked that ample time shall be given for the consideration of its proposals in regard to the modificaton of perpetuation of the terms for working for profit laid down in that Ordinance.

Movement of Slaughter Cattle.

The committee have represented to the Government the necessity for some relaxation in the restrictions imposed upon the movement of cattle intended purely for slaughter purposes, in districts where East Coast fever is known not to exist. The restrictions referred to are in some cases seriously interfering with the arrangements of mine-owners to carry out the diet regulations.

Membership.

The Eileen Alannah Mining Company, Limited, represented by Mr. W. G. Swanson, has joined the Chamber.

Changes in Representation.

The following have been notified :—Charterland and General Exploration and Finance Company, Ltd. : Mr. N. H. Griffin for Mr. W. H. Peard. Matabele Queen's Company, Ltd. : Major M. Heany for Mr. W. G. Swanson.

General.

Amongst other subjects which have received the attention of the committee during the month are : Status of Mine Surveyors ; Rail Rates on Mealies ; Price of Wankie Coal ; Telephone Service ; Labour Tax, etc.

Main Reef West.

The report for the quarter ended the 31st December, 1911, states : 120 stamps (80 ran), 2 tube mills, and cyanide works ; milled 43,284 tons. Expenditure.—Mining expenses, £25,091 13s. 8d., cost per ton, 11s. 7.128d. ; develipment, £8,678 18s. 7d., cost per ton 4s. 0.123d. ; tramming, sorting and crushing, £1,168 16s. 8d., cost per ton, 6.481d. ; milling, £5,338 5s. 1d., cost per ton, 2s. 5.599d. ; cyaniding, £4,221 2s. 4d., cost per ton, 1s. 11.405d. ; mine charges, £764 2s. 7d., cost per ton, 4.237d. ; general charges, £2,667 4s., cost per ton, 1s. 2.789d. Total working costs, £47,930 2s. 11d., cost per ton, 22s. 1.762d. Profit for quarter, £23,395 11s. 6d., cost per ton, 10s. 9.723d. Revenue, £71,325 14s. 5d., cost per ton, 32s. 11.485d. No allowance has been made in the above statement for interest on debentures, or for the Government tax on profits. On the 13th of December, 1911, dividend No. 5 of 7½ per cent. (1s. 6d. per share) was declared for the six months ending 31st December, 1911, payable to shareholders registered on 31st December, 1911. Capital Expenditure.—The capital expenditure was as follows : Shafts, £10,638 6s. 8d. ; buildings, machinery and plant, £15,207 6s. 2d. ; total, £25,845 12s. 10d. Milling.—Stamps running, 80 ; time run, 74.65 days ; two tube mills ran 82.68 days ; tons crushed, 43.284d. ; duty per stamp per day, 7.248 tons ; yield in fine gold, 12,734.226 ozs. ; yield per ton crushed in fine gold, 5.884 dwts. Cyaniding (sands and slimes).—Sands treated, 24,264 tons ; slimes treated, 19,020 tons ; yield in fine gold, 4,343.217 ozs. ; yield per ton crushed in fine gold, 2.007 dwts. ; cost per ton treated, 1s. 11.405d. ; recovered from all sources employed per ton milled (fine gold), 7.891 dwts. Development—Feet driven, risen and sunk for the quarter, 2,717½ feet. Assay Value.—Of 2,279½ feet driven, risen and sunk on Main Reef Leader, 2,058 feet were on reef, averaging 5.9 dwts. over 48 inches. 38 feet were driven on South Reef of an average value of 2.3 dwts. over 36 inches. Shaft sinking, west shaft—251 feet have been sunk and timbered in this shaft, making a total depth to date of 2,469 feet. Payable ore reserves, September 30th, 1911, 640,206 tons ; ore developed for quarter, 81,156 tons—total, 721,362 tons. Less ore mined for quarter, 50,910 tons ; less difference in stoping width, 438 tons—total, 50,472 tins ; payable ore reseres as at December 31st, 1911, 670,890 tons. Ore mined for the quarter, 50,910 tons ; less waste sortedout (15.78 per cent.), 7,676 tons—total, 43,234 tons ; difference in bins, 50 tons ; ore milled for the quarter, 43,284 tons. The erection of the steel bins and crusber station at No. 5 shaft is making satisfactory progress. The alterations to the mill bins to enable them to carry the heavier trucks and locomotive is well under way.

E. J. MOYNIHAN,

CONSULTING ENGINEER.

PLANS, SPECIFICATIONS, REPORTS AND ADVICE, MINING
EQUIPMENT, STRUCTURAL WORK AND
FINANCIAL ADVICE.

10, ANGLO-AUSTRIAN BUILDINGS. Box 2061.

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RHODESIA'S "SMALL MINES."

Last Year's Contribution 26 per cent. of the Total Output—Some Interesting Statistics.

ALTHOUGH large numbers of the so-called small mines of Southern Rhodesia, which have earned undying fame for Matabeleland and Mashonaland, are now embraced by the larger corporations and companies of the country, it must not be supposed that the small mine movement—the endeavour on the part of small syndicates, lessees, tributors, and working owners to acquire and operate mining properties at a profit—has appreciably weakened or lost ground during the last year or two. The names of several famous miniature mines, as they were termed, have changed somewhat with a change of ownership. The Eileen Alannah, the Lonely, the Buck's Reef, the Cam and the Motor are still known by their familiar and long-established titles, but the letters G.M. Co. and Ltd. figure after them. Such concerns, although now controlled from head offices in Bulawayo, Salisbury, Johannesburg, and London, will for all time be associated with names like Wood, the Campions, and Triggs—hardy pioneers who succeeded where in the first instance the large company failed.

THE PART OF THE PROSPECTOR.

To-day the tributors and lessees are producing about 26 per cent. of the gold output of the country. Additional discoveries are being continually made in nearly every district of Matabeleland and Mashonaland, and in the great majority of instances it is the agent of the small syndicate or the prospector on his own account, and not the agents of large corporations, who are making these additions to the known gold deposits of Southern Rhodesia. Just at present the rainy season militates somewhat against prospecting in the fields lying at some distance from the railway, but it would appear that next winter a number of new and miniature concerns will figure on the tributors' and lessees' lists of producers as a result of the exploratory work carried out during the past few months.

LAST YEAR'S SOURCES OF YIELD.

Speaking at the annual meeting of the Rhodesia Chamber of Mines, held the other day, Mr. Geo. Mitchell, who presided, said the analysis of gold production for the year is as follows:—Companies operating own claims, 1,122,341 tons, 464,859 ozs., £1,960,271, equal to 74 per cent. Tributors of companies' claims, 274,734 tons, 77,415 ozs., £325,413, equal to 12 per cent. Small syndicates and individual workers, 206,403 tons, 86,248 ozs., £362,212. or 14 per cent.

PRODUCTION ACCORDING TO DISTRICTS.

It will here be of interest to record the productions of the more important small mines of the country, according to districts. The following figures deal with the outputs, etc., of concerns declaring returns in respect of the December operations:—

Mine.	Stamps or other Mills.	Output.	Owners.	Lessees or Tributors.
		£		
BULAWAYO DISTRICT—				
Agincourt	5	914	—	—
Alice & Anderson's	10	498	Willoughby's Cons.	Tributors.
Blanket	—	376	Willoughby's Cons.	Tributors.
C.	5 and I Chilian	1,877	—	D. & C. Syndicate, Lessees.
Charles	4	1.107	—	W. J. Cooper. Lessee.
Matabele No. 3 ..	5	3.037	R. M. Nairn.	—
New Eclipse ..	4	1,170	J. R. Stewart.	—
North & Hanover ..	5	491	—	Hanover Synd. Lessees.
Queen's W. Ext. ..	3	724	Willoughby's Cons.	Tributors.
Rose 2. W. ..	5	808	Derry & Tucker.	—
Tuff Nut	5	1,697	King's Syndicate.	—
GWELO DISTRICT—				
Arizona No. 2 ..	5	596	—	A. J. Marchant, Lessee.
Broad Arrow ..	10	563	Willoughby's Cons.	Broad Arrow Synd., Tribs.
Csardas	10	1,624	Wolfshall Synd.	—
Murray	—	101	Amal. Props. of Rhodesia.	Tributors.
North Bonsor ..	15	1,162	Willoughby's Cons.	Tributors.
MASHONALAND—HARTLEY—				
Amaroso	5	528	—	C. H. Wheildon, Lessee.
Battlefields (R.) Ltd.	5 and 2 Chilians.	3,293	—	I. J. Minaar & D. McArthur, Lessees.
Blue Rock ..	2	655	—	Ellsmoor & Goodyer, Lessees.
Brilliant	5	1,551	—	Mabel's Luck Synd., Lessees
Concession and W. Extension.	5 and 1 Chilian, 2 Pans.	2,652	Mashonaland Agency.	Tributors.
Crown No. 2 ..	2	430	—	Crown Synd., Lessees.
Dalny	5	665	Rhod. Expl. & Dev. Co.	Tributors.
Glencairn No. 3 ..	4	2,743	—	Glenrosa Synd., Lessees.
Golden Valley ..	5	890	—	J. Mack, Lessee.
Goodsman	2	886	—	W. M. James, Lessee.
Heathfield	5	429	—	D. M. McBarnet, Lessee.
Owl	5 and I Hunt'g'n	2,886	Rhods. Expl. & Dev. Co.	Tributors.
Pickstone & I. W.	4	722	—	S. L. Syndicate, Lessees.
Rouge I.N. ..	5	956	—	S. Rhod. M. Synd., Ltd.
Shepherds	5	1,213	—	Phœnician Synd., Lessees
Washington ..	5	1,378	—	I. J. Minaar, Lessee.
LOMAGUNDI—				
Broken Hill ..	I Pneumatic	380	—	Sceptre Synd., Lessees.
MAZOE AND SALISBURY—				
Mickey	2	497	—	B. G. Byerley, Lessee.
Mont d'Or	1 Dolly	461	—	Claxton and Bussell, Lessees.
Old Loyalty ..	5	—	—	—
UMTALI AND VICTORIA—				
Liverpool	5	470	Amal. Props. of Rhod.	Tributors.
Rezende I.W.A. ..	10	1,643	—	Imbeza Synd., Lessees.
Umtali	10	711	—	Umtali Waterfall Synd., Lessees.

RAND MINES' SUBSIDIARIES: A QUARTER'S RESULTS.

The following is a tabulated summary of the working operations of certain of the companies in which the Rand Mines, Ltd., holds shares for the financial quarters ending 30th September, 31st October and 31st December, 1911:—

	Rose Deep, Limited.	Geldenhuis Deep, Limited.	Ferreira Deep, Ltd.	Crown Mines, Limited.	Durban Roodepoort Deep, Ltd.	New Modderfontein G.M. Co., Ltd.	City Deep, Limited.	Village Deep, Limited.	Bantjes Cons. Mines, Ltd.	Modderfontein B. Gold Mines Ltd.	Nourse Mines, Ltd.	The Wolhuter Gold Mines, Limited.	The Village Main Reef G.M. Co., Ltd.	Jupiter G.M. Co., Ltd.	Main Reef West, Limited.	East Rand Proprietary Mines, Ltd.
FINANCIAL QUARTER ENDING.. ..	December 31, 1911.										October 31, 1911.		September 30, 1911.			
Mine																
DEVELOPMENT WORK— No. of feet driven, sunk and risen, exclusive of Stopes	3,410	9,630	2,253	16,806	5,333	6,548	3,407	6,903	3,413	75	6,869	2,640	1,350	2,638	3,398	12,167
MAIN REEF—																
Distance exposed (feet)	1,004	2,551	92	980	2,477	4,097	—	—	—	27	1,121	—	—	—	—	
Width (inches)	29	20	8	34	22	10	—	—	—	12	24	—	—	—	—	
Assay Value (dwts.)	9·7	8·5	3·0	3·6	12·7	43·5	—	—	—	24·7	10·4	—	—	—	—	
MAIN REEF LEADER—																
Distance exposed (feet)	1,053	3,845	762	4,325	—	—	2,149	1,699	120	—	712	—	255	—	1,405	21
Width (inches)	17	8	27	30	—	—	25	31	31	—	11	—	10	—	48	
Assay Value (dwts.)	11·1	21·2	18·1	16·5	—	—	19·3	13·5	11·1	—	29·0	—	29·4	—	5·8	9·9
SOUTH REEF—																
Distance exposed (feet)	896	1,635	711	3,896	2,098	—	104	1,564	1,685	—	1,230	—	651	—	65	
Width (inches)	15	13	19	26	21	—	36	20	11	—	14	—	16	—	36	
Assay Value (dwts.)	10·8	10·8	23·6	14·6	25·5	—	6·7	13·1	19·3	—	15·5	—	29·0	—	3·9	
STOPING— Tonnage Stoped, including Ore from development faces	214,049	227,635	109,902	492,408	82,818	176,189	86,570	168,022	83,981	86,568	169,201	118,746	116,996	—	53,324	603,175
Milling																
Ore received from Mine (tons) ..	214,049	227,635	109,902	492,408	82.818	176,189	86,570	168,022	83,981	86.568	169,201	118,746	146,996	—	53,324	603,175
Ore Milled (tons)	186,400	189,370	91,020	424,200	69,980	156,200	116,730	146,600	72,045	77,960	142,350	89,750	121,300	79,500	45,090	574,001
Cyaniding																
Tons treated	186,996	189,920	92,520	423,560	69,335	155,496	117,490	145,563	71,750	59,360	143,545	89,750	119,498	79,500	45,090	—
Gold Production																
Total Yield per Ton Milled (dwts. fine)	6·71	6·58	10·44	8·23	6·79	7·28	7·41	6·65	7·06	7·93	7·37	6·41	8·93	5·31	7·92	—
Working Expenses																
Cost	£163,529	£214,159	£ 99,895	£406,911	£79,829	£135,856	£131,429	£137,822	£90,436	£81,009	£167,866	£74,913	£110,912	£81,855	£48,685	£479,624
Cost per Ton Milled	£0 17 6	£1 2 8	£1 2 0	£0 19 2	£1 2 9	£0 17 5	£1 2 7	£0 18 10	£1 5 1	£1 0 10	£1 3 7	£0 16 8	£0 18 3	£1 0 7	£1 1 7	£0 16 9
Revenue																
Value of Gold produced	£262,655	£261,082	£199,401	£732,330	£99,559	£238,693	£181,269	£204,467	£106,654	£129,818	£220,321	£120,368	£227,077	£88,312	£74,738	£679,870
Value per Ton Milled	£1 8 2	£1 7 7	£2 3 10	£1 14 6	£1 8 5	£1 10 7	£1 11 1	£1 7 11	£1 9 7	£1 13 4	£1 10 11	£1 6 10	£1 17 5	£1 2 3	£1 13 2	£1 3 8
Working Profit																
Amount	£99,126	£46,922	£ 99,505	£325,388	£19,730	£102,837	£49,840	£66,645	£16,218	£48,809	£52,454	£45,454	£116,165	£6,457	£26,053	£200,216
Per Ton Milled	£0 10 8	£0 4 11	£1 1 10	£0 15 4	£0 5 8	£0 13 2	£0 8 6	£0 9 1	£0 4 6	£0 12 6	£0 7 4	£0 10 2	£0 19 2	£0 1 7	£0 11 7	£0 7 0
Net Revenue from Other Sources—																
Debit	£1,651	—	£633	—	£333	—	—	—	—	£891	—	—	—	—	—	—
Credit	—	• £1,495	—	• £1,200	—	• £3,960	• £1,462	£1,324	£1,400	—	• £119	—	—	£1,388	—	—
Net Profit	£97,474	£51,418	£98,872	£326,589	£19,396	£106,798	£51,302	£67,969	£17,619	£17,917	£52,574	—	—	£7,845	—	—
Estimated Amount of 10 p.c. Tax on Profits	£9,258	£3,727	£9,123	£32,036	£1,319	£10,660	£4,372	£7,133	£1,469	£5,800	£4,374	—	£10,136	—	—	—
Reserve Gold—(ozs. fine gold) ..	6,127	1,580	—	4,824	218	10,629	—	5,600	660	3,709	251	3,698	5,774	—	—	8,266
Capital Expenditure	£5,822	† £7,396	£2,012	† £116,082	£5,735	† £35,558	† £17,696	† £12,243	‡ £977	£48,264	£12,531	£4,231	£257	£10,892	£13,238	£40,839
Interim Dividends Declared—																
Payable to Shareholders registered on books as at	Dec. 30, '11	Dec. 30, '11	—	Dec. 30, '11	Dec. 30, '11	Dec. 30, '11	—	Dec. 30, '11	—	—	—	Oct. 31, '11	—	—	—	—
Rate per cent.	20 per cent.	12½ per cent	—	55 per cent.	5 per cent.	12½ per cent	—	5 per cent.	—	—	—	7½ per cent.	—	—	—	—
Total amount of distribution ..	£140,000	£73,219	—	£517,058	£22,000	£175,000	—	£53,033	—	—	—	£64,500	—	—	—	—

* Including Accumulations.

† Exclusive of the proportion of an annuity payable to the Government in respect of mining rights acquired under certain claims.

‡ Credit.

THE CASE FOR A SANE FISCAL POLICY.

Points from Mr. W. A. Martin's Minority Report—Protective Duties Inimical to Best Interests of Country—" The People have not been Consulted."

The minority report of Mr. W. A. Martin regarding the condition of trade and industries is summarised in his conclusions upon the far-reaching and radical effects of the alterations advocated by the Majority Report. " Whilst," he says, " the cost of living is so high—especially that of the white man with a family—the development of the country must necessarily be retarded. It is certain that no material reduction can be effected so long as the necessaries of life are heavily taxed as at present. The first consideration, therefore, should be a substantial cheapening of foodstuffs and other necessaries by the removal therefrom of all Customs duties. This would undoubtedly result in a reduction in the cost of production, thereby enabling manufacture to be carried on more cheaply, and thus increasing the opportunities for labour. The extension of the list of raw materials for manufacturing purposes to be admitted free of duty or at the 3 per cent. tariff, and particularly the reduction in railway rates on raw materials, would also immensely assist local industries in their competition against the imported article. Indeed, those manufacturing industries which under the present tariff do not enjoy special protection would be much better off than they are at present, and with perhaps two or three exceptions the industries whose protection under the present tariff it is proposed should be reduced would benefit to a greater extent than they would suffer.

The Alternatives.

" The alternatives before the country appear to be a continuance of the present Customs tariff, which satisfies nobody and which unquestionably imposes heavy burdens upon the people; or substantial increases in the protective duties. The incidence of the duties under the present tariff has already been dealt with in this report, and need not be further referred to. The witnesses who gave evidence on behalf of the South African Manufacturers' Association advocated increases of duty on most articles at present being manufactured in the Union, and the rates of duty, generally speaking, which were advocated and stated as likely to be sufficient to enable the local manufacturers to secure the supply of the market were in no case more and in most cases less than the rate of duty in force in Australia, Canada, or New Zealand. The rates of pay for skilled labour in all these countries are very much lower than in any part of South Africa in so far as white labour is concerned, and if Australia, with white skilled labour at 8s. or 9s. per day, finds it necessary to impose a protective duty of, say, 30 per cent. to enable her factories to compete against the oversea manufacturer, it is obvious that the South African manufacturer, who has to pay from 14s. to 20s. per day for similar labour, will be unable to do so unless either a very much higher rate of protection is granted or coloured or native labour at low rates is employed.

People Not Consulted.

" It may be accepted as certain that if all the present demands of the Manufacturers' Association were granted they would in a very short time be discovered to be insufficient, and application for additional protection would be made, backed up by the plea that capital had been invested on the strength of the protection already accorded, and that failing further assistance under the tariff it would be lost. Up to the present the people of South Africa have not been consulted as to whether or not they favour an out-and-out protective policy. Hitherto the Customs tariffs have been a matter of negotiation between a few delegates from each of the colonies now forming the Union, and the findings of the Convention thus constituted have had to be accepted or rejected en bloc. It is of supreme importance that at the outset of her career as a Union South Africa should lay down the conditions for her development on lines which are economically sound, and which particularly have regard to her exceptional circumstances in respect of population of different races and in various stages of civilisation. If it is found that in the peculiar circumstances in which Customs tariffs have been settled prior to Union industries have grown up and the continuance of the protection accorded cannot be justified either from a national or from an economic point of view, it would surely be wise to withdraw the protection, even at the cost of compensation.

Drain on Resources.

" There is, of course, no legal obligation to pay compensation in such circumstances. The point is that in many cases, such as the sugar and match industries, it would be ' good business ' to do so rather than continue the present or any other conditions imposing so great a drain on the resources of the people, and so serious an incubus on the development of other industries. The finding of the money required for the purpose of compensation would be a simple matter; it would only be necessary to continue the existing duties on the imported article and the imposition of an excise duty of an equal amount for the time necessary to raise such amount as was considered by the Government fair and equitable by way of compensation. The duty and excise could thereafter be continued for revenue purposes or abandoned. In the meantime, in justice to manufacturers using large quantities of sugar, a rebate of the duty paid thereon could be given, as was formerly done in the Cape Colony. The adoption of this course would delay the benefit derivable from the reduction in the cost of the articles concerned, but the enormous economic saving which would ultimately be effected would be ample justification. In conclusion, I may say that I have very carefully considered the subjects referred to the Commission in the light of such statistical and other information as is available. I have given special attention to the peculiar conditions of South Africa in respect of the backward state of agriculture and the presence of the several races of varying degree in skill and civilisation.

The Only Way.

" I have endeavoured to trace effects back to their causes, and in my judgment the recommendations I have made provide the only way in which (1) the primary industries of the country can be developed to their fullest extent; (2) the cost of living can be materially reduced; (3) the farmers will be able to compete in the markets of the world; (4) white labour can maintain or improve its position in competition with coloured or native labour; (5) secondary industries suitable to the country can be developed on economic lines."

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TECHNICAL EDUCATION FOR THE MINER.

Merits of the Correspondence Method— How to Lessen Accidents and Increase Efficiency.

The recent discussions on accidents in mines have brought one point very forcibly to the front, and that is, the scarcity of efficient miners on the Rand. It has been stated on sufficiently good authority that only 15 per cent. of the white miners can really be called efficient. This may be slightly exaggerated, but in any case it is a fact that the great majority of miners are endangering, not only their own lives, but the lives of thousands of others, by their ignorance. It has been thought, apparently, an impossibility to educate technically this vast percentage, simply because the classes held by the School of Mines have not been an unqualified success, and the idea has been brushed aside without very much thought having been given to it. It is agreed that the subject of technical education among the workers on the Reef is a subject of vital importance to the community at large, and clearly it is the duty of the mining houses to foster in every way possible some satisfactory system for the technical training of their employees. It has been proved unsatisfactory to place young college graduates, with little or no practical experience, in positions of responsibility, and the aim should be to give technical training to those who have already the practical experience. Class instruction is handicapped from the very start by a variety of causes, such as the shift system, the difficulty of reaching the centre in which the class is to be held, the natural dislike for a grown man to sit in the same class with perhaps an apprentice from the same property and numerous other reasons which space does not permit of quoting, but which are familiar to all those who have taken the trouble to go into the matter. Tuition by an expert private tutor or coach is beyond the means of the average man, and need not be taken into consideration.

Now it would seem that the problem of training the 85 per cent. of inefficients is impossible of solution, but the reverse is the case. There *is* a means, a means whereby any man can obtain in his own home, his own time, and at small expense, a specialised course of training which will effectually educate him in those scientific principles of his work and render him a far more valuable man to himself and his employers. There is, in short, the International Correspondence Schools and their courses of instruction. Here is a means at the disposal of every man who is anxious to perfect himself in his chosen profession or trade. That this statement is well founded is proved by the fact that at the present time no fewer than 160,000 ambitious people in the British Empire are making themselves more efficient by means of this unique organisation and system, and in South Africa, in spite of the small population, there are over 7,000 I.C.S. students.

The courses of the I.C.S. are carefully prepared by experts in every line, the text-books are expressly written for home study, and are specially illustrated by the School's staff of illustrators. These text-books are issued, in the first place, to students in pamphlet form, termed Instruction Papers, and consequently there is no danger of any portion of a course being out of date, as it is merely necessary to revise the particular paper affected by the rapid strides made in the application of science to industry. No less than £50,000 is expended annually on revision alone. The student's work is most carefully corrected, and unless he obtains 90 per cent. of the possible marks he is invariably required to revise certain portions of his paper before the subject certificate is granted to him. This absolutely prevents anyone obtaining the Diploma granted by the Schools unless he has thoroughly studied and mastered the contents of every one of his Instruction Papers. It is impossible in a short article to deal adequately with an institution like the International Correspondence Schools, and it must not be thought that its courses are solely on Mining. There are no fewer than 150 courses, covering a wide range of subjects, from Agriculture to Aviation, and, in passing, we would mention that the Schools have just issued a set of papers on Co-ordinate Surveying, which, we believe, to be the only complete instruction on this subject in print.

Enough has been said to prove that this great problem of technical education is not, by any means, incapable of solution, and every man who realises the necessity of improving his technical knowledge would do well to make inquiries of the I.C.S., and invite the men in control of the mining industry on the Rand to-day to support this excellent movement for improving the efficiency of the white labour force.

Consolidated Main Reef.

The report for the quarter ended 31st December, 1911, states: 120 stamps (86.67 ran), 3 tube mills, and cyanide works; milled, 51.179 tons, Expenditure.—Mining expenses, £24,872 6s. 8d., cost per ton, 9s. 8.637d.; development, £12,320 13s. 2d., cost per ton, 4s. 9.777d.; pumping, £2,234 6s. 3d., cost per ton, 10.477d.; tramming, sorting and crushing, £2,419 1s. 1d., cost per ton, 11.344d.; milling, £5,235 10s. 7d., cost per ton, 2s. 0.552d.; cyaniding, £4,838 16s., cost per ton, 1s. 10.691d.; mine charges, £1,963 10s., cost per ton, 9.208d.; general charges, £3,487 9s. 3d., cost per ton, 1s. 4.354d.; total working costs, £57,371 13s., cost per ton, 22s. 5.010d.; profit for quarter, £19,815 8s. 5d., cost per ton, 7s. 8.923d. Revenue, £77,187 1s. 5d., cost per ton, 30s. 1.963d. No allowance has been made in the above statement for the Government tax on profit. On the 13th December, 1911, dividend No. 7 of 3¾ per cent. (9d. per share) was declared for the six months ending 31st December, 1911, payable to shareholders registered on 31st December, 1911. The capital expenditure was as follows:—Shaft £8,939 0s. 5d.; buildings, machinery and plant, £8,148 10s.; total, £17,087 10s. 5d. Milling.—Stamps running, 86.67; time run, 79.50 days; 2.33 tube mills ran, 77.67 days; tons crushed, 51.179; duty per stamp per day, 7.428 tons; yield in fine gold, 14,035.976 ozs.; yield in fine gold per ton crushed, 5.485 dwts. Cyaniding (sands and slimes).—Sands treated, 25,620 tons; slimes treated, 25,559 tons; yield in fine gold, 4,453.319 ozs.; yield in fine gold per ton crushed, 1.740 dwts.; cost per ton treated, 1s. 10.691d. Recovered from all sources employed per ton milled (fine gold), 7.225 dwts. Development.—Feet driven, sunk and risen in western section, 3,192; ditto in eastern section, 1,329; total footage for the quarter, 4,251 feet. Ore Reserves.—Ore reserves, September 30th, 1911, payable, 549,630 tons; ore developed for quarter, payable, 82,860 tons, unpayable, 31,020 tons; total, payable, 632,490 tons. Less ore mined for quarter, 56,698 tons, less difference in stoping width and Main Reef mined, but not shown in reserves, and from stopes previously called unpayable, 5,858 tons, payable 51,040 tons; ore reserves, December 31st, 1911, payable 581,450 tons. Mining.—Ore mined for the quarter, 56,898 tons; less waste sorted out (10.17 per cent.), 5.798 tons; total 51.109 tons; difference in bins, 70 tons; ore milled for the quarter, 51,179 tons. 168 feet have been sunk and timbered in this shaft, making a total depth to date of 1,271 feet. Sinking has been hindered owing to the continued scarcity of native labour. The Babcock and Wilcox mechanical stokers are being erected at the mill boiler plant; four out of the eleven boilers are now steaming with these and giving full satisfaction.

Situations Wanted.

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THE WEEK IN THE SHAREMARKET.

Firmer and Better—Healthier Tone—Improving Outlook.

No doubt the size of the bear account is primarily responsible for the firmness of the market. Certainly the outlook in Europe is not bright, and locally there is no indication of activity. The fact remains that the whole tone has improved, and, given a little luck, Rand stocks might easily re-attract some interest. Apart from some firmness in Rooibergs, tin stocks have been quiet, and diamonds are seldom enquired for locally. The week's changes are shown below:—

	Friday, 1st.	Sat., 2nd.	Monday, 4th	Tuesday, 5th.	Wed., 6th.	Thurs. 7th.
African Farms ..	14 6	14 0B	14 6B	14 6B	14 6	14 6B
Aurora West ...	7 6B	7 6B	..	8 0S	8 0	..
Apex Mines ...	...	23 0B	...	23 0S	23 0B	23 2B
Bantjes Consolidated	24 0	24 0	23 9	23 9B	23 6B	23 9B
Benonis	5 0B	6 3B	6 3B	6 6	6 3	6 6B
Blaauwbosch ...	15 0S	10 0	...	.	..	..
Bushveld Tins ...	0 7B	0 8B	..	0 8B	0 7B	0 8
Brakpan Mines ...	55 6B	57 0B	57 0	...	...	57 0B
City and Suburban ...	49 6B	49 6B	49 9B	49 6B	49 6B	49 6B
City Deeps	47 6B	48 3B	47 0B	48 0B	48 0B	49 6B
Cloverfield Mines ...	4 1B	4 0B	4 1B	4 2B	4 2	4 2B
Cons. Langlaagtes ...	18 9B	18 9B	18 9	19 0B	19 0B	19 3
Cons. Main Reefs ...	18 3	18 3B	18 0B	18 3	18 4	18 6
Clydesdales	10 0B	10 0B	...	10 0B	...	10 0B
Coronation Freeholds	0 7B	0 7B	0 6B	0 3B	0 8	-
Con. Investment ..	20 0B	20 3B	...	...	...	21 0
Concrete Cons. ...	...	10 0B	10 0B	...	10 0B	...
East Rand Cent. ...	7 7B	7 9B	7 6B	7 6B	...	7 9B
East Rand Coals ...	2 4B	2 4B	2 4B	2 5B	2 5	2 4B
East Rand Deeps ...	...	...	...	2 0S	1 8B	...
East Rand Props. ..	52 6	53 6	52 0B	54 0	54 0S	55 0B
East Rand Deb. ...	£91	£91	£91	£91	£90	£92
Eastern Gold Mines	1 8B	1 8B	1 8B	1 10S	1 10S	1 9
Govt. Areas... ...	21 9B	22 0B	22 0B	22 0B	22 0B	22 0B
Glencoe (Natal) Colls.	6 5B	6 5B	6 5B	6 5B	6 5B	6 5B
Glynn's Lydenburgs	30 0B	32 6	...	..	32 6S	32 6S
Glencairns	4 0B	...	3 11B	3 11B	4 0B	...
General Minings ...	..	...	18 0B	18 0B	18 0B	...
Jupiters	10 0B	10 0B	10 3B	10 9	10 6B	11 0
Kaalfontein Diamonds	0 6B	0 7B	0 7B	0 8S	0 6B	0 7B
Klerksdorp Props. ...	3 0	3 0B	3 0B	3 0B	3 0B	3 0B
Knight Centrals ...	13 3B	14 6	14 0B	13 0B	13 9B	13 9B
Knights Deeps ...	...	46 0B	...	...	..	45 0B
Kleinfontein Estates	32 6S	...	32 6S	..	...	32 6S
Lace Props.	3 0B	3 0B	3 0B	3 0B	3 1B	3 0B
Lydenburg Gold Farm	8 6B	8 6B	8 6B	8 6	8 6	8 6B
Main Reef Wests ...	28 0	27 9B	27 9B	27 9B	27 6B	28 3B
Modder B's	51 6B	52 0B	52 0B	51 9B	53 0	51 6B
Midas Deeps ...	1 2B	1 2	1 2B	1 3	1 2B	1 2B
Middelvlei Estates...	1 11B	2 0B	1 11B	2 0B	2 0B	2 0B
Modder Deeps ...	23 0	...	...	23 0	22 6B	...
New Eras	5 9B	5 9B	5 9B	5 10B	6 0	5 9B
New Kleinfonteins	27 6B	28 0S	28 6S	...	28 3B	28 6B
New Rietfonteins ...	11 3B	11 4B	11 0B	11 6B	11 3B	11 3B
New Heriots ..	90 0B	...	.	95 0S	90 0B	...
New Unifieds ...	18 6S	...	19 0S	18 6	19 0S	19 0S
New Boksburgs ...	1 6B	1 6B	1 6B		1 6B	1 6B
Nigels	12 6B	...	..	15 0B	13 3B	15 0B
Orange Diamonds ..	1 9B	1 8B	1 8B	1 9B	1 9B	1 9B
Pretoria Cement Co.	55 0B	55 0	55 0	51 0B	55 0S	55 0S
Princess	...	12 3B	12 0B	...	13 0S	13 0S
Rand Nucleus ..	2 7B	2 10B	2 10B	2 9B	3 1S	...
Randfontein Estates	31 6	31 9B	31 3B	31 8B	32 0	33 0
Rooiberg Minerals	25 6B	27 0	26 3	26 0	26 9S	27 6
Rand Klip	3 9B	...	3 9B	3 9B	3 9B	...
Ryan Nigels ..	4 0B	4 0B	4 0B	4 0B	4 0B	4 0B
Robinson Deeps ...	..	...	53 6S	...	...	...
Rood. Durban Deeps	...	...	23 0B	..	23 6B	24 0B
Rood. U.M.R. ...	19 0S	18 0B	20 0S	...	...	21 0S
Simmer Deeps ...	2 9	...	3 6B	...	3 6B	3 6B
South African Lands	4 0B	4 1B	4 2	4 1B	4 1	4 2

B Buyers. Sellers.

	Friday, 1st.	Sat., 2nd	Monday, 4th.	Tuesday, 5th	Wed., 6th	Thurs. 7th.
S. Randfontein Deeps	4 0B	4 1	3 11	3 10B	4 0	4 0
Sub Nigels	6 3B	6 3B	...	6 0B	6 0B	6 3B
S. A. Breweries ...	38 6S	...	38 0B	40 0S	38 6B	38 6B
Springs Mines ...	...	8 0B	8 0B	...	8 0B	8 0B
Swaziland Tins	...	...	39 0B	...	39 0B	...
Trans. G.M. Estates	41 3B	42 0B	41 0B	42 6	42 6	42 0B
Temple Tins ...	3 0B	3 0B	...	...	...	3 0
Trans. Coal Trusts..	36 9B	..	35 0B	36 6B	36 0B	35 0B
Van Ryn Deeps ...	7 1B	7 1B	7 0B	7 0	7 0B	...
Village Deeps ...	40 0B	40 9B	40 3B	41 0S	40 0B	40 6
Vogel. Cons. Deeps...	1 9B	1 9B	1 9B	1 9B	1 9B	1 10B
Witbank Collieries...	...	39 6B	39 0B	...	42 0S	..
Wolhuters	22 9B	...	22 6	22 6B	22 6	22 0B
Wit. Deeps ...	46 0B	46 6B	46 3B	46 0B	45 6B	...
West Rand Con. ...	...	...	...	...	6 0B	...
Zaaiplaats	53 0S	50 0B	52 0	50 0	51 6B	51 0B

B Buyers. S Sellers.

MINING MEN AND MATTERS.

It will interest many former students of the Glasgow and West of Scotland Technical College to learn that the King has been graciously pleased to direct that henceforth the name of the College shall be "The Royal Technical College, Glasgow."

* * * *

It is reported that the Chamber of Mines has offered to advance £15,000 to the Miners' Phthisis Board, whose funds are exhausted, on the understanding that Parliament will appropriate an equal amount for the same purpose from the public revenue. It is estimated that £30,000 at least is required to meet the calls on the fund, which was £50,000 originally.

* * * *

Mr. C. R. Davis, manager of the Lancaster Gold Mine, is resigning his position as from the end of the present month, to take the place vacated by Mr. B. C. Brodigan as General Manager of the Brakpan Mines. He will take a three months' holiday before taking up the position at Brakpan Mines. Mr. Tennant, of the South Randfontein Deep has been appointed manager of the Lancaster G.M.

* * * *

At the annual meeting of the Rhodesia Chamber of Mines, held in Bulawayo last week, Colonel Heyman proposed the re-election of Mr. Mitchell as President of the Chamber, paying a warm tribute to that gentleman's devotion to the interests of the industry and the country. On five previous occasions, he said, they had had the good fortune to get Mr. Mitchell to take that office, and they were to be congratulated that he had again consented to accept the position. The motion was carried unanimously and with acclamation. Mr. Mitchell briefly acknowledged the honour, and expressed the hope that some gentleman would be in a position next year to come forward to relieve him. Mr. P. B. S. Wrey and Col. Heyman were elected vice-presidents. The President moved the election of the hon. President (H.H. the Administrator), the hon. vice-presidents (Sir Starr Jameson and Mr. E. W. S. Montagu) and the hon. members (Major Maglashan, Mr. H. B. Maufe, and the Presidents of the Transvaal and Salisbury Chambers of Mines). The retiring members of the executive were re-elected. They are Messrs. George Stewart, Franklin White, C. B. Kingston, J. G. McDonald, R. M. Nairn, W. J. Atterbury, and Capt. W. B. Bucknall.

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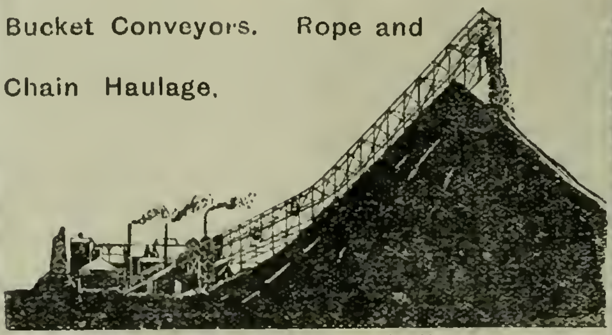

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Engineering Notes and News.

The West Rand Equipment.

POINTS OF INTEREST IN THE MACHINERY AND PLANT.

The equipment of West Rand Consolidated Mines as it stands to-day presents many features of interest to engineers. The plant has been gradually increased and modernised, and it may to-day take rank amongst the most efficient installations on the Witwatersrand. Certain portions of the old Violet and West Rand Mines equipments have been moved, and are now performing useful service, but a good deal of the old equipment has been eliminated. The greater part of the plant is now electrically operated, and we understand that the cost of power derived from the Transvaal and Victoria Falls Power Co.'s stations is quite satisfactory. The present battery consists of 100 stamps, 20 of which are of heavy falling weight. These obtained a duty during the quarter ending December last of about 12 tons per head per diem. During the past year a further tube mill has been installed with all necessary auxiliary plant and there are now four of these machines in commission. In addition to this there have been added to the metallurgical equipment during the past year two settling, three sand and three slime treatment tanks. At the West Shaft a very fine electrically operated plant has been installed on which the British Westinghouse Company and the Dingler Company, who supplied the machinery, are to be congratulated. Included in this plant are a 3 and a 6-ton electrically operated hoist, and a 75-drill electrically-operated air compressor of 7,100 cubic feet per minute capacity. Here, too, large crushing and sorting plants, to deal with the ore to be hoisted from the West Shaft, are completed. Waste rock from this section of the property instead of being elevated and run out along a trestle track, is conveyed direct from the shaft collar up an incline in a self-dumping skip. This tipping device has been found to answer most satisfactorily, and the most important feature in connection with it is that it has resulted in a large saving of labour. Furthermore, it is doubtful whether the first cost of this installation in reality exceeds that of an overhead trestle track, for which, of course, the working cost would be substantially higher. At the New Rand or Southern Shaft, a 66-feet high wooden headgear has been erected. This shaft is equipped with a 13-inch by 26-inch geared Robey hoist taken from the Violet Shaft, and a Cornish multitubular boiler removed from the Flora Shaft. This hoist has been erected close up against the headgear, thus leaving plenty of space for the installation of the permanent electric hoist when this is installed.

The West Shaft, West Rand Consolidated Mines.

Rand Gas Engine Case.

The Johannesburg Town Council has confirmed acceptance of the offer which puts an end to the litigation, which for years has occupied attention, between Mr. Beardmore and the Town Council, in connection with the old gas engines. The Edinburgh Court of Session gave judgment against the contractors for the gas engine plant—Messrs. Stewart and Co.—to the amount of £225,043, and against Mr. Wm. Beardmore for £115,134, the amount of his surety bond. An appeal was lodged in the case of Mr. Beardmore, but since then the Town Council has received an offer in full settlement of £80,000. The offer was refused, and the result has been an increase to £100,000, which at a meeting held in Committee it was agreed to accept. Should the Council confirm this decision, it will have at its disposal £175,000—namely, the £100,000 mentioned, and £67,000 retention money, held for the fulfilment of the old contract, and interest on the latter sum. Mr. Beardmore also asks for three months' option to purchase the derelict gas plant for £5,000, and the majority of the Councillors favour the acceptance of this. The civil law costs to date have amounted to £12,000, and it is estimated that the town has lost between £30,000 and £40,000. At this moment, however, £175,000 will be very welcome.

Rhodesian Railway Scheme.

With a view to obviating the haulage of water in tanks for locomotive purposes over the section of the railway from Mafeking to Bulawayo, a stretch of line which takes in "the desert," the Rhodesian Railways have for some years pursued a policy of, as far as possible, conserving and utilising the water sources en route. In this connection an interesting ceremony took place this week at what was formerly called the Crocodile Pools, now known as Notwani Siding, when Sir Lewis Michell, Director of the Rhodesian Railways and the Chartered Company, performed the opening ceremony in reference to what will henceforth be styled the Metsimasuane Dam, a weir constructed on the river of the same name, half a mile from Notwani Siding. This reservoir, which will have a storage capacity of 45 million gallons, is a mile in length, 350 yards wide at its greatest width, registers 22 feet at its lowest depth, and has occupied four months in construction, under the supervision of Mr. H. Wallis, C.E., District Superintendent, Mafeking. The weir is one of what is known as the overshot type, built of concrete. The top of the weir is four feet thick, with a vertical upstream face, and a battered downstream face. It is eleven feet thick at the bottom, and has an 18-inch pipe running from the bed of the river, with valve for scouring purposes. The wall itself is 100 yards long, with a subsidiary wall across the old bed of the river 170 feet long, composed of earthwork, with concrete core one foot thick. The scheme in construction has proved a most economical one, the total cost being approximately £1,100.

Three facts regarding the Transvaal worth remembering:

(1) The Transvaal is producing over one-third of the world's gold output.
(2) Transvaal mines have spent 24 millions sterling on machinery and plant.
(3) The *South African Mining Journal* is the official organ of the Mine Managers' Association.

Internal Combustion Engines.

A SHEFFIELD FIRM'S ENTERPRISE.

Amongst the various firms who have during the last few years taken up the manufacture of internal combustion engines, we may mention Messrs. Ambrose Shardlow and Co., Ltd., Ealing Works, Sheffield. As most of our readers are no doubt aware, Messrs. Shardlow and Co. are amongst the largest makers of crankshafts in Europe, and specialise very largely on this particular class of work, in addition to the business done in general engineering work. Some twelve months ago they decided to take up the manufacture of gas engines and suction gas producers, and are now in a position to supply all sizes from 10 B.H.P. to 100 B.H.P. The firm will shortly be completing very considerable extensions to their shops, and are putting down a new erecting and testing shop, having about 16,000 square feet of floor space, a further space being available for future extensions. The engines and the producers embody many distinctive features, a number of which have been patented, and the general design and construction represent the latest practice in this particular branch of engineering. The photograph shown is taken from the "G" size engine, which develops 25 B.H.P. on suction gas. All the engines manufactured by Messrs. Shardlow are governed on the "throttle" principle, the mixture remaining constant in quality but varying in quantity, the regulation being done by the Governor to suit the load on the engine. Special attention has been given to ensure very close governing of the engine, and it is found that with the special valve gear used it is possible to obtain a very wide range of speeds from any given engine. A typical engine made by the firm has a normal speed of 260 revolutions per minute, but it can be made to run quite regularly at a speed of 35 revolutions per minute, or any intermediate speed, provided of course the engine is running on light load. In some installations it is a convenience to be able to keep the engine running at a slow speed, but in any case the possibility of being able to do this shows that an extremely positive regulation is obtained on the engine. The correct ratio of gas and air is obtained by means of regulating valves, and when this ratio has been found the load on the engine can be varied from maximum to no-load and vice versa without causing the engine to show the least signs of back firing. It is found also that it is not at all necessary for an attendant to regulate the position of the spark to suit each variation in the load, provided he takes the trouble to adjust the ignition in the first instance to the proper position for satisfactory firing. The timing mechanism for ignition is fitted with an automatic looking device, and a patented index is used to enable the attendant to obtain readily the exact position of the spark for getting the best results from the engine. The ignition plug is so arranged as to be readily removed for cleaning purposes, and this can be done in considerably less than half a minute. The plug is made so that it is impossible for any trouble to take place through the striking spindle becoming fixed with rust or deposit. The patent valve gear used is of specially neat and simple construction, the number of parts in use being remarkably few. The speed regulation obtained by this device is extremely good, the variation from no-load to full load being remarkably low. A central plane construction is used for the inlet and exhaust valve actuating mechanism, so that any twisting stresses in the various pins are avoided.

Messrs. Shardlow and Co. have introduced an important feature in their engine in the special alloy steels that they are using for all parts that are subjected to heavy pressures and sudden shocks. Both the inlet and exhaust gears are of specially durable construction, and no cast-iron is used in these parts, or in any other fitting that is subjected to heavy stresses when in use. The cast-iron exhaust lever usually fitted to gas engines has here been entirely discarded, the particular form of exhaust lever used by Messrs. Shardlow and Co. being made of chrome vanadium steel. One cam only is used for actuating the inlet and exhaust valves, and this cam is made of special alloy steel. The use of steel of this kind ensures long life for the cam, and does away with the necessity of having to fit new cams to the engines after they have been working a year or so. The roller working in contact with the cam is made of 3 per cent. nickel steel, instead of mild steel or cast iron as is the general practice followed in the trade. The inlet valve and exhaust valve are made of 3 per cent. nickel steel, as this material has been found to give far more satisfactory results than either mild steel or cast-iron. So far as we are aware, Messrs. Shardlow and Co. are the only gas engine firm using alloy steels for the above mentioned parts, and although the cost of this material is very high there is not the least doubt that the results obtained warrant the extra outlay. A special feature is made of the lubricating system, which is patented. As will be seen from the illustration, a part of the engine bed itself is made to form an oil reservoir, and this is arranged with a division plate to enable two brands of oil being used, viz., one for the cylinder, etc., and another for the crank pin. The capacity of the oil chambers, or reservoirs, can be made as large as desired, being limited only by the size of the engine bed itself. The oil is supplied to the various parts by means of small pumps of the "plunger" type, fitted with ball valves, and delivering through small sight tubes. The travel of the pump plungers can be regulated to give the particular quantity of oil required, the regulation being capable of very exact adjustment. As will be noticed the construction described dispenses entirely with the use of the ordinary type glass lubricator. The main bearings, outer bearings, and also the camshaft bearings are all fitted with oil ring lubrication, and the spiral gears for the camshaft and governor are arranged to run continuously in a bath of oil. This ensures extremely sweet running, and reduces the wear of the gears to the minimum. A very interesting feature of the engine is a patented splash guard for the crank pin and connecting rod. The guard is made from polished blue steel and polished tubing, and is extremely light in weight. The guard is so made that it prevents any oil being thrown from the connecting rod on to the bed of the engine or on the back of the splash guard itself, as invariably happens with the ordinary type of guard. The method used for fixing the guard to the engine is very simple and effective, the tubing or bead being opened out to form a flange or lug by which the guard is secured to the bedplate of the engine. Four small set screws are found to be amply sufficient for holding the guard rigidly in position. The breech end of the engine is fitted with a loose cover plate, which can be readily removed so that it is possible for an attendant to insert his arm along the water jacket for cleaning out any deposit that may happen to take place. This is a matter of great importance in those districts where the water contains a considerable percentage of limestone, and it is certainly a desirable arrangement for any gas engine. Great attention has been paid to the very smallest of details. For instance, the terminals for the sparking plug and magneto are of a new patented form and involve no soldering, but yet produce a thoroughly satisfactory electrical connection, and one that can be depended upon to last for an indefinite period without needing attention. Most of the electrical terminals used on gas engines are liable to fail owing to the wire having to be exposed in order to make a connection with the terminals. In the particular device we refer to the socket for the terminal is made to support both the insulation to fray out and leave the wire exposed, as is found with the methods generally used. Messrs. Shardlow and Co. are also introducing a suction gas producer of special design. It is so constructed that it is possible to place the scrubber in at least six positions in relation to the generator without having to make any alteration to the various parts. This is a very great convenience, as it enables the producer to be installed in almost any conceivable space. The producer is of very simple construction, and requires only one plug cock to be closed or opened when putting the apparatus in or out of action. The charging hopper, which is of patented design, is so made that it is impossible for any jambing action to take place, and this improvement renders it an easy matter for the attendant to charge the generator. A special and patented form of sprinkler is used for cooling the gas on its passage through the scrubber. The device ensures that an even distribution of water shall take place over the surface of the coke, and so prevent any possibility of one side of the scrubber becoming much warmer than another. The scrubber is made with a cast-iron base, which is found to be much more durable than when made of thin steel plates, as the latter are very liable to rust through after being in use for some time. The upper part only of the scrubber is made of steel plate, and is provided with a suitable flange for fixing it to a cast-iron base. The producer is so constructed that the air before being carried to the fire is pre-heated, the necessary heat being extracted from the outlet pipe connecting the generator to the scrubber. This arrangement helps to cool the gases, and at the same time increases to some extent the efficiency of the complete plant. For starting the producer a patent water motor of the "Pelton" wheel type has been devised, and this is found to give extremely efficient results. The water motor can be connected up to any water main, and works with any ordinary pressure above 10lbs. per square inch. The amount of water consumed by the water motor is very small, and it is found that even when using water costing a shilling per thousand gallons it is considerably cheaper to start up the producer by means of the motor than it is to start up with the ordinary hand-driven fan, while at the same time it is very much more convenient for the attendant. Both the engine and the producer bear evidence of a great deal of thought having been bestowed upon them, not only in their general design but also in the minutest detail, and Messrs. Shardlow and Co. are putting their engine and producer on the market with every assurance of success.

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February Building Figures.

During February 307 plans were approved by the Johannesburg Municipality, these representing 541 separate buildings or tenements and an outlay (including the cost of drains) of £104.080. Accommodation is provided for 1,041 persons, including 935 whites. For the previous month plans numbered 275 and separate buildings and tenements 552, whilst the cost of construction was put at £95,032, and accommodation provided for 867. Thus in the first two months of the year nearly a round sum of £200,000 was to be invested in bricks and mortar and wood and iron. Of the 541 buildings and tenements approved in February 133 were dwelling houses, 75 additions and alterations, 191 rooms, 18 shops, 7 stores, 68 sheds, and 24 stables. Also out of 307 plans 149 showed structures of brick, 92 of wood and iron, 2 of stone, and 3 of iron, the balance being for drains.

* * * *

January Trade.

The Trade Returns published this week show that January was a good month for South African trade. The imports were considerably in excess of those of January, 1911, and the exports show a very striking increase. The figures for the Union are:—Imports: January, 1912, £3,247,653; January, 1911, £3,029,198. Exports: January, 1912, £5,338,849; January, 1911, £4,080,330. Exports (South African produce only): January, 1912, £5,204,489; January, 1911, £3,926,686. The imports into Southern Rhodesia have increased from £220,849 to £231,700 (though apart from specie there is a trifling decline), and the exports of South African produce from £177,805 to £287,349. Of the increased exportation of commodities produced in the Union (amounting in the aggregate to £1,277,803, or at a rate of over thirty per cent.), a considerable portion, as would be expected, is accounted for under the two headings of raw gold and diamonds. There is a net increase in the exportation of agricultural and general merchandise, other than gold and diamonds, amounting to £376,796. The following table shows the increase in the more important commodities exported:—

	Exports, Jan., 1912.	Increase.
Animals (living)	£2,972	£1,665
Bark	19,817	4,634
Coal	96,684	20,341
Feathers (ostrich)	173,187	11,969
Fodder and Forage	5,547	3,838
Fish (preserved)	4,474	4,206
Fruit (fresh)	10,852	4,153
Angora Hair	48,139	23,006
Hides and Skins	120,940	34,463
Whale Oil	9,947	9,216
Stationery	1,324	768
Wool	666,835	283,367
Tin Ore	14,471	10,338

The exports of maize, maize meal, and wheaten flour for the month are much below the figures of the previous year, the net decline under the general heading of corn, grain, and meal being just over £20,000, or almost exactly fifty per cent.

* * * *

Canadian Trade with South Africa.

Messrs. Elder Dempster and Co., who maintain a subsidised steamship service between Canada and South Africa, continue to issue for the information of exporters in the Dominion their valuable circular indicating business opportunities in South Africa, to which we have already referred in these columns. In a recent circular they devote their remarks to the market for paints and colours. They have been actively canvassing Canadian manufacturers to take an interest in this market, but so far, although several enquiries have been received from manufacturers regarding freights, no shipments have been made to South Africa. The company point out that this market in South Africa is almost entirely in the hands of British manufacturers, and that most of the painters in the country are either English or Australian. The painters rarely buy their paints mixed, but purchase the staining paste and mix it with the white lead and linseed oil themselves. A large number of British manufacturers have a large share in the market for staining paste, their productions, apparently, being regarded as almost equally excellent. One British firm which does not, like most of its competitors, maintain a permanent representative in South Africa, sends out its own traveller once a year, who makes a thorough canvass of the whole country, calling upon master painters as well as upon importers and local dealers. The traveller does not as a rule sell to the master painters, his object in calling upon them being simply to interest them in his firm's goods, but in the event of his receiving an order, commission would be paid to the merchant from whom the painter usually purchases his materials. British manufacturers also have the greatest part of the varnish trade, particularly the trade in high-class varnishes. There is competition from the United States with a copal varnish which is sold at eighty cents a gallon f.o.b. New York. Although the South African painters are accustomed to mix their own materials, there is a large demand in the country for cheap ready-mixed paints, which are usually sold in 1 lb., 2 lb., 4 lb., and 7 lb. tins. One of the best cold water paints on the market, we gather from Messrs. Elder Dempster and Co.'s circular, is supplied by a New York firm, against whom competition is making little headway, thanks to the enterprising manner in which the sale of their product is conducted. The New York company's trade is largely assisted by judicious advertising. In the market for enamels, one brand, also obtained from New York, enjoys an exceptionally fine reputation. All good dealers stock it, say Messrs. Elder Dempster and Co. The popularity of this enamel is, no doubt, enhanced by the careful and obliging manner of the manufacturers in dealing with their customers. The shipping company sees no reason why Canadian manufacturers should not be able to sell varnish, if not their paints, in South Africa. In another circular Messrs. Elder Dempster and Co. discuss the South African market for paper and manufactures of paper. This market also is largely controlled by British firms. The greater part of the remainder is supplied by the United States. Messrs. Elder Dempster and Co. have had some measure of success with their efforts to interest Canadian manufacturers in this market, and expected to ship a number of sample parcels last month. Wallpaper is demanded in South Africa chiefly in rolls made up in the usual English size of 21 in. by 36 ft. The Canadian and United States sizes are 18 in. by 48 ft., and despite this greater length, dealers in South Africa find it very difficult to obtain a higher price for American rolls than for British rolls, no doubt because the people have long been accustomed to the British size and price. The American wallpaper, being narrower, also requires more labour in hanging it. Canadian manufacturers appear to be reluctant to conform their productions to the English size, but are being urged to do so by the shipping company, who flatter them by saying that they are reliably informed that Canadian patterns are every much finer and more pleasing to the eye than British patterns. Messrs. Elder Dempster and Co. offer to place Canadian manufactures of any class of goods in touch with reliable firms in South Africa who would take up the sale of their productions.

Pilgrim's Rest Activity.

Elandsdrift is to be proclaimed on the 15th, the T.G.M.E. having declared their Mijnpacht. The Mali Dyke mill is running again. The new engine installed at Burnham & Munro's mine will be running next week. The Mali Dyke people have an option on the new find of the Miche reported recently.

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Unique Advertising Opportunity.

This year the "SOUTH AFRICAN MINING JOURNAL" celebrates its Twenty-First Birthday.

To mark the occasion a SPECIAL ANNIVERSARY ISSUE which will deal with every conceivable aspect of Mining, Metallurgy, Finance, Engineering, Railways, Harbours and Subsidiary Industries throughout the Sub-continent, will be issued in JUNE next.

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Contracts Open.

The Municipal Council of Johannesburg invites tenders for the supply of single cotton covered and braided copper wire (Mar. 13); C.I. brake blocks (Mar. 21); also white mealies (Mar. 20), shingles (Mar. 13); also for channel iron, deals and teff grass (Mar. 18).

The Municipality of Pretoria invites tenders for the laying of approximately 17 miles of concrete and stoneware pipe sewers, branch connections, manholes, etc., in that portion of Central Pretoria east of St. Andries Street (Mar. 13).

The Municipality of Pretoria invites tenders for the erection of the new fire station at the corner of Koch and Minnaar Streets (March 15).

The Town Council of the Borough of Ladysmith invite tenders for the excavation of trenches and the laying of about 4,560 lin. yards of 8in. cast iron pipes, in connection with the Ladysmith Waterworks (Mar. 14).

The Chairman of the Tender Board, Provincial Secretary's Office, Market Street, Pretoria, invites tenders for the erection of a bridge over the Klein Yokeskei River, Boschkop, District Pretoria (Mar. 29); also for additions to Bezuidenhout Valley School, Johannesburg (Mar. 29).

The Municipal Council of Johannesburg invites tenders for the supply of Light Tramway Track, Bricks, Tents (Mar. 12).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for printing and publishing the *Official Gazette of the Province of the Orange Free State* and printing and supplying Ordinances for that Province for a period of two years. The nature of the work necessitates its performance in Bloemfontein (Mar. 20).

The Chairman of the Tender Board, Attorney-General's Office, Pietermaritzburg, invites tenders for the undermentioned service:—Renewal of superstructure, Deepdale Bridge, Umkomaas River, Natal (Mar. 26).

The Provincial Secretary, Wale Street, Capetown, invites tenders for the erection of a bridge of two spans of 100 feet each over the Groote River at Steytlerville, Cape Province (Mar. 27).

The Chairman of the Road Board, Magistrate's Office, Standerton, invites tenders for the making and repairing of roads (Mar. 13).

The Chairman of the Road Board, Magistrate, Potchefstroom, invites tenders for the making and repairing of roads (Mar. 25).

The Secretary of the Pretoria School Board invites tenders for the supply of locally-made school furniture for the period 1st April, 1912, to 31st March, 1913 (Mar. 15).

The Municipality of Pretoria invites tenders for the carrying out of the work in connection with the erection of a Tramway Pavilion on East Island, Church Square, Pretoria (Mar. 15).

The Secretary of the Witwatersrand East School Board invites tenders for the supply of principal's writing desks, school tables, teachers' standing desks, school cupboards, for the period 1st April, 1912, to 31st March, 1913 (Mar. 11).

The Municipal Council of Johannesburg invites tenders for 8-inch Borehole, Ellis Park, Doornfontein (Mar. 15).

The Secretary to the Tender Board, S.A.R. Offices, Johannesburg, invites tenders for the earthworks and concrete of a section of half-a-mile in length, alongside the Olifants River, at a point of 28½ miles beyond Graafwater. The earthworks comprise the excavation of some 33,500 c. yards from two cuttings, and of approximately 96,000 c. yards to be obtained from borrow pits. The concrete is that required for the construction of a 10ft. arch culvert containing approximately 1,000 c. yards (Mar. 28); also for the building of the bridge over the Olifants River, consisting of 11 spans of 60ft., with steel superstructures, piers, and abutments of reinforced concrete carried on reinforced concrete piles (April 11).

ANSWERS TO CORRESPONDENTS.

"Inventor."—Apply to Mr. F. Rowland, School of Mines Buildings.

"Safety Catch" (Kimberley).—Write to the Secretary, Safety Catch Commission, Mines Department, New Law Courts, Johannesburg.

"Lux."—Your letter should be sent to the *Transvaal Leader*, in which paper the article appeared.

"Croton."—Enquiries are being made.

New Star Diamond Mine.

The manager reports to February 25 that delay has taken place in the commencement of washing owing to irregularities in transport. Even now he has only been able to wash with No. 1 pan. The plant is now all in place with the exception of No. 2 pan, which will be started in a few days. There have been a few interruptions to the smooth running of the plant, but up to Saturday 540 loads had been washed from the east and west faces of the mine, yielding 166 carats, amongst which is an 8-carat stone of unusual yellow colour. The sorting is not yet completed, as the deposit is very heavy. The diamonds at present in hand show an average of 37 carats to the hundred loads.

The ninth monthly general meeting of the South African Institute of Engineers will be held on Saturday next in the Council Chamber of the Chamber of Mines. Mr. C. J. N. Jourdan will reply to discussion on his paper entitled, "The Prevention of Dust in the Development Drives of Mines during Drilling Operations." This reply promises to be of great interest on account of the number of members and visitors who have taken part in the discussion on the original paper. Mr. A. S. Ostreicher will read a paper entitled "Loss due to Impact in Californian Stamps." Discussion will take place on Mr. A. E. Blevins's paper, entitled "The Evolution of Printing and Typesetting Machinery." Discussion will be concluded on Mr. H. J. S. Heather's paper entitled "Current and Power Factors in Induction Motors," and on Mr. Kenneth Austin's paper entitled "The Combustion of Coal."

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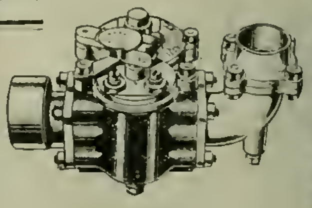

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Automobile Notes.

The Popularity of the Car.

The motor car to-day is so familiarly discussed by all classes of the community that it would be difficult to encounter an individual, especially among the enlightened section of the public, without pretensions to at least some knowledge, however slight, of the automobile. Even one finds that terms of a technical nature as applied in the industry, so little understood some years ago, have become quite commonplace. People are recognising daily the supreme adaptability of the car in regard to almost every conceivable pursuit, and in expectancy await the many and great developments which are destined to still further attend its progressive march. Those who from prejudice in the past have viewed the motor askance, in spite of the convincing proofs of its immense utility, have perforce to acknowledge the facilities, overwhelming in their nature, provided in this modern means of locomotion, as no argument to the contrary can to-day appear other than meaningless. Although, strictly speaking, the manufacture of motor vehicles is one of the youngest of British industries, yet the business is being highly specialised; in fact, design and production are beset with such grave difficulties as to render it quite impossible for the "dabbler" type of manufacturer to make reliable or efficient cars. The buying, therefore, of a motor vehicle is to anyone a project of the greatest importance, as not only does a misjudged purchase result in heavy financial loss, but a motor car of inferior design, or in which bad workmanship or material has been embodied is often highly dangerous in use. Thus it naturally follows that a bad selection means keen disappointment, monetary loss, and involves perhaps personal danger. In the choice of a car for South Africa, where it will be frequently driven at locomotive speeds over roads of the roughest description, it is obvious that design, material and workmanship must be of the highest order. In this country the amount of clearance available is perhaps the chief determining factor in a car's favour; but a machine must combine, in addition, sterling qualities in regard to reliability in hill-climbing, capable of developing a good all-round pulling power in mud and sand, so frequently encountered, and maintaining a fair speed on all the better roads; in short, a car that will stand up to the required work. Now that manufacturers are realising the value of the South African trade, a special study is being made of the requirements, which the peculiar conditions of the country demand, and in the simplifying of the colonial models the ideal car for these parts is being produced, embodying the features referred to, and characterised by a reduction of working parts which materially contributes to the desired efficiency.

Motorists and Traffic.

Motorists will be particularly interested in that section of the amended draft of the Local Government Ordinance dealing with street and general traffic, being dealt with by the Provincial Council of the Transvaal. The matter of street control, it need hardly be pointed out, is of the highest importance to drivers of swiftly-moving vehicles, and all measures whereby the safety of pedestrians in the streets may be assured, and accidents reduced to a minimum, will be endorsed to the full by the entire motorist community. Much that is gratifying and otherwise has been said and written about the control of the traffic in Johannesburg, and it is not intended to criticise the methods

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employed by the authorities in their attempt to perfect a system, meeting with universal approval, beyond saying that much remains to be done in this particular direction.

Some Rand Dangers.

Time and again these columns have referred to the gross carelessness exhibited by native and coloured drivers, who entirely disregard all rules and regulations laid down for street control, to which may be attributed by far the majority of accidents recorded. It is, however, anticipated that this particular aspect of street danger will be systematically dealt with in the near future. The unhappy motorist has also come in for a large share of public disfavour, through the indiscretion of a section in the autoist ranks that at times glaringly offend, and while perhaps escaping their just rewards, are at least awarded sufficient publicity in the Press, whenever a chance arises. It is grossly unfair, however, to condemn in wholesale fashion all motorists for the misdeeds of a few individuals, but, as pointed out while the Press, as representative of the public feeling continues to indulge in extravagant effusions each time a motorist is associated with a street accident, so long will unmerited obloquy continue to be levelled at the motorist. Provision is also made in the Draft Ordinance, whereby the Council will be empowered to test the efficiency of all applicants for licences to drive motor cars in public; an obviously commendable step, and one which will serve to appreciably eliminate the risks the car undoubtedly creates in the hands of the novice.

The Motorist's Point of View.

Those of the public, however, who are unacquainted with the motor car in a practical sense, before harshly reproving the long-suffering motorist, should, for instance, hire a car for a few hours, and be driven through some of the principal streets, when convincing evidence would be revealed to show that motorists after all are seldom at fault, pedestrians being the chief offenders, and that the risks run by chauffeurs, through the carelessness of the latter, are by no means overdrawn.

Accidents.

A regrettable feature of the week has been the number of accidents reported, several proving fatal. In one instance a young motor cyclist, according to accounts, evidently misjudged the time necessary to clear in front of a trolley crossing his path at right angles, and sustained fatal injuries. The distressing occurrence once again, it may be said, emphasises the necessity for an exercise of extreme caution, which exists, when negotiating streets planned on the Johannesburg system, and although no blame, it seems, attaches to the driver of the trolley in question, it is certainly one of those cases where the exception proves the rule, as the recklessness displayed by coloured drivers of this class of vehicle is notorious, and dangerous in the highest degree. As previouslsy mentioned drastic measures to cope with this evil will very shortly be put into operation by the authorities.

T.A.C. Events.

The Transvaal Automobile Club racing season, which starts with the advent of Easter, will once again bring into prominence the capabilities of the modern car, from the points of view of speed, hill climbing, endurance propensities, and so forth. It is to be regretted, however, that the much desired track is still in the speculative stage, as were it available, much of the danger now associated with motor racing in speed competitions, owing to the many ground inequalities even on the best selected vicinities, would be reduced considerably were contests conducted on a prepared track, and the various cars competing would be afforded better opportunities of demonstrating their respective prowess than is now possible.

Mr. Edge's references to Brooklands track during his recent visit was very interesting to local motor enthusiasts, and will probably act as a stimulus in point of the proposed T.A.C. track. The famous motorist's description of cars racing at Brooklands, from his own personal experience, was highly instructive, and when one reflects on the fact that cars, even on that perfect surface, when travelling "all out" jump 30 to 50 feet if they but leave the ground for a fraction of a second, it makes it all the more apparent the need which exists for a proper track to decide tests of speed.

The Car and the Law.

It may not be altogether out of place or superfluous in the interests of motor traders and others, to refer to a case of misrepresentation with regard to the sale of a motor car, which was decided recently before the King's Bench Division in London.

It appears that the plaintiff in the case purchased a chassis, to which a body in the nature of a commercial van had been fitted, the defendant alleging that the vehicle was an unique bargain. Despite much attention, however, from the purchaser, in the way of lubricants, etc., the machine would not go for more than a few minutes at a time, while all attempts to persuade it to climb hills proved abortive. It was discovered eventually that all the cylinders were cracked, and these had to be replaced at great expense, but failed to bring about the wished for success, the outlay being met by the purchaser. The evidence in the case showed that the car was again furbished up, but would not move on the road, and was given up as absolutely hopeless. The opinion of experts, taken on commission, in the case, was to the effect that the chassis was quite different from the specification tendered, and judgment was given for the plaintiff for the full amount claimed.

Reduced Price of Motor Spirit.

The motoring community will note with due thankfulness that the price of Shell motor spirit has been reduced to 17s. per case, due, no doubt, to the prevailing competition. The "Shell" spirit is obtainable at all the garages in Johannesburg.

Transvaal G.M. Estates.

The general manager wires that the output for the month of February, 1912, is as follows:—Central Mine: Tons crushed, 10,500; yielding 6,120 ozs. fine gold, valued at £25,538. Elandsdrift Mine: Tons crushed, 625; yielding 600 ozs. fine gold, valued at £2,501. Vaalhoek Mine: Tons crushed, 1,176; yielding 390 ozs. fine gold, valued at £1,640. Total value of month's output, £29,679; estimated profit for the month, £15,002; gold in reserve, 1,361 ozs.

INVESTORS' DIARY.

The following company meetings have been announced:—

March 12.—Durban Rood. Deep.
March 13.—Robinson G.M.
March 14.—Bantjes Con. Mines.
March 15.—Village Deep.
March 20.—City Deep; Lancaster West; May Consolidated; Anglo-French Coal Estates.
March 21.—Ferreira G.M.
March 22.—Modder "B"; Vogel Cons. Deep; Knight Central.
March 26.—Cassel Coal Co.
March 27.—Rand Mines; Modder Deep Levels; Princess Estate; Geduld Prop.; S.A. Gold Mines.
March 28.—East Rand Deep.
March 29.—Simmer Deep; Jupiter.
April 12.—Transvaal Consolidated Lands.
April 17.—South Randfontein Deep.
April 25.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep; Cloverfield (Extraordinary General Meetings).
April 30.—New Era; Springs Mines; Brakpan Mines, Transvaal Coal Trust.
May 8.—Roberts Victor Diamonds.
May 10.—Ferreira Deep: Ferreira G.M.
May 17.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep (Extraordinary General Meetings).
May 22.—Apex Mines; New Kleinfontein.
May 23.—Benoni Consolidated.
June 4.—Ferreira G.M.

Durban-Roodepoort Deep, Limited.

(Incorporated in the Transvaal).

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Fifteenth Annual Ordinary General Meeting of Shareholders, for the year ended 31st December, 1911, will be held in the Board Room, The Corner House, Johannesburg, on TUESDAY, 12th MARCH, 1912, at 12 noon, for the following business :—

(1) To receive and consider the Balance Sheet, Working Expenditure and Revenue Account, and Appropriation Account, for the year ended 31st December, 1911, and the Reports of the Directors and Auditors.

(2) To elect two Directors in the place of Messrs. E. A. Wallers and H. C. Boyd, who retire by rotation in accordance with the provisions of the Company's Articles of Association, but are eligible and offer themselves for re-election.

(3) To elect Auditors in the place of Messrs. J. P. O'Reilly and E. Danckwerts, who retire, but are eligible for re-election, and to fix their remuneration for the past Audit.

(4) To transact General Business.

The Transfer Books of the Company will be closed from the 12th March to the 18th March, 1912, both days inclusive.

Holders of Share Warrants to Bearer wishing to be represented at the Meeting must deposit their Share Warrants, or may at their option produce same, at the places and within the times following :

(a) At the Head Office of the Company in Johannesburg, at least 24 hours before the time appointed for the holding of the Meeting.

(b) At the London Office of the Company, 1, London Wall Buildings, London Wall, E.C., at least 30 days before the date appointed for the holding of the Meeting.

(c) At the Compagnie Francaise de Banque et de Mines, 20, Rue Taitbout, Paris, at least 30 days before the date appointed for the holding of the Meeting.

Upon such production or deposit, a Certificate, with Proxy Form, will be issued, under which such Bearer Warrant Holders may attend the Meeting either in person or by Proxy.

By Order of the Board
RAND MINES, LTD., Secretaries.
S. C. STEIL, Joint Secretary.

Head Office : The Corner House,
Johannesburg, 1st January, 1912. 21612

Robinson Gold Mining Co., Limited.

(Incorporated in the Transvaal).

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Twenty-Second Annual Ordinary General Meeting of Shareholders for the year ended 31st December, 1911, will be held in the Board Room, The Corner House, Johannesburg, on WEDNESDAY, 13th MARCH, 1912, at 11 a.m., for the following business :—

(1) To receive and consider the Balance Sheet and Accounts for the year ended 31st December, 1911, and the Reports of the Directors and Auditors.

(2) To confirm the appointment by the Board of Mr. S. Evans as a Director of the Company, vice Mr. C. Distel, resigned.

(3) To elect Directors in the place of Mr. R. W. Schumacher and Mr. H. O'K. Webber, who retire in accordance with the provisions of the Articles of Association, but are eligible and offer themselves for re election.

(4) To appoint Auditors in the place of Mr. H. J. Macrae and Messrs. C. L. Andersson and Co., who are eligible for re-appointment, and to fix their remuneration for the past audit.

(5) To transact general business

The Share Transfer Books will be closed from the 13th March, 1912, to 19th March, 1912, both days inclusive.

Holders of Share Warrants to Bearer wishing to be present or represented at the meeting, must deposit their Share Warrants (or may, at their option, produce same) at the places and within the times following :—

(a) At the Head Office of the Company in Johannesburg, at least twenty-four hours before the time appointed for the holding of the meeting.

(b) At the London Office of the Company, No. 1 London Wall Buildings, E.C., at least thirty days before the date appointed for the holding of the meeting.

(c) At the office of the Banque de Paris et des Pays Bas, 3, Rue D'Antin, Paris, at least thirty days before the date appointed for the holding of the meeting.

And must otherwise comply with the "Conditions as to the issue of Share Warrants or Bearer Shares" now in force.

Upon such production or deposit a certificate, with proxy form, will be issued under which such Bearer Warrant holder may attend the meeting either in person or by proxy.

By Order of the Board.
RAND MINES, LTD., Secretaries,
S. C. STEIL. Joint Secretary.

Head Office : The Corner House,
Johannesburg, Transvaal, 1st January, 1912. 21607

Village Deep, Limited.

(Incorporated in the Transvaal).

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Twelfth Annual Ordinary General Meeting of Shareholders for the year ended 31st December, 1911, will be held in the Board Room, The Corner House, Johannesburg, on FRIDAY, the 15th MARCH, 1912, at 12 noon, for the following business :—

1. To receive and consider the Balance Sheet and Accounts for the year ended 31st December, 1911, and the Reports of the Directors and Auditors.

2. To elect two Directors in the place of Mr. J. H. Ryan and Mr. E. A. Wallers, who retire in accordance with the provisions of the Articles of Association, but are eligible and offer themselves for re-election.

3. To appoint Auditors in the place of Mr. T. Douglas, C.A., and Messrs. Ball and Stuart, who are eligible for re-appointment, and to fix their remuneration for the past audit.

4. To transact General Business.

The Share Transfer Books will be closed from the 15th March, 1912, to the 21st March, 1912, both days inclusive.

Holders of Share Warrants to Bearer, who desire to be present or represented at the meeting must deposit their Share Warrants (or may, at their option, produce same) at the places and within the times following :—

(a) At the Head Office of the Company in Johannesburg, at least 24 hours before the time appointed for the holding of the meeting.

(b) At London Office of the Company, No. 1, London Wall Buildings, E.C., at least thirty days before the date appointed for the holding of the meeting.

(c) At the Office of the Cie. Francaise de Banque et de Mines, 20, Rue Taitbout, Paris, at least thirty days before the date appointed for the holding of the meeting.

and must otherwise comply with the "Conditions as to the issue of Share Warrants or Bearer Shares" now in force.

Upon such production or deposit a certificate, with proxy form, will be issued under which such Bearer Warrant holder may attend the meeting either in person or by proxy.

By Order of the Board.
RAND MINES, LTD., Secretaries,
S. C. STEIL, Joint Secretary.

Head Office : The Corner House,
Johannesburg, Transvaal, 1st January, 1912. 21605

Bantjes Consolidated Mines, Limited.

(Incorporated in the Transvaal).

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Fifteenth Annual Ordinary General Meeting of Shareholders for the year ended 31st December, 1911, will be held in the Board Room, The Corner House, Johannesburg, on THURSDAY, the 14th MARCH, 1912, at 12 noon, for the following business :—

1. To receive and consider the Balance Sheet and Accounts for the year ended 31st December, 1911, and the Reports of the Directors and Auditors.

2. To elect Directors in the place of the present Board who retire in accordance with the provisions of the Articles of Association, but are eligible and offer themselves for re-election.

3. To appoint Auditors in the place of Messrs. C. L. Andersson and Co., and Mr. E. Danckwerts, who are eligible for re-appointment, and to fix their remuneration for the past audit.

4. To transact general business.

The Share Transfer Books will be closed from the 14th March, 1912, to the 20th March, 1912, both days inclusive.

Holders of Share Warrants to Bearer who desire to be present or represented at the meeting must deposit their Share Warrants (or may, at their option, produce same) at the places and within the times following :—

(a) At the Head Office of the Company in Johannesburg at least twenty-four hours before the time appointed for the holding of the meeting.

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Notes and News.

Adjourned Meetings. As announced some time ago, the annual meetings of Rand mining companies that were to have been held during the past few days have been adjourned till May next, in order that shareholders might have an opportunity to study the balance sheets and reports. The annual reports and accounts will be found fully set out in this issue.

* * * *

Important Managerial Changes. Further changes are taking place in the management of certain important Rand mining properties associated with the Central Mining and Investment Corporation. Mr. H. Musson-Thomas has resigned his position as manager of the Geldenhuis Deep G.M. Co., and his place has been taken by Mr. P. Selby, formerly manager of the Robinson mine. Mr. Palmer Carter, who has been manager of the Ferreira Company for the past nine and a half years, will succeed Mr. Selby at the Robinson. The fusion of the Ferreira and the Ferreira Deep necessitates, of course, the removal of one manager from the Ferreira section. We understand that for the time being the affairs of the Ferreira Outcrop Company will be managed by Mr. Smith, of that property. After the completion of the amalgamation Mr. Trump, at present manager of the Ferreira Deep, will superintend the amalgamated concern.

* * * *

Cloverfield Mines. Presiding at the annual meeting of the Cloverfield Mines, Ltd., held in Johannesburg at the end of last week, Mr. W. H. Dawe referred to the withdrawal of the proposals received previous to the former meeting by the Board for dealing with the property, and stated that the directors were not in a position to submit another scheme, the times not having been propitious. Current expenditure, principally for claim licences, he said, was being met out of the loan arranged, which at the end of December amounted to £43,663, including interest. Machinery and buildings on the property are being kept in good order. The company has still 30,000 reserve shares in hand.

* * * *

Progress at the Quest. At the Quest mine thirty stamps are now hard at work, and new pile blocks for ten additional stamps are being put in. These will be set to work as soon as completed. The results have been satisfactory, and the extension of the mill appears to corroborate the report. The output for February was gold to the value of £2,659 produced from 2,231 tons crushed. The profit for the month was £662.

* * * *

Appointments Vacant. Attention is drawn to the advertisement appearing in this issue of a development company, operating in Rhodesia, which requires the services of two mining engineers between the ages of twenty-eight and thirty-three, to make preliminary investigation of mining properties or oversee development of ground under option. Moderate knowledge of Rhodesia is desirable, but not imperative, and engineers who have successfully undertaken similar work on other than banket mines will be given preference. A moderate salaried position is offered at start, but it is one with good possibilities. In replying, applicants should state salary expected, age, nationality, university and year of graduation. They should attach a record of past employment, copies of recommendations, and give references. Replies directed to "Rhodesia," c/o this office, will be treated in confidence.

* * * *

The Sheba. Mr. White, the manager of the Sheba, has been in town during the week. He speaks most favourably of the mine, and it seems that a new lease of life has been entered upon by this historic Barberton property.

Transvaal Silver Mines.

It will doubtless be recalled by numbers of our readers that the Transvaal Silver Mines, Ltd., was liquidated in December, 1909. The property of this company consisted of 3,458 morgen on the farm Dwaarsfontein in the Pretoria District, and at the date of liquidation the company had an issued capital of £146,700. It is interesting to learn that this property is now being re-opened, and that the syndicate which has taken over the proposition already has attained to the stage of production. A portion of the mine has been dewatered and argentiferous galena and zinc is being raised. We understand that the zinc is exported whilst a local market has been found for the argentiferous galena.

* * * *

Pigg's Peak and Frank Smith Diamonds.

Mr. D. V. Burnett, who has retired from Pigg's Peak in order to take over the management of Mr. Hollins' Rhodesian interests, will be succeeded by Mr. Chas. Hunter, the able and popular manager of the Lisbon-Berlyn. Mr. Hunter will be succeeded by Mr. Coleman at the latter property. As will be seen from the monthly returns published elsewhere, the Piggs Peak profits are creeping up, and the additional reduction plant will be ready at the end of April. We understand that application is being made to the Johannesburg Stock Exchange for a quotation for the shares. A similar application is being made on behalf of Frank Smith Diamonds, which, under the management of Mr. Tom McLellan, are looking up. The Ebenezer mine in the Free State has been leased by the Frank Smith Company, and is being equipped.

* * * *

Eldorado.

Mr. H. A. Piper, the consulting engineer to the Gold Fields Rhodesian Development Company, has inspected the Eldorado Banket Mine, and he fully endorses Mr. Jones's telegram of January 8th. So far as one can glean there is nothing wrong with the mine, for in a winze going down from the eighth level on the main reef the ore assays 28 dwts. over 52½ in. for a distance of 90 feet, the last five feet of sinking averaging 32 dwts. over 55 in. Nothing of a more definite character can be reported with regard to the ninth level until the end of March, but Mr. Piper considers the position encouraging.

* * * *

The Central Dividend.

The Central Mining and Investment Corporation announces that there is to be no final dividend on account of 1911. This action is one of policy. The profits earned are sufficient to permit a distribution, but the board considers it advisable to set aside the greater portion against abnormal depreciation in investments, although on the basis of the market quotations at the end of December, the assets, after allowing for all liabilities, more than represented the capital. No definite figures as to the amount of depreciation can yet be given. The decision has been generally expected, as the decline in prices has seriously affected all the big South African finance companies. Last year, it may be remembered, the Central Mining capital was increased from £3,600,000 to £5,100,000, mainly to acquire certain share assets, which Messrs. Wernher Beit and Messrs. Eckstein and Co. then valued at £1,224,271, the whole of which was satisfied in £12 shares, now quoted at a little over 9.

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Waites' Witpoortje Claims.

For some time after the pegging of the claims on Witpoortje, which gave such remarkable results from a thin pebble leader and its accompanying sandstone walls, Mr. Waites, who pegged the ground, was content to extract such ore as was necessary to prove the merits of his patented process of saving gold by a hydraulic hindered settling apparatus. We have no information as to the final results of this experiment, but it is interesting to learn that a small two-stamp battery is now being erected, and judging from the size of the equipment we conclude that the process will be continued for practical recovery purposes.

West Rand Unified.

Mr. W. Smith, M.I.M.M., formerly of Buffelsdoorn, has been appointed manager of the property of the West Rand Unified, Ltd., and left town on Friday to take up his residence at the mine. The 20-stamp mill is in course of completion, and it is anticipated that a trial run will be possible within a fortnight or so.

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Crown Mines Explosion.

An explosion occurred at the Crown Mines on Thursday at the new reduction works, where a clean up was being carried out. One of the acid vats exploded, one person was thrown violently into the air and on falling fractured his skull, a second was injured in a lesser degree, and the foreman in charge was severely shaken. No explanation is given yet with regard to the occurrence, but there is the suggestion that some person may have thoughtlessly struck a match in the presence of gas at the acid tub where the explosion took place.

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Mr. G. A. Denny's Views.

In sending us an interesting contribution for our forthcoming special Majority Number, Mr. George A. Denny writes one of his characteristic little letters which, in view of the Rand's well-known tolerance of criticism, we print as written. Mr. Denny says:—"I send you herewith a little note for your special number, which I hope you may think suitable. I have been so busy since my return here, that I have had no opportunity to prepare anything more. You will gather that my diagnosis of your trouble out there is that your technical and financial men are all self-hypnotised, and in order to restore confidence a clean sweep must be made of the men, or many of them, who have been so long at the head of affairs, that they have become stale and unprogressive. They must be substituted by men of wider vision and broader experience. I believe it only needs new blood on the Rand, both in many of the directorates and the engineering leaderships, to make such an enormous improvement as would re-create your most halcyon days." Mr. Denny is, of course, entitled to his very sweeping opinions, but we believe that, had he been aware of the many drastic alterations in the financial and engineering *personnel* of the industry of late, he would be in favour of less, not more, of such changes.

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Diggers and Alluvial.

The diamond figures for 1911, published by the Mines Department, reflect the relatively large proportion returned by alluvial and river diggings, and the unremunerative character of the work as shown by the average return per annum per person at work. The diggers of Kimberley, Barkly West, Herbert and Kuruman obtained a return, taking white and coloured together, of £49 8s. 5d. each, the Orange Free State diggers £35 6s., and Transvaal alluvial workers £33 10s. per annum. If the wage paid to and cost of food for coloured persons employed on alluvial digging were, say, £2 per month, then out of the value of the produce there would be left a sum equivalent to £79 per annum, or less than £7 per month, for each person working during the year.

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Diamond Sales in 1911.

Reviewing the American diamond market in 1911, Mr. G. F. Kunz, the gem expert, writes in the *Engineering and Mining Journal*: " It seems remarkable that in the face of a universal financial depression the price of diamonds and pearls should have advanced considerably since 1906, and this after only one year's shutdown of the great group of diamond mines, and with no attempt to regulate the price of pearls. The imports of precious stones have remained constant, for, although the imports in 1908 were less than in 1906, a banner year, this was partly the result of overbuying, and the effect of the small importation in 1908 was the selling down of the old stocks, which in turn led to the greater imports of 1909, 1910, and 1911. That the sale of precious stones does not always fluctuate was never more apparent than this year. But it will invariably happen that when people are assured of the permanent worth of an investment they will not hesitate to buy even when the financial situation appears to be less favourable than usual, or else they buy because they will buy under all circumstances. However, the upward trend of prices, especially that of the diamond output, has steadily continued, in spite of occasional setbacks; this is clearly apparent when we compare the average prices of the uncut, rough diamonds for five-year periods for the last 20 years: 1891 to 1895, average price per carat, 26s. 9·45d.; 1896 to 1900, 29s. 1·15d. per carat, increase in price, 8·6 per cent.; 1901 to 1905, 47s. 3·36d. per carat, increase, 62·5 per cent.; 1906 to 1910, 55s. 7·93d. per carat, increase, 17·7 per cent. The diamond syndicate advances on the price of rough diamonds when sold to the diamond cutters have been as follows: June, 1906, 4 per cent.; May, 1907, 8; June, 1909, 5; June, 1910, 2 per cent.

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The City Deep Case.

The City Deep case has at last taken some definite shape. Before the Court this week an application was made by the City Deep asking that the Federation Company, Limited, should be ordered to give security to the extent of £1,000 for costs to be incurred in the action which the latter company had instituted against the applicant company. The respondent company was one registered outside South Africa, and had no assets in South Africa. There was no dispute about the liability to give security, and the only question was as to the amount. The respondent company had offered £500, and from time to time further sums as required. For respondents it was contended that the amount offered was reasonable, and that there had been undue extravagance in the preparation of the case. In giving judgment, Mr. Justice Mason said the case was one in which the question of the titles of the defendant, of a value of several million pounds, would be investigated, which would involve going into the history of a great many of the claims for a period of a great number of years. It was clear that there was a possibility of an extremely intricate lawsuit, and under the circumstances security ought to be given to cover what would be the probable costs. It was practically admitted that what the respondent company proposed was a somewhat unusual procedure, and the Court would not be justified in imposing that special form of security. Under the circumstances the Court ought to grant the application. With regard to costs, had the respondents made a sufficient tender and the defendants had unnecessarily brought them before the Court, no costs would have been given, but under the circumstances the usual rule should be followed, and the successful party should be awarded costs.

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The Chartered Meeting.

In the absence of the Duke of Abercorn, Mr. Rochfort Maguire delivered the chairman's address, at the Chartered meeting in London, and ably dealt with the salient features of the accounts. On these we have already commented, but may repeat that the working capital of today is £1,785,464, of which £562,731 is in cash and short loans, and £1,222,733 invested in first-class securities, and if the options over the reserved capital (which mature on June 30), are exercised, the working capital will be still further increased. The chairman said that "the development of Rhodesia depends upon a full and sufficient supply of African labour," and, to ensure this, the board are taking energetic and practical steps. Whilst doing all that is possible from the humane point of view for the native, they wish to increase his efficiency for work, but it is realised that Southern Rhodesia cannot, at present, depend upon its own labour supply, and must get an addition thereto from the outside, hence the reorganisation of the Rhodesia Native Labour Bureau. What the chairman had to say about the commercial side of the company's business was very encouraging, and his remarks upon the Land Bank will be read with satisfaction. There has been a record, despite the dearth of labour, for gold, coal, and chrome, with every prospect of increase in each department. The powerful combination, of which Lord Harris is the head, will pursue an energetic policy, which cannot fail to have an effect upon the gold output, and so also will the development work the Chartered Co. proposes to undertake on its own account.

TOPICS OF THE WEEK.

A BATCH OF ANNUAL REPORTS.

The batch of annual reports of Rand companies issued during the past few days may, no doubt, be regarded as a reliable index to the tone and tendency of all of them. The reports, as will be seen from the extracts published in this issue, comprise those of the majority of the Corner House companies, including the Crown Mines, and some mines of the Neumann control. Though the new arrangement means that shareholders for some months will be without the usual chairman's commentary on the reports, these last are now couched in such plain, non-technical language that none can fail to master them. It will be seen, for instance, that during 1911 the industry in general suffered acutely from the "shortage, poor quality, and irregularity" of the native labour supply. That fact crops up somewhere in every report yet issued, just as we have no doubt it will colour and qualify every annual report about to come. In addition, of course, the different mines have suffered from their own individual difficulties. The Crown Mines is still in a state of transition and reorganisation, on the surface and underground. The Durban Roodepoort Deep suffered from shaft and water troubles. The Geldenhuis Deep experienced a particularly trying time, owing to a falling off in development values. The Robinson has had its own worries, as analysed and faithfully detailed by Mr. Selby in his report. The Village Deep and Rose Deep are fortunate in having few special troubles. The Banties has had to do a lot of development work in country rock, that could not return any immediate reward in additional ore reserves. The Wit. Deep had the worst luck of all, owing to water trouble that delayed development. Fortunately the intrusion of dykes in the lower levels has not been such a serious matter as was feared.

By the time the Crown Mines postponed meeting is held the Chairman will, no doubt, be able to point to improvement in several directions at the mine. The property will then, doubtless, be unified, and the big programme of construction satisfactorily completed. The ore reserve position is excellent, an increase of 3,841,353 tons in the year, bringing the grand total at December 31 up to 10,124,072 tons, value 7·25 dwts. The most significant passage in Mr. Stuart Martin's report is that where he says: "Conditions at the mine are still abnormal and will so continue until all of the work estimated for in the enlarged programme has been completed, which we hope will be towards the latter part of the current year. This work is being pushed forward with all possible rapidity, but with a property of such huge extent radical alterations in the general lay-out and extensive additions to plant are only to be effected gradually. Working costs are naturally considerably penalised during this transition period. The company still continues to be severely handicapped by the shortage of native labour, and not only is the supply deficient but the labour force as a whole is less elastic." Development operations were again conducted on a very extensive scale, the resultant footage totalling 71,023 feet, of which 59 per cent., or 42,176 feet, were in reef formation. The ore disclosed amounted to 4,712,353 tons, of an average value of 7·3 dwts. In another part of this issue we give an account of the latest additions to the reduction plant at the mine, and it would seem that time and adequate labour are all that are now required to enable the property to realize its great possibilities.

With the exception of the Geldenhuis Deep, all the Corner House deep levels have good results to show. For careful readers of our columns, the reports contain no surprises, and steady progress in the face of difficulties of varying degrees is the keynote of the year. The Village Deep is making cautious and certain headway, each year making a fair advance on its predecessor. Apparently the directors have learned from the lessons of the recent past the dangers of equipping a mine with too extensive reduction works, and in view of the ever-present labour scarcity, they are no doubt wise in contenting themselves with the existing crushing capacity of the plant. The Durban Roodepoort

Deep is steadily improving its position, despite general and particular difficulties; and the new centralisation scheme promises greatly to facilitate working to the best advantage. The fact that so much immediately unprofitable development has been necessary at the Bantjes in no wise dims the prospects of that property; and the Robinson is experiencing nothing more than the drawbacks inherent in the working of the mine at this stage of its life. Naturally the Geldenhuis Deep is proving a more difficult proposition than the Rose Deep. Now that the Geldenhuis Estate mill is closed down, and more labour is available for stoping without drawing on the labour available for development, things ought to go better. A change of management has also been made, and Mr. Paul Selby has been set the task of rehabilitating the property. In this case, as in that of the Crown Mines, the postponement of the annual meeting to May is probably a blessing in disguise, because, incidentally, it will allow sufficient time to elapse to improve the complexion of affairs at the mine. By that time, moreover, it is to be hoped that the labour supply will likewise have so improved as to alter in this vital respect the general outlook for the Rand.

THE HEALTH CAMPAIGN.

The campaign against phthisis and pneumonia on the mines of the Rand gathers strength daily. In a notable contribution to the literature of bacteriological research, Sir Almroth Wright indicated during the week that his labours on the Rand promised to produce good fruit. In his lecture, delivered at Capetown, Sir A. Wright gave his hearers to understand that though the therapeutic side of his work at Johannesburg had not been very successful, he hoped that the prophylactic side had. This, we take it, means that though the distinguished physician does not expect to do much in the way of healing those actually stricken with pneumonia, he is sanguine of discovering how to prevent the spread of the disease. As far as we are aware, this is as much as the most optimistic hoped for as the result of his labours. Should Sir Almroth Wright's anticipations be confirmed, a great step will have been taken towards improving health conditions on the mines, where the deaths from pneumonia among the native workers exceed and overshadow those from any other cause. It may here be recalled that at the recent annual meeting of the Chamber of Mines, Mr. H. O'K. Webber, referring to this question of pulmonary disease among natives, said that Sir Almroth Wright and his assistants had been working for several months here, and Mr. Webber felt sure that it would soon be proved conclusively that his investigations and his inoculations had been the means of reducing not only the mortality, but also the incidence of the disease of pneumonia to a reasonable figure. While the death-rate from pneumonia in the past among mine natives has been high, latterly it has been reduced to a fairly low figure. In this evidence of activity, we have an effective counterblast to the statistics of tropical native mortality, quoted by the Minister of Native Affairs recently in the House of Assembly. Mr. Burton's figures were so hotly followed by denials from the mines and corrections from the author himself, that the wiser course seems to lie in refraining from any comment on them at all. Another, and not less important aspect of the health campaign on the Rand, was illustrated by Mr. P. L. Jourdan, in his reply to the discussion on his important paper dealing with the water and ventilation cure for the dust evil. Mr. Jourdan's remarks are given in full in another part of this issue, and they may be said to round off very effectively the extraordinarily valuable series of views elicited from all ranks of mining men on the question. Mr. Jourdan was able to correct several misstatements made in the course of the discussion, and to testify to the zeal and increasing interest that is being taken in the question by mining and mechanical engineers as evidenced in at least two new inventions to cope with the trouble. The whole matter is now in the hands of a standing committee of experts, which, *pace* Mr. Creswell, is well and carefully chosen, and in a little while we hope to see progress in the anti-phthisis struggle rival that in the anti-pneumonia section of the health campaign.

THE RESPONSIBILITIES OF RAND AUDITORS.

Some remarks made by Mr. W. Pott at the recent meeting of the East Rand Proprietary Mines have raised the question of the duties and responsibilities of auditors. It is only fair to Mr. Pott to state at once that the report of his speech, as presented in the papers, did not quote him exactly, if we are to judge by the official account of the proceedings at the meeting. In view of that fact, as well as of the no doubt well-considered reluctance of the profession in question to take the matter up, we are loth to interfere. However, as the questions raised are of very great interest to shareholders in general, a word of comment may be offered, without dragging in Mr. Pott on the one hand or any particular company and its auditors on the other. These questions may be enumerated as (1) Are our auditors sufficiently independent of the directors to put the interests of shareholders first? (2) To improve matters in that respect, should auditors be appointed by order of Court, or, alternatively, given a fixed appointment for a number of years? These questions, it will be seen, resolve themselves into an allegation of lack of independence shown by auditors, and suggestions for remedying that evil, supposing it to exist. On the first question, we may expect the auditors unhesitatingly to join issue. They will say that the auditor is not the critic of the management of a company, but of its accounts, that he is the "watch-dog of commerce," not a bloodhound seeking criminals, nor "a bull in a china shop." They will tell you that his real work is done behind the scenes, in persuading directors to meet his wishes, and that he studies and protects the best interests of the shareholders by so doing. It is, of course, the desire of every board of directors to have a clean certificate at the foot of their accounts, and they will go a long way to meet the auditor's reasonable views in order to avoid the least qualification. Thus it is that by persuasion and the exercise of those valuable faculties of an accountant—tact and diplomacy—a better result is achieved than if the auditor were to adopt an aggressive attitude and issue a damaging report. It must not be forgotten that auditors' reports are taken very seriously, and if, as is sometimes alleged, shareholders do not grasp their full purport, the Press is not backward in enlightening them. It is admitted that occasionally the auditor is influenced by personal considerations, but there is in the great majority of cases only a conscientious desire to do his duty, and to avoid any unnecessary publicity that might unfairly damage the company in the eyes of the public. The auditor's responsibilities are great, and he is often placed in a most invidious position. While he is technically supposed to represent the shareholders, he is, in fact, largely at the mercy of the directors whose accounts he has to criticise, and, further, the shareholders, who might be expected to support him in the faithful discharge of his duties, are usually the first to desert him when he has anything to say which is unpleasant to the board of directors. One financial critic well says: "If shareholders procured the auditors whom by their stupid apathy they deserve, they would be represented by a class of auditors far inferior to the class which they do fortunately possess. At the root of any shortcomings there may be in our system of audit lies the apathy of the shareholder." The suggestion for a remedy of this evil was that auditors should not be subject to removal without the sanction of the Court, but this does not meet with much acceptance, the feeling being that the introduction of bureaucratic interference would not be appreciated either by auditors or shareholders. The alternative suggestion appears to find equally small support. The fact is that auditors succeed in getting along tolerably well in their delicate position, and the cases where troubles arise are remarkably few. Indeed, the exceptional cases alone come to our notice, and the relatively vast amount of work that is well and faithfully performed is seldom adequately recognised. On the whole, it seems to us that no case has been made out against the auditor, though we are prepared to hear his critics in reply.

THE CROWN MINES' NEW REDUCTION PLANT.

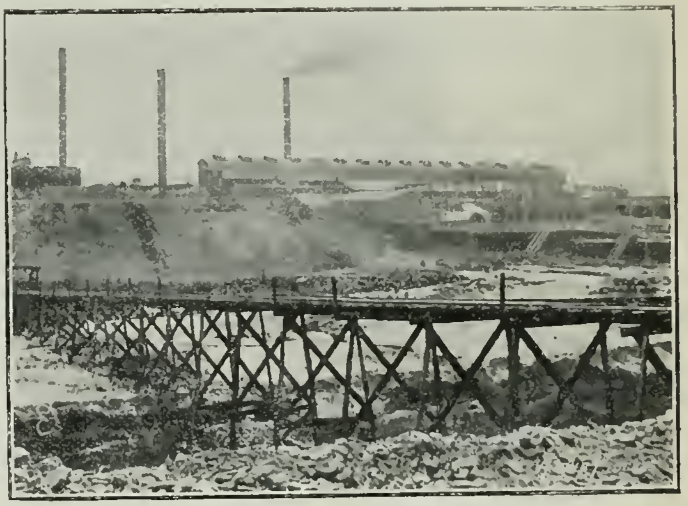
A Thoroughly Modern and Well-Arranged Mill—The Tube Mill and Cyanide Plant—Transport Facilities Between Various Units.

Some of the tangible results of the heavy capital expenditure incurred at the Crown Mines during the past twelve months or so are to be seen in the great 160 stamp mill and accessory reduction plant which has been running continuously since the 15th February last. The official opening, however, took place as far back as the 28th October last, when milling operations on a preliminary scale actually began. To-day there are 110 stamps dropping out of 160, and nearly the whole of the reduction plant may be said to be fairly under way, the old mill and cyanide plant having been closed down. It is perhaps incorrect to say that the old cyanide works have been put out of action, for although the main operations of cyaniding are no longer carried out there the vats are still being used for other purposes in connection with the new plant.

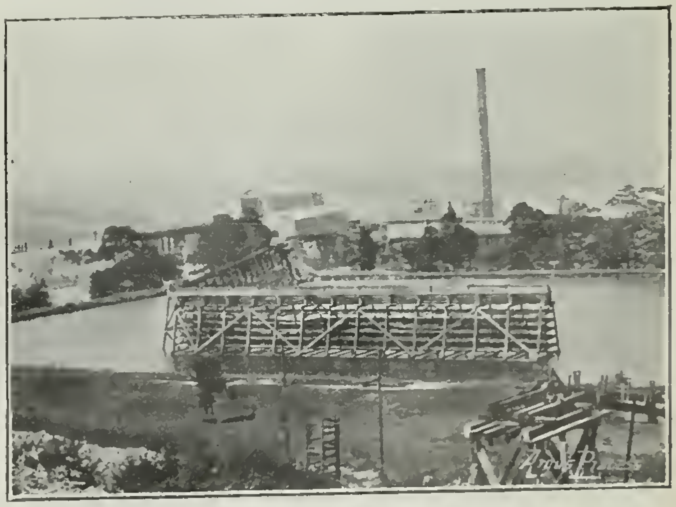
The 160 Stamp Mill.

The new 160 stamp mill is shown in one of the accompanying illustrations. It is situated a little to the south-west of the South Rand shaft, or No. 5 shaft as it is generally called, near the site of the old Crown Reef mill. In the picture there is seen the embankment along which ore is conveyed by 45 ton ore hoppers from the crusher station. The mill itself is largely hidden from view, but it may be mentioned that the Butters plant is to the right and the cyanide plant to the left of the mill as it appears in the illustration. The stamps have a falling weight of 1,670 lbs., and each set of 10 is driven by a separate motor. In accordance with present day practice there are no plates in the mill. The pulp from the mortar boxes is lifted by 12-inch Robeson-Davidson pumps for distribution to 10 tube mills. There are six of these erected at present, the dimensions being 22ft. by 5ft. 6in. An interesting variation from the ordinary pulp thickening arrangement is in use, similar to a method adopted at the Modder B. new mill. The overflow from the main cone flows to a second smaller one adjacent to it at the feed end of the tube mill. The underflow from this secondary cone passes with that from the primary cone to the feed launder. The overflow runs down a launder to a third cone, also of comparatively small dimensions, situated near the discharge end of the tube mill. The underflow from this goes directly to the amalgamated plates and the overflow joins the main discharge from the plates, which is lifted by a 12in. Robeson-Davidson pump to the set of secondary classifiers which return the oversize which requires re-grinding. There are seven amalgamated plates to each tube mill. Originally they were designed with shaking gear attachments, but it was finally decided to keep the plates stationary. The finished pulp from the set of secondary classifiers just mentioned flows over to a further set of classifiers, which separate sand and slime for cyaniding. The sand is discharged by launders to five collecting tanks, each 50ft. by 10ft. 6in., fitted with Butters and Mein distributors and rim overflow. One of these tanks is shown in the foreground of the illustration which portrays the sands plant. The collected sand is discharged on to a pair of conveyor belts, which deliver in turn on to a cross belt, and the sand is thus carried to a main belt which leads to a double balanced Blaisdell distributor, feeding right and left into adjacent tanks. In the picture the cross belt and main conveyor to the Blaisdell apparatus are clearly shown. The treatment tanks are 12 in number, the dimensions being 50ft. by 12ft. The treated sand is discharged into trucks and so sent to the dump. The overflow slime from the classifiers flows to five 56ft. by 12ft. slime collectors, is withdrawn in charges for the Brown agitators, and finally passes to the Butters vacuum filter plant for the recovery of the gold solution. The slimes plant is to the left of the sands tanks in our picture, but does not appear in the illustration.

South Rand Shaft and Crusher Station.



View of the Old Mill.



View of the New Mill.

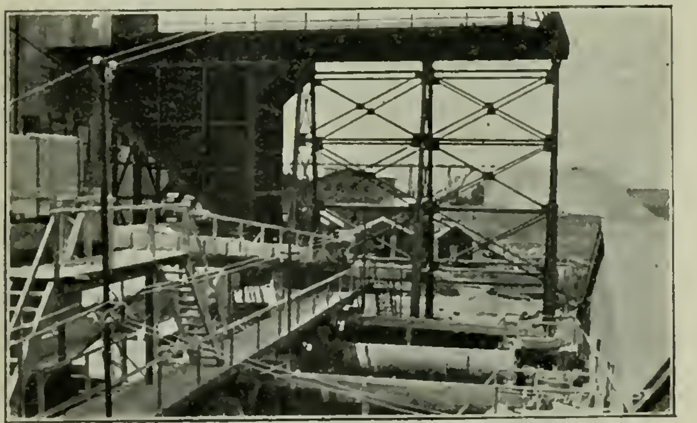
Extractor House.

There are 17 boxes in the extractor house, double and made of iron, similar to those at the City Deep, with side launders for cleaning up purposes. In this building are the usual solution pumps and pumps for draining the tanks, two 8ft. by 10ft. acid lead lined tubs with stirring gear, a Johnson filter press for cleaning up, Betty zinc lathe, tool sharpener, etc.

Cyanide Plant.

Slime Pump House.

Here are three 11in. Rees Roturbo return water pumps for supplying the mill, two 7in. sludge pumps for handling slimes, one 5in. high lift Sulzer and one 5in. Tangye pump for dealing with solutions, and two 6in. low-lift Sulzer pumps for handling the solutions produced by the Butters plant. Each of these various pumps has a separate motor drive. A Belliss and Morcom air compressor is in use for supplying air to the Brown agitators and Butters tanks. Mention was made earlier in these notes of the later uses to which the old cyanide plant has been put. It may be explained that the four 40ft. by 10 ft. upper collecting tanks have been converted into slime solution clarifiers, and the lower cement treatment tanks into sumps for storing solutions. The whole plant has been designed on the most modern lines, and in accordance with recognised methods of ore treatment. There is, in other words, nothing of an experimental or tentative kind in the work, and the whole is a worthy unit in the great scheme of gold winning which has been proposed for the Crown Mines when the preliminary operations now in progress above and below ground are completed. The works are connected by rail with the two crusher stations at the No. 5 and No. 7 shafts, which are each connected with the other and, also, with the old mills. The ore hoisting sections and the recovery sections of the mine are thus linked up in such a way that every facility is provided for the transport of the ore over the surface from and to any required point. In order to secure this end a considerable expenditure has been incurred in the laying of the main lines of railway, and it can scarcely be doubted that the expenditure will prove in the near future to have been fully justified. In the picture which shows the crusher station, now in progress of completion, at the No. 5 shaft there will be seen a line of railway on the extreme left, which goes to the old mill, a second line in the centre which leads to the crusher station at the No. 7, or western shaft, and a third which connects the No. 5 shaft crusher station with the new mill. Within the field of the picture the three lines meet each other, and thus the connection between the several units of the hoisting, crushing, sorting and recovery sections is conveniently effected. The crusher station at the No. 7 shaft is completed, and that at the No. 5, or South Rand shaft, is in progress, as already remarked. Each of these is worthy of a special description, which we propose to give at a later date.



Tube Mill Plant.

The new mill, it may be added in conclusion, takes the place of the old Crown Reef mill section of the amalgamated crushing plant, which is, of course, still available for crushing purposes when required.

Bucks Reef.

Mr. J. E. Maguire, resident engineer to the Bucks Reef Gold Mines, says:—The results of operations on the mine for the year 1911 have been disappointing. As both the Prestwood and Bucks shafts on the bottom levels are over 100 feet from the reef, and as this distance will be greater in the levels below, the starting of underground inclines in both mines should be considered as early as possible. All work has been stopped on the Beaufort, as results obtained in this section were poor. Further work must be done on the Bucks West before the nature of this shoot is clearly disclosed. Developments on the 2nd and 4th levels have shown a very erratic ore body. Unless the Prestwood and the Bucks West shoots open up more favourably in the next few months, it will be hardly possible to keep the mill fully supplied with ore throughout this year. From the position of the mine at the end of the year, both as to developments and ore reserves, the working results for the current year may be expected to be even less favourable than those for 1911.

RECENT RESULTS REFLECTED IN MINE PROFITS.

A Critical Examination—Interesting Fluctuations and Their Significance—Some Qualifying Circumstances—Substantial Advances in "Gold Fields" Profits.

DESPITE the short month, the "Group Profits"—that is to say, the profits of Rand mining companies directly under the control of the more important Mining Houses or Corporations—amounted to just under £813,000, as compared with less than £812,000 in January. On the other hand, the February returns constitute a decline on the December figures. To put the matter exactly, it may be stated that the December group profits were £860,761, those for January £811,637, and for February £812,946.

GROUP PROFITS IN THE AGGREGATE.

As to the different groups, the following figures are instructive:—

	Dec.	Jan.	Feb.
Rand Mines	£215,000	£206,122	£209,989
Eckstein Group	233,201	221,326	213,242
Gold Fields	106,552	101,429	111,697
Farrar Anglo-French ...	99,106	83,223	89,808
Albu	66,341	62,797	48,400
Barnato	57,760	59,227	58,273
Neumann	52,012	44,280	46,072
Con. Mines Selec. ...	20,144	21,373	23,223
Goerz	10,675	11,860	12,242
Totals	£860,761	£811,637	£812,946

ECKSTEIN MINES.

Taking the companies under the control of the Central Mining and Investment Corporation, one finds two of the five subsidiaries earned increased profits, the Ferreira Deep and the Nourse Mines. The former company declared a profit of £32,588—£10,000 in excess of the January earning, and it would seem that the underground difficulties with which the management of this company have been confronted of late are being satisfactorily surmounted. The Nourse Mines profit is only a few pounds higher at £19,00 The Crown Mines, despite the running of 40 additional stamps, earned £108,498, as compared with £110,015 in January, and £109,608 in December. It should be explained that these 40 new stamps were the first heads to be dropped in the new 160-stamp battery. The usual absorption and circulation of gold has to run its course, and hence the lesser profit earned, notwithstanding the larger equipment at work. There are now 110 stamps dropping in the new battery.

The Durban Roodepoort Deep's profit was a little less at £4,714 and the Rose Deep with £31,492 is nearly £2,000 down on the month. The Geldenhuis Deep, where a change in management has been effected, hung up 120 stamps on what is now known as the North section during the month, and the profit at £13,695 was between £3,000 and £4,000 lower, a decline which is not very great having regard to the fact that a large portion of the equipment was idle. In this connection it should be remembered that the old Geldenhuis Estate mill has been hung up, which accounts for the decline in stamping capacity above-mentioned. Of the other eight Eckstein companies two record improvements, but the returns exhibit but little fluctuation, and the six declines are probably simply the result of lesser mining time on a short month. The Ferreira, which is a mine approaching the end of an exceptionally brilliant career, earned £11,208, or about £1,000 less than in January. The Robinson announces a profit of £70,000, only £50 less than in January, and the Village Deep—a mine that has been recording consistent advances in profit of late—earned £22,083, as compared with £22,535 in January. The Village Main Reef, mainly because of an acute shortage of native labour, dropped from £33,737 to £27,882, the December profit being £38,283. This mine is still very short of labour, but the position in this regard is steadily improving. The New Modderfontein earned £35,000, or £219 more than in January, and the Bantjes, with ten more stamps working declared £6,022, as against £5,438 in January, and £5,608 in December. The City Deep (£19,547) and the Modder B. (£21,500) record very little variation, considering the shorter month.

GOLD FIELDS IMPROVEMENTS.

The Consolidated Gold Fields record the profits of eight producing mines, six of which announce larger earnings. In the Knights Deep mill 5,080 less tons were crushed in February than in January, and the profit was £18,351, as compared with £20,984. The Luipaardsvlei Estate declared £2,910 in February (this sum including £1,123 net proceeds from 456 ozs. of gold from accumulated slimes) and £3,332 in January. The Simmer and Jack announces an improvement of £2,000, and the Sub-Nigel made £851 as compared with £379. The Robinson Deep had ten more stamps at work, and put on £1,200. The Simmer Deep and Jupiter each employed five additional stamps, and show very substantial improvements, as the following figures demonstrate: Jupiter, January profit £1,616, February £5,440; Simmer Deep, January profit £1,001, February £4,754. In each case the profit included over 300 ozs. of gold applicable to the January output. But perhaps the surprise packet of this group is the Simmer East, which has gone into liquidation and announced £2,928 for February, as compared with £887 in January and £838 in December.

THE FARRAR ANGLO-FRENCH GROUP.

The East Rand Proprietary, despite expectations to the contrary, improved to the extent of £8,500, but the New Kleinfontein records a decrease of nearly £2,000.

CONSOLIDATED MINES SELECTION.

The Brakpan Mines property of the Consolidated Mines Selection Company earned £23,223 for February, £21,373 for January, and £20,114 in December. This gratifying improvement is, we understand, likely to be maintained for the next month or two at any rate.

HOW NEUMANN MINES FARED.

Turning to the Neumann group, an advance of £1,300 in the Wit. Deep (£13,707), as was foreshadowed, is gratifying. On the other hand, the Knight Central hung up ten stamps, and a heavy fall from £6,268 to £2,666 is announced. We learn that there has been a falling off in stope face values of late at this property. The Consolidated Main Reef (£7,004) records a small advance, whilst the Main Reef West and Wolhuter maintain the profits of the preceding month at £7,484 and £15,036 respectively.

LITTLE VARIATION IN THE BARNATO GROUP.

In Barnato returns unimportant declines are recorded by the Consolidated Langlaagte (a company which may be expected to achieve much better things at an early date), Glencairn, New Rietfontein, New Unified, and Witwatersrand. On the other hand, small increases are registered by the Ginsberg and New Primrose. The returns of this group show remarkably little fluctuation, but the daily rate of earning was, of course, much better in February than in the 31-day month of January.

ALBU MINES RETURNS.

The Albu group records all-round decreases, as the following table shows:—

	Jan.	Feb.
Aurora West	£3,030	£2,502
Cinderella Consolidated	2,628	402
Meyer and Charlton	14,991	14,386
Roodepoort U.M.R.	5,856	3,209
Van Ryn	25,187	23,030
New Goch	7,533	3,164
West Rand Consolidated ...	3,572	2,707

It is explained that at the Cinderella Consolidated this low profit is due to small tonnage owing to shortage of native labour, which is now being overcome. The New Goch profit was reduced in consequence of small tonnage, due to unfavourable underground conditions, which are expected to be of a temporary nature. A fall of grade in main reef stopes is responsible for reduced profits at the Roodepoort United.

THE GOERZ ANNOUNCEMENTS.

Three of the four productive concerns under Goerz control exhibit improvement. The Lancaster West earned £984, or £184 more than in January, but this compares unfavourably with the £2,713 announced in respect of the December operations. The May Consolidated records a small advance, and so does Geduld. This latter concern, as we remarked in our last issue, may be regarded as having turned the corner of a very chequered career. The Princess is still in the transition stage, and a further loss of £1,678 is announced. It is, however, encouraging to note that the loss on working is being reduced, and we look forward to this company reaping the fruits of amalgamation, and earning fair profits in the near future.

A SATISFACTORY AGGREGATE.

Considering the shorter running time and the scarcity of labour at a number of mines, the February profits may be adjudged eminently satisfactory, and they seem to augur well for the earning of the current month.

SELECTIVE MINING AND VALUATION ERRORS.

Some Interesting Pointers—The Case of the Modder B. and Brakpan.

ARE the mines of the Witwatersrsand milling rock of a grade in excess of the average value of the ore in the mine? This is a question that has been asked frequently of late, and in many instances it has been answered by mining critics in the affirmative. Whether the Rand as a whole is mining and milling at the present day ore of a profitable value in excess of the average of all the ore remaining in the fields is difficult to say, but in all probability the ore to be worked in the future is both of lower grade and of lesser profitable value than is being worked at the present time, because there are vast accumulations of low grade ore and because the tendency is to work ore of less and less value per ton. A great deal of this low grade ore has of necessity been exploited during the development of blocks of profitable value, and should economic anticipations be fulfilled a great deal of this ore will in the future be worked at a profit. It may be recalled that in replying to Sir E. P. Solomon's queries as to the position and prospects of Crown Mines in December last, Mr. Samuel Evans, the Chairman and Managing Director of the company stated:—

> It has been repeatedly stated in the Press that the company is deliberately mining ore of somewhat higher grade than is justifiable. Now it is true that we are taking a larger proportion of ore from the eastern end of the property than will be the case after the completion of the present programme, but under the circumstances no other course was possible. It was foreseen at the outset that during the transition stage we should have to mine ore better in value than what was likely to be the average of the whole property, because in order to maintain the tonnage milled we should have to continue to take ore from the areas developed and to use to their fullest capacity the shafts, haulage ways, plants and appliances existing in the middle of 1909. These conditions could only be modified by pushing ahead as rapidly as possible development in the western and lower sections and making provision for the handling of a larger tonnage from these areas. This is precisely what is being done. A great deal of development work has already been accomplished in the South Rand, Langlaagte Deep, Langlaagte Royal and Paarl Central sections; double stage hoisting has been established in the Langlaagte Deep shaft, and by the middle of next year the South Rand shaft and the 13th level will come into operation, so that it will then be possible to feed the reduction plants with rock approximating the average value of the ore reserves. Obviously this will involve a gradual reduction in the yield per ton to the neighbourhood of 7.1 dwts. (29s. 10d.), as foreshadowed in the reports presented to shareholders prior to the amalgamation; but on the other hand we are justified in concluding that, on the completion of the amalgamation programme, the working costs will also be substantially reduced owing to the concentration of the company's mining operations and to the fact that the costs are unduly high during the period of transition.

We observe that similar criticism has recently been directed against the Modder B. mine. The Johannesburg correspondent of the *Mining Magazine* in the last issue of that excellent periodical writes:—

> The 80 stamps and 5 tube-mills, up to the end of November, crushed a total of 47.360 tons, which yielded 18.563 ozs. fine gold or 7.83 dwt. per ton crushed. At the end of 1910 the ore reserve was estimated at 2.788,000 tons averaging 7.0 dwt., which together with 610.000 tons of "unpayable ore" of an average of 3.4 dwt. per ton made a total of 3.398.000 tons averaging 6.4 dwt. The grade of the ore mined up to the present is therefore much above the average of the ore reserve. This may either be due to a selective policy on the part of the management or to the fact that errors in estimating the value of the ore reserve may easily occur in a mine developed on the big-block system. If the latter reason be the cause, the error is fortunately for the present on the right side, as more gold has already been obtained than is called for.

In a lengthy article on the Modder B., appearing in this journal a few weeks ago we dealt with the risk incurred in the estimation of values and control of the average yield by reason of the adoption of the policy of development in vogue at the mine. It may be observed that the recovery in January last was as high as 7·93 dwts. per ton, so that apparently a very considerable tonnage of ore of a grade above the average estimated for the reserves has been treated. Whichever conjecture of the *Mining Magazine's* is correct, we regard the present position of the most easterly of the Eckstein mines as being quite satisfactory. The mine has started up in a most promising manner. Practically the whole of the large equipment was brought into operation from the commencement, and a selective policy in the earliest stages of production could easily be justified. On the other hand, if there is an error in estimating ore reserve values it is as our contemporary's correspondent points out, on the right side and constitutes a decided "bull" point in favour of the company. In this connection it may be remarked that similar criticism to that given above was directed against the Brakpan mines, a property which has earned improving profits practically since commencement of milling.

Abels Kop Gold Mines.

The third ordinary general meeting of the shareholders in the Abels Kop Gold Mines, Ltd., was held in Kimberley last week under the presidency of Mr. Alpheus F. Williams. The minutes of the previous annual meeting having been read, and an audited statement having been submitted, the Chairman, before moving the adoption of the report, called upon the Secretary to read reports from Mr. Arkell, General Manager, and Mr. Arundale, Acting Managing Director, as to the position. After hearing these, the Chairman said the question to decide was whether the company would incur extra expenditure and make what was now an unproductive proposition a profit-making concern. It was stated that two bonds had been passed for the respective sums of £2,500 and £7,500 in favour of Dr. Ashe and Messrs. A. Gunning and T. Rodger, but that these gentlemen were not prepared to put any further money into the concern. It was for the shareholders to decide whether they would act upon the recommendation of the reports, and by putting in, say £150 per month for the next four or five months, put the concern on a profitable basis. No proposition being forthcoming, it was decided at an extraordinary meeting immediately held to voluntarily wind up the company, Mr. J. D. Tyson being appointed liquidator.

UNDERGROUND REFORM ON THE RAND.

Mining Methods of Other Fields Adopted—A Leading Consulting Engineer's Views—The Curse of Insecure Employment.

At no time in the history of the Witwatersrand Gold Fields has the need for underground reform been more self-evident, more insistent, and more essential than at present. The Rand is faced with a complexity of problems which it is imperative should be solved. The machinery of new ideas and new methods has within the past few years been set going, and it is absolutely necessary that this machinery shall have full play and be allowed to work out the salvation of the industry. Summarised, the results of last year's operations mean higher tonnage, increased working expenses and lesser dividends. If the examination is carried a little deeper it will be found that the fetish of striving for the minimum working costs to the detriment of other and more vital considerations has been well nigh eliminated from the programmes of mine managers, and it will further be patent that the relatively unsatisfactory profits secured by the largest of the mines have been due to the non-completion of a thousand and one details of re-organisation included in the new schemes of amalgamation and general remodelling of underground operations.

The Kaleidoscopic Rand.

During the past few years the Rand has been undergoing a change; a great and revolutionary re-organisation of all the economic atoms which go to constitute the body and life of the industry. The outcrop areas of the Rand are fast approaching exhaustion; it may be said that the epoch of shallow working has vanished, and the industry is now in the throes of those deep level problems, some of which were foreseen vaguely two decades ago by men like John Hays Hammond and the late Major Lewis Seymour. Engineering, both mechanical and electrical, has responded nobly to the calls that have been made on these respective branches of the greatest science of commerce. Electric stage winding is no longer the knotty problem and the unknown quantity that it used to be; as a matter of fact, there can be no doubt as to the valuable part this means of hoisting is to play in the deeper levels. Electric stage winders are now at work at and in many of the most important mines along the Rand, and are giving every satisfaction. As to the ventilation, the small and gradual increase in underground temperature as a greater depth is reached has been offset by the installation of fans. Save in a very few mines the draining of the deeper levels has occasioned but little trouble and has not placed any heavy tax on capital expenditure in regard to pumping plant.

Inauguration of Modern Mining Methods.

It will be seen that the more important of the obstacles to engineering efficiency and ventilation of the deeper levels have been gradually conquered, and a high state of underground mechanical efficiency has been evolved. Where the Rand has to reform itself and set its house in order is in the organisation and handling of underground labour, the removal of the dust evil, and the improved and more extended adoption of the general principles of mining. As to the latter anyone who takes the trouble to analyse recent consulting engineer's and other technical reports will quickly ascertain that new methods are being put into practice. With the decline of the outcrop sections it has become necessary to concentrate work on the deeper areas of the Main Reef series. The driving of main haulage levels right through a property, the gravitation of ore down to main loading stations, the marshalling of men and ore around underground marshalling stations, the driving of levels off the reef where the course of the ore body is sinuous and broken, and the tapping of the reef by means of box holes are amongst the later tendencies of Rand mining practice. In the case of the New Modderfontein there has been something of a return to early-day methods in shaft sinking, and for all the adverse criticism that has been directed against circular pits on the Witwatersrand we hazard the opinion that when full details and expenses of the New Modderfontein shaft are available it will be found that the sinking costs of this shaft compare most favourably with rectangular shafts sunk on other portions of the Witwatersrand Gold Fields. Many of the old shafts of the Rand are rapidly sinking into disuse, and hoisting operations are being concentrated at main shafts of large dimensions. The critical examiner of Transvaal mining methods can scarcely fail to realise that the Rand has had far too many shafts in the past to secure the best return on capital invested. One can only wonder that the more modern ideas prevailing to-day, which are the alphabet of mining in other fields, were not brought into action here years ago. After all the driving of a main haulage level and concentration of ore cars at this level has been practised in English collieries ever since the birth of modern mining methods in the coal fields of England.

Better Labour Organisation Needed.

But if the Rand is being reformed in the matter of mining practice, it is certain that the real work of re-organising underground labour both white and black is just beginning. Speaking to a leading consulting engineer the other day, we gathered that in his opinion the efficiency of white labour on these fields is very low, that remarkably few officials really knew how to get good work out of their men, that the great majority of the Rand's good miners had either died of phthisis or been frightened away because of the ravages of this disease and that a great economic necessity was the education of underground workers up to the standard of what would be adjudged mining efficiency in other fields.

Insecurity of Employment.

For our part we believe that less shifting around of men would achieve an incalculable amount of good. It is a sorry truth which should be resolutely faced that the underground employees of the majority of mining companies feel an insecurity as to the future, which is far from conducive to good work. It is also true that men are "sacked" and transferred or moved from one portion of a large property to another and put on vastly different work without apparent rhyme or reason. There are admittedly a large number of "wasters" who wander from mine to mine until all the mine captains and shift bosses along the reef know them to their cost. But on the other hand we know of instances where good men without a blemish on their characters, and who have performed long and useful services have been thrown out of employment or put on other work for which they are wholly unfitted at a few hours' notice. It is difficult to eliminate spite and unjust favour from any industry, and time has proved it to be a matter of exceptional difficulty on the Witwatersrand. But it is absolutely essential that on a field where close on 200,000 admittedly "unskilled" native workers are employed, those who are placed in authority to organise should be men of efficiency with a reliance on their own ability and the fairness and justice of their employers and their immediate superiors. This sense of insecurity is the curse of the Reef to-day. If statistics were obtainable as to the moving about of white miners, they would come as an even greater surprise to the populace at large than did Mr. Kotze's sensational figures as to the shifting about of mine managers.

NORTHERN TRANSVAAL COPPER.

Pushing Ahead with Development at Messina—Mill to be Largely Extended—New Shaft being Sunk—Activity at the Malgo Property.

Development is being pushed ahead at the Messina copper mine with all possible despatch, so that when the railway reaches the property it will be possible to enlarge the output and generally extend operations in a minimum of time. It may be recalled that at the 30th June last the estimated ore reserves blocked out within the developed sections amounted to approximately 102,000 tons of 10 per cent. copper, and it may be anticipated with confidence that the next annual report will exhibit a substantial increase on these figures. At present the mill is running on development rock only, no stoping operations being engaged in for the time being. Last month the mill ran for nine days only, and secured a production of about 80 tons of concentrates. The output of the company at present is just sufficient to give the transport riders bringing up material, etc., for the new construction work sufficient ore to take back on the return journey to rail head.

The Present Mining Policy.

The property is being rapidly opened up, and the present policy of mining pursued there favours the driving of main straight levels and the tapping of the lode by means of box holes. The idea of this is not with a view to the installation of mechanical haulage, but in order to reduce tramming costs.

Sinking a New Shaft.

In conjunction with the work of extending the Messina company's operations, a new shaft is being sunk about 50 feet away from the existing main shaft. This new pit will be sunk with all despatch, and it will constitute a very important factor in the further development of the mine, the intention being to utilise one shaft for hoisting ore, whilst at the same time the other is being carried down to exploit another level.

Enlargement of Equipment.

Designs for a new mill are now being got out, and it is anticipated that in about eighteen months time the Messina Company will be treating about 500 tons per day. In the last annual directors' report it was stated that in view of the completion, at an early date, of the railway now under construction, the operations at the mill would, for the present, be limited to treating ore obtained from development, and efforts would be concentrated on increasing the reserves of ore by opening up the mine as rapidly as possible so as to be in a position to at once undertake a large output on the advent of the railway. It was proposed to increase the existing mill by adding further units up to a capacity of 8,000 tons per month. The issue of £250,000 of Debenture Stock, as authorised by the special meeting held 3rd July, had, the directors stated, been successfully placed, and the company was therefore in a strong financial position, with ample funds for the erection of a large and up-to-date mill and for the prosecution of necessary developments. It would appear, therefore, that a further extension of milling equipment has recently been agreed upon.

The Coal Seam.

The company is opening up the coal seam in the vicinity of the property, and there can be no doubt that this will constitute an important factor in its future history. It will, of course, have an important influence on the smelting policy. As was stated in the last annual report, the company will be in a position to ship a large output of concentrates of about 40 per cent. copper when the railway reaches the mine. It will then be thoroughly investigated whether profits can be further increased by smelting these concentrates into a matte or into blister copper at the mine, and, of course, the recent discovery of coal about fifteen miles to the south-west of the Messina Mine has a satisfactory bearing on the question.

Other Ventures Awaiting the Railway.

Although there is known to be a vast copper-bearing area in the vicinity of the Messina Mine and, generally speaking, throughout that portion of the Zoutpansberg lying in proximity to the Limpopo River, but little work is proceeding at the present time outside of Messina. It seems that the majority of syndicates and prospectors are awaiting the advent of the railway line before engaging in any very active plans of campaign, an attitude which can very easily be understood. At the Malgo property, however, a fair amount of work is proceeding. A manager is on the property superintending operations. He has a fair number of natives at work under him. These are engaged in sinking shallow shafts, and in generally opening up the mine with a view to its further development as the railway approaches the property.

Clydesdale Collieries.

Last Saturday morning over a hundred members of the Chemical, Metallurgical and Mining Society visited the Clydesdale Company's colliery in the Orange Free State. The party was received and conducted over the property by the mine staff. A tour was made of the surface plant, which was much admired, the general verdict being that the plant was substantial and well arranged. The extensive use of freestone, quarried on the spot, gives the buildings quite an unexpectedly permanent and substantial appearance. The seam of coal seen in the workings was reported to be over 32 feet thick, of which, however, after numerous trials, it has been deemed best to work the lowest nine feet only. The property of the company is said to be nearly 18,000 acres in extent, so that if the seam of coal extends over the whole area, a thickness of nine feet indicates the existence of saleable coal approaching two hundred million tons. The coal seam has a solid, compact appearance, hard in structure, and in the mine shows a conchoidal rather than a laminated structure. The workings would seem to have been placed in the centre of the coalfield, the coal itself showing signs of improvement upon that until recently worked at Vereeniging. One pound of coal is officially stated to be theoretically capable of converting 10 pounds of water into steam, so that it is much superior to the Springs coal, and comes but little after Middelburg coal in quality. The method of working the coal in the drives is interesting, the upper half being first removed and the lower half then blasted by dynamite, the total waste in smalls and sorting being stated to vary from 15 to 20 per cent.

Hex River Exploration.

The annual ordinary general meeting of shareholders will be held in the office of the secretary, Transvaal Bank Buildings, Fox Street, Johannesburg, on Thursday, 28th March, 1912, at 12 o'clock noon.

Sir Aubrey Woolls-Sampson's party has abandoned its diamond prospecting in close proximity to the Bloemhof alluvial fields. The attempt here was for a pipe mine, and the indications even at 30 and 40 feet depth were most convincing.

A COAL PROBLEM IN THE KARROO.

Unexplained Phenomena in the Nieuweveld—Fissures and Veins of Coaly Matter—Similarity to Occurrence of Asphalt Minerals.

In the latest report of the Geological Commission of the Cape of Good Hope the unsettled problem of the origin of the so-called coal deposits of the Nieuweveld is again struggled with by the geological survey of the Province. Coal, or what was supposed to be coal, of excellent and somewhat unusual quality was found as far back as 1864 or 1865 in the hills to the west of Beaufort West, and has been the object of scientific speculation and commercial disappointment at various intervals ever since. The excellent character of the mineral and its high grade of purity, added to the advantages which would accrue from the finding of a suitable fuel in that part of the country, have made it an attractive object for the attentions of people with mining proclivities for a very long while past, while, still more recently, the attention of the railway department of the Union has been turned to this and other coal indications of the Karroo, with the result that the Director of the Geological Survey of the Cape of Good Hope, Mr. A. W. Rogers, Sc.D., F.G.S., has been induced to spend a great deal of his time in a study of the Nieuweveld deposits. The following figures are the result of some analyses of the mineral in question, furnished to Dr. Rogers from the Government Analytical Laboratory:—

	I.	II.	III.
Ash	6·93	7·83	2·144
Moisture	14·99	2·02	7·46
Volatile hydrocarbons	24·81	23·5	13·03
Fixed Carbon	53·27.	68·7	76·02
Sulphur	·58	1·83	·865

The substance is brittle and bright, and is termed an anthracite by the Director of the Survey. The most interesting, and at the same time extraordinary, feature in connection with it is that it has never yet been found in an ordinary seam, interbedded with the associated rocks. The large amount of work that has been done upon it from time to time has proved that it occupies fissures which run in all directions across the strata, which are sandy mudstones. At Buffels Kloof the mineral occupies fissures which are nearly vertical, while the dip of the enclosing Karroo beds, as everyone knows, is a rather low one. No intermingling of debris from the country rock is observable, although in places small slabs or " horses " of rock are to be seen embedded in the " coal." According to Dr. Rogers, the impression is " that the coal is formed by means analogous to those which brought about the deposition of the quartz in massive veins without successive layers due to gradual deposition on the walls of the fissure."

Some Explanations.

As we have already remarked, numerous suggestions have been put forward, by scientific and unlearned persons alike, to account for the novel phenomena. Among the first, and most frequent, it may be added, was the suggestion that coal had been forced into these fissures in some way from deeper seated and more normal sources, and it has also been advocated, on good authority, that the mineral occupies its present position as the result of faulting. Close observation underground, however, provides many reasons for rejecting these tentative explanations. The idea of clean coal being injected into fissures from unknown sources —for coal seams have not been discovered in that region, which, by the way, offers every facility for their discovery if they actually existed—is almost incomprehensible, and Dr. Rogers says:—" No process of faulting can account for the phenomena; also, there is no question of cracks in an old floor of deposition being filled with coaly matter during the formation of a coal bed on that floor." The alternative is the introduction of the mineral in a liquid form, or in some flowing medium, and, with regard to this theory, it is remarked: " It is difficult to understand how such a substance could behave as a liquid under the influence of heat, for, at any rate at atmospheric pressure, the coal separates into several parts when treated out of contact with air. It may be that the conditions of pressure obtaining at the time allowed the substance to be liquified. If the coal reached the fissure at the time of the intrusion of the dolerite the pressure must have been very considerable, for the present exposures were laid bare by the removal of at least 3,000 feet of rock, probably very much more, by denudation since the intrusion took place."

The Significance of the Phenomena.

To our mind a great deal more importance attaches to the investigation of this geological puzzle than appears to be assumed by the Survey of the Cape Province. Dr. Rogers says:—" The solution of this problem would, of course, answer the question of the commercial value of the neighbourhood as a source of coal." Various methods have been proposed of getting at the truth of the matter, from following the coal-bearing fissures *ad infinitum*, in the hope of striking the source of the deposits, or, at any rate, some seam of sufficient dimensions to warrant mining upon a large scale, to the putting down of boreholes haphazard. Neither of these methods are likely to be sufficiently attractive to those persons who might be called upon to pay the expense of carrying them out, and they may, therefore, be considered as impracticable. At the end of the report upon the Nieuweveld coal occurrences, after having practically admitted that he has been able to arrive at no satisfactory explanation of the phenomena described, the Director of the Survey remarks: " There is some similarity between the occurrences of the peculiar coals in the Nieuweveld region and that of asphalt minerals in veins in the Uinta basin and other areas in the United States, but there is also the difference that in the latter region the veins are not associated with intrusive dykes." It is precisely in this similarity, it seems to us, that the key to the solution of the whole problem lies. The presence of dykes serves to indicate the lines along which an investigation should be made. It has been suggested, by the way, that the coaly matter in the fissures is due to distillation arising from the action of dykes upon coal seams in depth, but the objection of the Survey, if memory serves correctly, is that there are apparently no coal seams in depth, at least in that part of the Karroo. The occurrence of this remarkable deposit, similar to that of the asphalt minerals referred to, and the fact that in the same Karroo measures there are numerous indications of oil associated usually with dolerite dykes, appear to have some relationship which it might be worth the trouble of the Government to enquire into. Hitherto a large amount of money has been spent by individual syndicates in boring for oil in the Karroo, and a great deal of evidence of one sort or another has been collected which might, if properly collated and examined by competent chemists and geologists, lead to conclusions of some value to the country. The tedious examination of the so-called coal deposits of the Nieuweveld has provided no new data that we are aware of, and has led to no useful conclusions.

The Tugela Gold Mining Syndicate is going into liquidation, an attempt to refloat the venture in London having been unsuccessful. Many people who know this district maintain there is payable gold there, and that very rich ore has been found in some comparatively old workings. There are no doubt rich patches to be found in several areas along the river, but up to the present no permanent deposits have been located though a good deal of money has been spent in certain properties. Some hold, however, that failure has been due to the want of properly systematised operations.

ROSE DEEP RESULTS FOR 1911.

Operations Show a Satisfactory Improvement—Increased Profits and Reduced Working Costs—Bigger Tonnage Crushed—The Mining Policy.

The following is a comparative annual return of working expenditure, revenue, working profit and net profit at the Rose Deep in the last two years:—

	Ore Milled.	Yield per Ton Milled.	Working Expenditure.	Working Revenue.	Working Profit.		Net Profit.	Dividends Paid	
	Tons.	Fine Dwts.	Average Cost per Ton of Ore Milled.	Average Value per Ton of Ore Milled.	Profit.	Profit per Ton of Ore Milled.	Total.	Rate per cent.	Amount.
			£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		£
1910... ...	656,500	6.791	0 18 10.246	1 8 5.503	315,276 5 11	0 9 7.257	317.752 4 5	40	280,000
1911... ...	695,100	6.671	0 17 11.247	1 7 11.758	349,029 19 0	0 10 0.511	342,832 9 9	40	280,000

The accounts show that a net profit was earned for the year of £342,832 9s. 9d., making, together with £17,631 8s. 8d. brought forward from last year, a total of £360,463 18s. 5d. This sum has been appropriated as follows:—On account of capital expenditure, £50,499 0s. 5d.; Government tax on profits, £29,964 18s.; dividends Nos. 20 and 21, £280,000. The total amount expended on capital account was £81,055 7s. 8d. This figure exceeded the amount available in appropriation account for capital purposes by £30,556 7s. 3d. The net liability of the company at the close of the year was £4,856 7s. 3d., after allowing for the value of reserve gold on hand £25,700. The directors' report states that at the close of 1910 it was anticipated that the Rand Mines Power Supply Company, Limited, would be able to supply the company's full requirements of electricity and compressed air by about May last. The supply of power commenced in March last, but for various reasons the Power Company has as yet been unable to meet the full requirements of the company, and this has necessitated the running of steam plant in order to make up the deficiency. Arrangements are being made by the Power Company to increase its plant, and it is expected that a full supply of power will be available about the end of 1912.

Consulting Engineer's Report.

The Consulting Engineer, Mr. W. T. Anderson, writes:—The operations of the company for the year ended 31st December, 1911, show a satisfactory improvement over those of the previous year, the comparative profits being £349,030 for 1911, as against £315,276 for 1910. The ore milled yielded a return of 27s. 11d. per ton, a decrease of 6d. per ton compared with 1910. This decrease, however, was more than compensated for by the reduction of 11d. per ton in working costs, resulting in an increased working profit of 5d. per ton, or a total of £33,754 During the early portion of the period under review, work was greatly restricted on account of the labour shortage experienced by the mine in common with others on these fields: had more native labour been available still better results would have been shown. The Rand Mines Power Supply Company, Limited, are not yet in a position to give the mine a permanent supply of compressed air and electric power, but such supply as was obtained during some months of the year has tended to minimise the adverse effect of labour scarcity. Although the tonnage milled amounted to 695,100 tons, or an increase of 38,600 tons as compared with 1910, it was only during the second half of the year that it was possible to keep the mills fully supplied. The development work accomplished amounted to 14,324 feet and disclosed 729,012 tons of ore of an average value of 6.4 dwts. and 22,049 tons of an average value of 2.4 dwts. The upper and older sections of the mine still contain a considerable quantity of ore, and the policy adopted has been to concentrate operations as far as possible in these workings, with a view to their rapid exhaustion rather than run any risk of loss through caving. The payable ore reserves as at 31st December, 1911, were estimated to be as follows:—

	Tons.	Value. Dwts.	Stooing width. Inches.
Main Reef	1,439,959	5.6	63
Main Reef Leader	389,093	6.1	50
Main Reef Leader and Bastard combined	535,708	5.9	53
Main Reef Leader and South Reef combined	678,644	6.8	61
South Reef	626.756	6.0	51
Totals and averages	3,670,160	6.0	57

These reserves may be segregated as hereunder:—(a) Ore in blocks fully available for stoping, 3.244,953 tons, value, 5.9 dwts., (b) ore exposed by driving but requiring some additional winzes or raises for convenience of stoping, 96.585 tons, value 5.7 dwts.: (c) ore requiring some clearing of intervening caved ground, 127,427 tons, value 6.1 dwts.; (d) ore in shaft, safety and boundary pillars, 201,195 tons, value 6.6 dwts.; total, 3,670,160 tons, averaging 6 dwts. Compared with the figures for the previous year, there is an increase of 116,686 tons, the value being approximately the same. In addition to the above it is estimated that there are 474,176 tons of an average value of 3.0 dwts., representing the unpayable reserves in the mine. In this mine the quartzite dividing the reefs is generally of comparatively small width and often permits of two reefs being mined in the same stope, so that, although the values of the reefs published in the quarterly reports may at times appear unpayable, the reefs when worked together give profitable results. The increased use of machine drills was found necessary, even in unsuitable stopes, in order to keep the mills supplied; promising results were obtained from the use of hammer drills. The ventilation of the mine has been materially improved by the installation of two electrically-driven fans. With the object of making the surface plant as elastic as possible, a mechanical haulage system was installed between the Glen and Rose mills, which allows of any surplus ore to be readily transferred from the Glen section to the Rose mill. This arrangement has already proved of great assistance in regulating the crushing. The underground workings generally are in a good condition and the development is well ahead of all requirements. Shaft sinking is completed with the exception of about 50 feet still to be done in the No. 4 shaft. The surface plants are in good order; no capital expenditure of any importance is anticipated. The prospects of your company for the coming year are distinctly promising, and provided the mine is not unduly hampered through labour shortage, improved results may be expected.

Manager's Report.

The Manager, Mr. A. J. Walton writes, *inter alia*: During the year the mine suffered from a severe shortage of native labour, the average number of natives at the mine being only 4.424 as compared with 5.133 for the previous year. This shortage necessitated the running of a number of machines under unfavourable conditions, but in spite of this the working costs show a reduction of 11d. per ton milled. The tonnage milled shows an increase of 38.600 tons on the previous year. Small machines of various types were tried for stoping, but generally better results were obtained from large machines. Hammer drills have been used for drilling "down-holes," and have given excellent results; the number in use will be increased. A long endless rope haulage has been installed on the 7th level connecting Nos. 3 and 4 shafts, which has improved the tramming efficiency in that portion of the mine. There are also 17 small main rope haulages at work in stopes, which have saved a number of boys. The ventilation of the mine has been improved by the installation of two underground fans which are working satisfactorily. The pumping scheme is now completed, and all the main pumps are electrically driven. It will shortly be necessary to instal a new electric pump in No. 2 incline to replace air pumps at present in use. A new coarse crusher has been erected at the Glen Section. A connecting haulage between the two mills was started up early in the year and has been of great benefit, as much more rock was mined at the Glen section than could otherwise have been dealt with. The electrification of the plant has been completed with the exception of a man hoist, which has been removed from No. 3 shaft and is being re-erected at No. 1 shaft. Owing to the insufficient supply of electric current and compressed air, the Glen mill engine and compressors are being worked by steam. A new European change house was erected at No. 4 shaft, and it has been of great service in attracting good miners.

Eight Hours Work Exemptions.

Notice is given that the provisions of sub-section (1) of section nine of the Mines and Works Act, 1911, shall not apply to the undermentioned classes of underground employees, which have been exempted by the Minister of Mines under the powers vested in him:—Underground engine-drivers, underground banksmen, and onsetters.

THE CROWN MINES' ANNUAL REPORTS.

Shortage of Native Labour and Reorganisation of Work Delays the Realisation of Property's Full Possibilities.

The following is a comparative annual return of working expenditure, revenue, working profit and net profit at the Crown Mines, Ltd., in the last two years:—

	Ore Milled.	Yield per ton milled.	Working Expenditure.	Working Revenue.	Working Profit.		Net Profit.	Dividends Paid.	
	Tons.	Fine Dwts.	Average Cost per Ton of Ore Milled.	Average Value per Ton of Ore Milled.	Profit.	Profit per Ton of Ore Milled.	Total.	Rate per cent.	Amount.
			£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		£ s. d.
1910 ...	1,514,000	8.151*	0 18 3.612*	1 14 1.911*	1,200,469 14 11*	0 15 10.299*	1,214,178 3 5	120	1,128,127 4 0
1911 ...	1,618,500	8.380*	0 19 4.058*	1 15 1.975*	1,280,757 16 10*	0 15 9.917*	1,261,345 8 7*	110	1,034,116 12 0

*Note.—Includes Accumulated Slimes and Dump Treatment.

The accounts of the Crown Mines for 1911 show that a net profit was earned for the year of £1,261,345 8s. 7d., making, together with £365,808 17s. 8d. brought forward from the previous year, a total of £1,627,154 6s. 3d. This sum has been dealt with as follows:—Government tax on profits, £132,128 16s.; dividends Nos. 20 and 21, £1,034,116 12s.; balance carried to balance sheet, £460,908 18s. 3d. Expenditure for the year on vertical shaft sinking and equipment amounted to £533,565 1s. 1d., and the balance of mine development suspense shows a net increase of £152,329 6s. 6d. The sum of £300,006 15s. 11d. charged against property represents the sum payable in fifteen annual instalments of £19,979 to the Government in respect of undermining rights of 5·2778 claims acquired as per last report, and £321 15s. 11d. transfer duty and legal expenses in connection with the purchase of Booysens Reserve Township. The accounts disclose net liabilities amounting to £739,610 7s. 2d., after taking credit for the value of gold in reserve, £20,234. The directors' report states that at the close of 1910 it was anticipated that the Rand Mines Power Supply Company, Limited, would be able to supply the company's full requirements of electricity and compressed air by about May last. The supply of power commenced in March last, but, for various reasons, the Power Company has as yet been unable to meet the full requirements of the company, and this has necessitated the running of steam plant in order to make up the deficiency. Arrangements are now being made by the Power Company to increase its plant, and it is expected that a full supply of power will be available about the end of 1912. The report of the Consulting Engineer was printed in full in our last issue.

General Manager's Report.

Mr. R. C. Warriner, the General Manager, writes as follows, *inter alia.*—Mine—The underground operations may be summarised as follows:— Stoping, etc.: From stoping 1,711,906 tons were mined, in addition to which 119,276 tons were obtained from developing faces, making a total of 1,831,182 tons mined, of which 115,776 tons (6 per cent.) were from Main Reef; 818,065 tons (45 per cent.) were from Main Reef Leader; 897,341 tons (49 per cent.) were from South Reef—1,831,182 tons. The stoping width in the Main Reef and Leader averaged 61 inches, and in the South Reef 62 inches. Development work: The development operations resulted in a total of 71,023 feet. No. 1 Shaft Incline was deepened a further 428 feet, making its total depth from the Vertical Shaft 2,168 feet, or 546 feet below the 8th (new 13th or common) Level. This shaft has now reached the plane of the 14th Level, and will only be deepened a few feet further to allow for the cutting of a small ore bin for that level. No. 2 Shaft Incline was deepened a further 109 feet, making its total depth from the Vertical Shaft 2,897 feet, or 44 feet below the 13th Level. It is not proposed to deepen this shaft further, as the ore below the 13th Level in the Eastern Section of the property will be hauled through No. 5 Shaft. No. 3 Shaft Incline—The sinking of this shaft is also completed. No. 4 Incline Shaft was deepened a further 36 feet, making its total depth 1,983 feet, or 60 feet below the bottom level (Old Crown Deep 5th Level). The small footage accomplished during the year has completed sinking work at this shaft. No. 5 Vertical Shaft was deepened a further 669 feet, making its total depth 3,434 feet, or 180 feet below the 19th Level. Sinking at this shaft has now been carried to a sufficient depth to command all the ore in the Eastern Section of the property North of the large South Rand dyke, and no further sinking will be necessary for a great many years to come. By cross-cutting through the dyke on the 19th Level, the value of the ore on the South side of the dyke can be proved in a comparatively few years' time. No. 6 Shaft Incline was deepened a further 155 feet, making its total depth from the Vertical 1,466 feet, or 56 feet below the 13th Level. The sinking at this point is also complete. No. 7 Shaft Incline—At this shaft, where three-stage winding will ultimately be installed, no sinking was done during the year. The engine chamber for the third stage winding was cut, also the landing station at the 13th Level. In addition, a small footage of rising from the 13th Level, amounting to 41 feet, was done in the shaft proper. For many years this will be the only shaft at which further sinking will be necessary. Of the total footages accomplished, 42,176 or about 59 per cent., were in reef formation, the reef disclosures being: Main Reef—Distance exposed 6,819 feet, width 38 inches, assay value 3.0 dwts.; Main Reef Leader—Distance exposed 18,550 feet, width 24 inches, assay value 17.3 dwts.; South Reef—Distance exposed 16,807 feet, width 24 inches, assay value 13.6 dwts. The estimated tonnage of ore exposed by drives and stoping in undeveloped ground was as follow:—Main Reef—Payable 43,819 tons, unpayable 6,155 tons, total 49,974 tons; Main Reef Leader—Payable 2,392,227 tons, unpayable 167,045 tons, total 2,559,322 tons; South Reef—Payable 1,971,419 tons, unpayable 131,638 tons, total 2,103,057 tons. Totals—Payable 4,407,515 tons, unpayable 304,838 tons,—4,712,353. Ore reserves—The payable ore reserves at 31st December, 1911, were estimated as follows:—Main Reef Leader, 5,165,061 tons, value 8.0 dwts; South Reef, 4,959,011 tons, value 6.5 dwts. Total and average, 10,124,072 tons, 7.25 dwts value. The above tonnage includes 427,171 tons valued at 8.4 dwts., representing large pillars left to ensure the safety of shafts and other important workings. This tonnage cannot be mined until the pillars can be taken out without endangering the safety of the underground workings. Compared with the estimates at the end of the previous year, the tonnage is greater by 3,841,353 tons, whilst the grade has decreased by .35 dwt. This falling off in grade was only to be expected, as with the increased development of the Western and Southern areas, the value of the ore reserves is gradually becoming more indicative of the average grade throughout the entire property. In addition to the above tonnage there are developed 1,161,307 tons of an average value of 3.2 dwts. There is also a small quantity of reclaimable ore in the Crown Reef Section, consisting of pillars, footwalls, etc., but owing to the extreme difficulty of estimating the tonnage, it has not been included in the reserves. The increase in the percentage of waste sorted out is due to the starting, in August last, of the new crusher and sorting at No. 7 shaft. About 16 per cent. of sorting is being done at this station, and during the latter months of the year the sorting throughout the whole propery averaged 14 per cent. When the second new station, at No. 5 Shaft, is in operation, a further increase in the average sorting rate is expected. Compared with the previous year's figures the total working costs have increased by 1s. 2d. per ton milled, which has been largely due to the greater percentage of sorting accomplished, an increase in the rate charged for developing, and an advance in cost of sand filling. Capital Account.—The expenditure was as follows:—Development—No. 5 Shaft Sinking, etc., £36,171 4s. 3d., No. 3 Shaft pump chamber and sump £238 3s. 10d.—£36,409 8s. 1d. Equipment—Sundry extensions to machinery and plant and buildings, etc., including equipment at No. 5 Shaft £497,838 4s. 3d. less plant, etc., sold £682 11s. 3d.—£497,155 13s.: £533,565 1s. 1d. Mine development suspense account: Expended during the year £244,873 9s. 10d., less redeemed through working costs £92,544 3s. 4d—£152,329 6s. 6d. Main haulage level—In the main haulage drive on the 13th level, which is 15 feet wide by 9 feet high, the footage accomplished during the year was 6,683 feet, bringing the total length of this drive at the end of the year to 8,751 feet. The actual driving work is practically complete from No. 1 Shaft to a point 579 feet West of No. 7 Shaft, thus connecting the underground workings of all sections of the mine. Suitable equipment for the transport of ore in large quantities is now being installed. Development—Development has been pushed ahead rapidly during the year, resulting in the large footage of 71,023 feet. There is still a considerable amount of work to be done in completion of the advance development programme, not so much for the purpose of further increasing the reserves as to facilitate the economical handling and transport of ore. Construction work—Owing largely to delays experienced in deliveries of material, the progress anticipated early last year in new construction work has not been fully realised. The main works completed, or practically completed, throughout the year were as follows:—1 New headgear and double stage winding at

No. 7 Shaft. 2. new crusher station at No. 7 Shaft, 3. new 160-stamp mill and subsidiary plants, 4. ventilating fan, 5. sands filling equipment, 6. 40 new cottages for Boer miners, 7. native married quarters, native change houses and additions to native central hospital. The double stage winding equipment at No. 7 Shaft, which was completed about the middle of the year, is working very smoothly, as is also the new crusher station at that shaft. The entire tonnage of ore from the Western Section is now being hoisted on day shift only, which has very much simplified hoisting arrangements, as well as underground and surface transport. The chief items of construction work yet to be completed are the new crusher station, permanent winding arrangements, shaft equipment and underground pumping plant, all at No. 5 Shaft, the general surface railway system for ore transport, and the extension to Butters' Plant. The construction programme should be finished soon after the middle of this year. Sands filling—All of the sands filling plants are now in operation. The worked out areas in close proximity to No. 2 Shaft have been filled, and rapid progress is now being made in the neighbourhood of No. 7 Shaft. At No. 1 Shaft the work has been slower, owing to most of the areas around that shaft having already caved, and also to constant interruptions in the supply of sand, which, for this part of the property, is few through the Robinson Gold Mining Company's workings. Electric Power—As the Rand Mines Power Supply Company, Limited, is not yet in a position to furnish the full requirements of the Company, the entire electrification of the plant has been seriously delayed, and the Company is still obliged to make use of most of its steam plant in conjunction with whatever electric power and compressed air is available. Naturally this has resulted in exceptionally high cost of power, and until the entire plant is electrified very little improvement in power cost can be looked for. Native Labour—Operations continue to be seriously handicapped by an inadequate supply of native labour. Although there has been some improvement on the previous year's numbers, the supply is still very far short of what is required to keep the full plant going, notwithstanding the assistance which has been obtained by the extensive use of small machines in stoping. Underground White Employees—In my last annual report I referred to an experiment for augmenting the supply of white miners by teaching a number of young South Africans. So far this has been moderately successful, and although all of the cottages erected have not yet been filled, the experiment is undoubtedly making progress, as this class of miner is increasing gradually in numbers and efficiency.

O.F.S. Diamonds.

It is rumoured, says the "Bloemfontein Post," that good indications of diamonds have been discovered not far from Bultfontein, and we understand that a few of the local men will shortly start prospecting on the farm.

New Thor Diamonds.

All work was suspended on the property of the New Thor Diamond Mining Company in November, shortly after the death of the Chairman, Mr. Harry Lazarus. Since then boring for water on the property has been in progress, and it is stated that the other directors intend, if this is successful, to make financial arrangements for resuming work. A second pan is also erected, and with this working it is hoped the profit-earning stage will be reached.

Goedgenoeg and Bloemhof.

The Goedgenoeg diamond finds for February have been returned as 57¾ carats, valued at £710. There were nineteen separate returns, the highest being the 27½ carat stone, valued at £450, previously reported. At Bloemhof a few days ago the largest diamond yet found on a Transvaal alluvial digging was recovered—this being a stone of 125 carats. Though not a perfect gem its value is nevertheless placed at £1,000. Some good finds have recently been made at London, including diamonds of 16, 11, 9 and 7 carats, and many smaller ones; while a nice 25 carat stone was found a few days since at Mooifontein, for which the owner has been offered £450, but wants £500. Modderkraal also joins in the chorus of good finds, including stones of 18¼ and 16½ carats.

Royalty and "DE RESZKE" CIGARETTES.

DE RESZKE Cigarettes have fought many battles on quality. They win because their quality is the highest and is constant. Their latest success is an order from His Royal Highness the Duke of Connaught, the new Governor-General of Canada. They were selected after critical comparison with samples from all leading manufacturers. Although not the first time 'De Reszke' Cigarettes have been honoured with Royal patronage, we take particular pride on this occasion, because His Royal Highness the Duke of Connaught is well known to be a connoisseur of fine discrimination.

DE RESZKE Cigarettes can be obtained **everywhere** throughout South Africa, from all Tobacconists, Hotels, etc.

SCHADTLER, Limited, P.O. Box 3284, Johannesburg.

DURBAN ROODEPOORT DEEP RESULTS.

Slightly Lower Profits—Costs Reduced Despite Shaft, Labour, and Water Troubles—Important Centralization Scheme.

The following is a comparative return of working expenditure, revenue, working profit and net profit for the last two years:—

	Ore Milled.	Yield per Ton Milled.	Working Expenditure.	Working Revenue.	Working Profit.		Net Profit.	Dividends Paid.	
	Tons.	Fine Dwts.	Average Cost per Ton of Ore Milled.	Average Value per Ton of Ore Milled.	Profit.	Profit per Ton of Ore Milled.	Total.	Rate per cent.	Amount.
			£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		£
1910	240,530	7.093	1 4 6.756	1 9 8.341	61,721 6 3	0 5 1.585	61,029 15 1	7½	33,000
1911	262,540	6.926	1 4 4.339	1 8 11.951	60,834 14 6	0 4 7.612	58,959 8 8	5	22,000

The net profit for the year amounted to £58,959 8s. 8d., which has been dealt with as follows:—Appropriated on account of capital expenditure, £31,437 12s. 8d.; Government tax on profits, £5,521 16s.; dividends No. 5 of five per cent., £22,000. The capital expenditure for the year, as detailed in the manager's report, amounted to £36,247 10s., of which £31,437 12s. 8d. were appropriated from profits. The liability of the company at the close of the year amounted to £15,532 1s. 4d., made up of:—Liability brought forward from last year, £11,636 19s. 9d.; difference between amount spent on capital account during the year and amount available for appropriation, £4,809 17s. 4d.; total, £16,446 17s. 1d.; *less* value of reserve gold, £914 15s. 9d.

CONSULTING ENGINEER'S REPORT.

The Consulting Engineer, Mr. Percy Cazalet, writes:—The operations of your Company have been considerably hampered during the year under review by both shaft and water troubles, which affected the output and development operations for several months, thereby greatly reducting profits during that period. Towards the early part of the year serious crush became evident in No. 2 vertical shaft. This not only interfered with the hoisting of ore, but also, by bringing pressure to bear on the pump columns, made them faulty and necessitated long stoppages of the pumping plant while the columns were repaired. With a mine handling the quantity of water which the Durban Deep handles, these stoppages of the pumping plant meant the flooding of the lower levels of the mine, and at one time both Nos. 2 and 3 shaft bottoms and the two lower levels were lost, together with the lowest electric pumping station on the 10th level at No. 3 shaft, while the other pumping station on the 9th level at No. 2 shaft was also at one time seriously threatened. It was decided in June to shut down No. 2 shaft while the weak part of the shaft was completely retimbered and dressed down and the pump columns relieved of side pressure and put in order. This work was successfully accomplished by the beginning of September, and the shafts were again completely unwatered by October, since when no further trouble has been experienced with either the shaft itself or the rising mains. Since No. 2 shaft has been put in order No. 3 vertical shaft has also shown signs of weakness in the neighbourhood of the bend where the reefs cross through the shaft, and the repair of this part of the shaft is now in hand. It has so far been possible to carry out the repair work without interfering seriously with hoisting operations, and it is hoped that it may be possible to complete the work in this manner in a few months. No. 3 incline shaft between the 6th and 8th levels has also given very considerable anxiety owing to serious crush, and this section has been completely retimbered during the year and is at the moment giving little trouble. Opportunity was taken of these enforced stoppages to relay large sections of the incline shafts with new heavy section rails and generally to carry out such repairs as were advisable, and the cost of this work and of the above-mentioned shaft and column repairs has been met entirely out of working costs during the year under review. In spite of the foregoing difficulties it has proved possible to accomplish 14,938 feet of development, an increase of 3,296 over the previous year, and this footage has allowed of substantially increasing the ore reserves and of bringing the mine towards a much better position as regards stope faces available than for some time past. This increase of development footage has only proved possible owing to the installation of the two electrically driven compressors which were part of the scheme of electrification of the main plant centred round No. 2 shaft. It is estimated that, if the present rate of development can be maintained, by the middle of the current year enough fresh stoping faces will have been rendered available, especially on the Main Reef, to make the mine much more independent of fluctuations in the labour supply, since Main Reef can be broken by machines, while the South Reef, with its treacherous hanging wall, is quite unsuited to any tpye of machine drill yet experimented with. It is gratifying to note that the South Reef has continued to maintain its consistent payability, whilst large blocks of payable Main Reef, although of lower value than South Reef, have also been opened up. The ore reserves have been re-estimated as at December 31st, 1911, to be as follows:—Main Reef, 575,156 tons, value 5.8 dwts., width 57 inches; South Reef, 712,915 tons, value 7.5 dwts., width 42 inches; total, 1,288,071 tons, value 6.8 dwts., width 48 inches. The above payable reserves may be segregated thus:—(a) Ore in blocks available for stoping, 777,697 tons, value 6.5 dwts.; (b) ore exposed by driving and which will be rendered available during current development operations, 187,953 tons, value 7.1 dwts.; total 965,650 tons, value 6.6 dwts.; (c) shaft and boundary pillars, 322,421 tons, value 7.2 dwts.; grand total, 1,288,071 tons, value 6.8 dwts. The above total ore reserves compared with last year show an increase of 226,094 tons and are of the same value. In addition to these reserves there are, it is estimated, some 457,932 tons of low-grade ore of a value of 3.7 dwts. standing developed in the mine, which represent the accumulation of unpayable ore since the commencement of operations. Referring to the 187,953 tons of ore contained in the above reserves and which are shown separately from the ore immediately available, it must be noted that this ore has all been exposed by driving and has been valued, but that owing to the winze connections not yet being entirely completed, the ore contained therein is not presently available for the mill, and they have therefore been shown separately. In practically all cases the work of complete exposure will be accomplished during the course of the current development work this year, and in some cases within a few months. It will be noticed that the amount of ore contained under the heading of shaft and boundary pillars, viz., 322,421 tons valued at 7.2 dwts., shows an increase of 127,995 tons over last year's figures; this has come about partly by the extension of No. 1 shaft but mostly owing to the decision to increase the areas which will not be stoped on either side of the shafts to ensure their safety from crush. You will see from your manager's report that the costs for the year at 24s. 4d. show a decrease of 3d. per ton when compared with the previous year and this in spite of the large amount of heavy repair work accomplished and the loss of crushing meanwhile. But for the bad results during the months of May to August when the effect of the shaft and water troubles already mentioned made themselves so seriously felt, the year's operations would have shown a very material improvement. A scheme for the centralisation of all ore hoisting at and gravitation of water along the plane of the 12th level to No. 1 shaft, which is a five-compartment modern shaft in good condition, has been adopted and will be proceeded with vigorously during the current year. The effect of the above-mentioned scheme of centralisation will be the possibility of the closing down and abandoning of No. 3 shaft within a very few years; the confining of No. 2 shaft largely to the handling of men and tools only, and the centralising of all ore possible in the No. 2 and 3 shaft sections of the mine along the plane of the 12th level by means of mechanical or animal traction to No. 1 shaft. Opportunity will also be taken of this main level for the concentration of all water in the mine to the bottom of No. 1 shaft, where it will be dealt with at one pumping station and thrown direct to surface in a single lift by centrifugal pumps. The installation of this pumping plant will allow of abandoning the four present pumping stations with their costly maintenance and attendance and should pay for itself in the saving in pumping charges in under two years, besides giving more security against flooding of the lower levels. At no time during the year has your mine had sufficient native labour to admit of the plant running at its full capacity and this in a mine where such a large proportion of the stoping has to be accomplished by hand, is a very serious handicap and cannot but be reflected in the tonnage and profit results obtained. The electrification of your main plant centred round No. 2 shaft was gradually introduced during the latter part of the year and was finally completed towards the end of December, since when all the plant has been running quite smoothly.

MANAGER'S REPORT.

The Manager, Mr. A. P. Rouillard writes:—Unusual difficulties have been experienced underground during the year under review. Towards the end of May the lower portion of No. 2 shaft, at its intersection with the South Reef, crushed in. Hauling had to be stopped, and over 100 feet of this portion of the shaft retimbered. This ground is now under control, and should not give us any more trouble. The pump columns were also damaged by this movement of the ground in No. 2 shaft, and the lower workings at both No. 2 and 3 shafts were flooded temporarily. No. 3 shaft incline had to be retimbered between the 6th and 8th levels, a distance of 380 feet, and the retimbering of the vertical portion of this shaft, where it intersects the reef, is now in progress. Working costs for the year under review show a decrease of 3d. per ton milled. Stoping costs were only 3s. 6d. per ton, as compared with 4s. 7d. for 1910, but "other mining costs," which included repairs mentioned, show an increase of £20,774 on the preceding year. The abnormally high working costs during the months of May, June and July are only partly due to the direct expenditure on repairs to shafts and pumping plant, as the reorganisation of all underground work rendered necessary by the closing down of No. 2 shaft and the flooding of the two lower levels in the western section of the mine, adversely affected the underground efficiency, and resulted in a great reduction in the tonnage milled. The total tonnage mined for the year amounted to 327,171, an increase of about 18,000 tons over 1910, while the tonnage milled showed an increase of 22,000, and the total working profit, declared at £60,835, was within £900 of the profit earned in 1910. Several factors have contributed to the decrease in the percentage of waste rock sorted on the surface, viz. : (1) Increased sorting of waste in stopes underground wherever possible for the support of the hanging wall; (2) increased percentage of Main Reef mined from 25 per cent. to 34 per cent; (3) larger proportion of development rock sent to the mill. Development work has been pushed ahead as much as possible. Special attention is being paid to the opening up of the Main Reef, which, though erratic in value, is on account of the nature if its hanging wall and width specially adaptable to machine stoping. The number of natives available for underground work during the year has still been considerably below our requirements.

ELECTRIFICATION OF THE RANDFONTEIN CENTRAL.

The Simplicity of the Ward Leonard Type of Motor—The Dependence of Cost on Locality—American Engineers and Rand Practice.

At the last meeting of the South African Institution of Engineers, Mr. T. P. E. Butt replied at length to the various criticisms made with reference to his valuable and interesting paper, read some months ago, on "The Electrification of the Randfontein Central." The reply dealt mainly with the comparisons made between the Ward Leonard and induction types of motor for hoisting, to the disadvantage of the former, which is, it will be remembered, the type in favour at Randfontein, and in disfavour in the engineering department of the Corner House. The arguments used in support of the Randfontein view are too long to be quoted here, but the following statement of Mr. Butt, *inter alia*, sums up the main reasons for his preference:— "The comparisons I effected in my papers were on the basis of simplicity of operation, and I do not think there can be any doubt as to which is the simpler of the two. I could hardly infer that the induction motor hoists are unsafe without incriminating myself, since we have a few on this group of mines which have been purchased on my recommendation, but I have carefully avoided installing them unless the conditions were so disadvantageous to the Ward Leonard type as to compensate for the greater skill required in operation." It is interesting to learn, by the way, that "had the power station been situated in the East Rand district, the power costs of 0·247 pence per unit, as given for March last (1911), would have been reduced to 0·186."

American Engineers are Surprised.

It is worthy of mention that Mr. J. W. Kirkland, in seconding the motion, said he had recently been in America, and he was reminded by that night's discussion of one or two sessions he had at the works of the General Electric Company, where, at the round table, the engineers collected together to discuss electrical problems in connection with mining. He had with him a copy of the journals of the institution, amongst them being a copy containing Mr. Butt's most valuable paper. He recalled distinctly the feeling of surprise and wonder on the part of the engineers that any mining corporation in the world should operate on such a large scale as to require a plant of from 12,000 to 20,000 k.w. The excellent photographs which accompanied the original paper were also eye-openers to engineers on the other side of the Atlantic. The conditions under which mining for precious metals was carried on in America were very different from those which they had on the Rand. A few hundred k.w. would be all that were required for any of the precious metal mines that they had to deal with. It was, of course, different as regards base metal mines, but the progress that was evidenced by Mr. Butt's paper had not yet struck that side of the world. American engineers were very much interested in what Mr. Butt had said. and in the success which had been achieved with the three-phase system of hoisting, and this was the cause of considerable gratification to them, as he understood it had been in England and on the Continent. Some of the results which had been achieved here with three-phase hoisting had been the cause of some surprise.

Vryburg Diamond Diggings.

The "Northern News" understands that a fresh spurt has been given to the diamond digging at Rietfontein (Muhura Mutla), by the discovery of a fresh strike of gravel. Mr. Alex Wilmore has, however, stuck to the old spot and has got on to very good gravel at thirty-seven feet, which he thinks will pan out well.

Worcester G.M.

At the annual meeting of the Worcester Gold Mining Co., last week, the chairman (Mr. F. Lindenberg) spoke at some length upon the steady progress which was being made on the Barberton property, the new power scheme now being carried out. An adjoining water right, known as the Cataract, had recently been acquired, which, together with the electrical plant, would cost £15,000. This was being raised by loan, to be repaid by economies during the next three years, dividends to take precedence to the extent of 20 per cent. This supplementary power would make the company independent as regards water in the dry season. The policy of the directors was endorsed, and the retiring directors, Messrs. Hall and H. C. Meiring, were re-elected. Mr. Rhodes, on behalf of the Capetown shareholders, asked that an explanatory footnote be appended to monthly statements whenever these bore an unfavourable aspect, as was the case in December last, when an explanation would have prevented something like a panic among speculators.

Tin Discoveries in Damaraland.

Reuter's correspondent at Windhuk, German West Africa, says that alluvial tin ore blocks are reported to have been discovered near the farm Otjimboyo by Mr. Hamilton, chief engineer of the Otavi Exploration Company. The news has created some curiosity as the fields were long ago given up as unpayable.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted for the consideration of the Editor that is not accepted by him will be returned if a stamped and directed envelope is enclosed for the purpose.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' Examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings, Box 2061, Johannesburg.

BANTJES CONSOLIDATED MINES IN 1911.

Results Affected by Shortage, Poor Quality, and Irregularity of Labour Supply—Far-Seeing Development Policy.

The following is a table of results at the Bantjes since the commencement of milling operations:—

	Tons Mined, exclusive of Ore from Dumps.	Tons sorted out. Total.	%	Average Number of Stamps. Working.	Tons Milled.	Working Revenue. Total. £ s. d.	Working Revenue. Per Ton Milled. s. d.	Working Expenditure. Total. £ s. d.	Working Expenditure. Per Ton Milled. s. d.	Working Profit. Total. £ s. d.	Working Profit. Per Ton Milled. s. d.
1910	104,148	18,465	15.9	60	97,205	123,462 11 3	25 4.8	110,931 18 8	22 9.9	12,530 12 7	2 6.9
1911	278,540	54,281	16.6	60	273,212	372,955 16 8	27 3.6	319,019 18 6	23 4.3	53,935 18 2	3 11.3
Ttls. & avges.	382,688	72,746	16.4	—	370,417	496,418 7 11	26 9.6	429,951 17 2	23 2.6	66,466 10 9	3 7.0

The accounts show that a net profit was earned during the year of £54,072 11s. 9d., which, with the profit of the previous year of £11,325 6s. 1d., and £3,651 11s. 1d. unexpended working capital brought forward, makes a total of £69,049 8s. 11d. This sum has been dealt with as follows:—Expenditure on capital account, as per manager's report, £34,733 6s. 3d.; less proceeds of stands sold, £1,110 18s. 5d.; Government tax on profits, £6,800 10s.; balance carried forward to balance sheet, £28,626 11s. 1d. The cash and cash assets over and above liabilities amount to £31,394 15s. 4d., including reserve gold £2,768 4s. 3d.

Consulting Engineer's Report.

The Consulting Engineer, Mr. Percy Cazalet, writes as follows:—The development accomplished for the year was 14,410 feet. The bulk of the footage on reef was confined to the South Reef, which is still the mainstay of the mine, but latterly some driving has been done on Leader at the central shaft. Shaft sinking has been pushed throughout the year, and the total accomplished was 1,226 feet. To the west of the central shaft in the lower levels an area on South Reef of lower values was expected from indications on the 6th and 7th levels, and this has been borne out in practice, though more satisfactory values have lately been met with on the 8th level west just prior to entering a dyke in which the face of the drive still is. To the east of the shaft an area of more broken ground has been proved, but where the South Reef has been exposed the values are generally good and in places excellent. Some Leader has been exposed on the 10th and 11th levels just east of this shaft, which has given quite hopeful values; this fact is especially satisfactory since previously no Leader af consequence had been exposed in this section of the mine. The 6th level west drive from the central shaft is being driven straight and extra wide as a main tramming and concentrating level, and, as stated in your Manager's report, it has now only about a further 1,000 feet to go to reach the west shaft, and so bring into commission all ore in this section. In driving this level, it has been necessary to advance without reference to the rather serious faulting in this area, and the drive in question has not therefore contributed any ore to the developed reserves, although its advance will render several large blocks of South Reef readily available at small further cost. A similar drive is just commencing on the 10th level west of the central shaft. During the five months of the year working costs were debited with 5s. per ton for development redemption, and thereafter with 4s. 6d., and in addition to the satisfactory development footage accomplished, an amount of £6,455 9s. 3d. has thus been credited to development suspense, and will be available when the labour position admits of it for increasing development. Had labour been available to allow of this sum being utilised on development during the year, it is estimated that the payable ore reserves would have shown a reasonable excess of tonnage over last year's figure. It must be noted, as stated by your Manager in his report, that development has, in the area surrounding the central shaft, been confined very largely to preparatory work such as station cutting, shaft sinking, cross-cutting, etc., and that, therefore, your mine is in a sound position to increase its ore reserves economically and speedily at short notice. The ore reserves have been re-calculated as at December 31, 1911, to be as follows:—Main Reef, 25,136 tons, value 6.1 dwts., stoping width 47 inches; Main Reef Leader, 10,947 tons, value 6.5 dwts., stoping width 39 inches; Leader, 67,791 tons, value 8.4 dwts., stoping width, 38 inches; South Reef, 792,213 tons, value 7.3 dwts., stoping width 41 inches; total and average, 896,087 tons, value 7.3 dwts., stoping width 41 inches. The above payable reserves may be segregated as under: (a) Ore in blocks available for stoping, 599,131 tons at 7.4 dwts.; (b) Ore exposed by driving and which will be rendered available during current development operations, 173.070 tons at 6.9 dwts.; total, 772,201 tons at 7.3 dwts; (c) Safety, shaft and boundary pillars, 123,886 tons at 7.6 dwts.; grand total, 896.087 tons at 7.3 dwts. The above ore reserves, compared with last year, show a decrease of 62,353 tons of .3 dwt lower value. In adition to these reserves there are, it is estimated, some 759,025 tons of low-grade ore assaying 3.4 dwts. standing developed in the mine, which represent the accumulations of unpayable ore since the commencement of operations. In last year's report it was stated that the ore reserves as then published should be discounted by from 5 to 10 per cent. to bring them to a recovery basis, insufficient work having then been done to allow of a definite figure being arrived at. Experience of stoping the South Reef now shows that a discount of 5 per cent. is all that need be applied to the sampling records of this mine, and this amount of discount has therefore been applied to the South Reef before arriving at the ore reserve figures; when sufficient experience of the other reefs in actual stoping has been had they will be dealt with similarly; the total of the exposures on the reefs other than South Reef being so small the general value of the reserves will not be affected thereby. Referring to the 173,070 tons of ore contained in the above reserves which are shown separately from the ore immediately available, it must be noted that this ore has all been exposed by driving, and has been valued, but owing to the winze conections not yet being entirely completed or due to the situation of the blocks of ground in question, the ore contained therein is not immediately available for the mill and they have therefore been shown separately. In practically all cases the work of complete exposure will be accomplished during the course of current development work this year, and in some cases within the next few months. It will be noticed that the amount of ore tied up in safety, shaft and boundary pillars shows an increase of 36,778 tons over last year; this has come about partly by the extension of the shafts themselves, but mostly owing to the decision to increase the areas which will not be stoped on either side of the central shaft to ensure its safety from crush under all circumstances. The average working costs for the year, at 23s. 4d., show an increase of 6d. per ton over the few months' crushing in 1910, when a very high proportion of surface dump stuff was milled; however, it must be borne in mind that latterly, since no dump stuff has been sent to the mill, the costs have been higher than this average figure, but so also has the grade, making the profit per ton recovered for the last four months of the year 5s. as compared with an average of 3s. 8d. for the preceding eight months. That the operations of your Company for the year have not been as satisfactory in regard to profits as might have been anticipated is due largely to the shortage, poor quality and irregularity of the native labour supply. During the first eight months of the year an average of 6,000 tons had to be drawn from the surface dumps owing to this cause, and the average monthly profit during this period was only £4,105, but for the last four months, owing to the ore milled coming entirely from the mine, the average profit declared was £5,275 and the gold reserve increased by 660 ounces. Should the supply of labour become more normal and with the increasing use of small machine drills, it is hoped that the profits for the current year will show a further increase. The Butters' slimes plant, referred to last year, was completed and put to work during July, and has been giving most satisfactory results, the average slimes residues for the last five months of the year giving the low figure of .12 dwt. The actual extraction laterly has also improved considerably and is now much better than the year's average would indicate.

Acting Manager's Report.

The Acting Manager, Mr. W. W. Lawrie, writes as follows:—Development footage for the year averaged 1,200 feet per month. It was found necessary in the latter half of the year to confine machine development to the central shaft. The eastern shaft was sunk 343 feet, and after having reached 100 feet below the 10th level, sinking was discontinued owing both to the necessity of husbanding the labour force and to admit of pushing on with the unproductive development work necessary in the neighbourhood of the central shaft. The eastern shaft is now down four levels below the lowest stoping in this area. The central shaft was sunk 858 feet during the year. Stations have been cut on all levels to and including the 12th, and a start with driving on the 9th, 10th, 11th and 12th levels; this shaft is now down six levels below the lowest stoping in this area. As most of the cross-cutting and other dead work on the lower levels of the central shaft has been completed, the position as regards development is very satisfactory and better than the ore reserves would indicate. The west incline, which was being continued as a winze, was advanced 25 feet and having reached the plane of the 6th level was stopped pending the approach of the 3rd and 6th levels west from the central shaft; these drives were, at December 31st last, a distance of approximately 300 feet, and 1,000 feet respectively from the shaft, and as soon as the connections are made to allow of ore being handled through them to the central shaft, the stope faces now lying idle in this area can be exploited when required for supplying ore to the mill. Practically no work has been done in this section of the mine during the year, pending the completion of the levels in question. Good values in the Leader have recently been struck on the 10th and 11th levels, central shaft; further development is now being done with a view to systematically testing the Leader in this section of the mine. The alterations to the slimes plant were completed during the year. The Butters' filter press was started up in July, since when excellent results have been obtained. Owing to the shortage of native labour the plant has not been run to its fully capacity. Ore from the development dumps was milled until August, since when the labour position, having improved somewhat, all ore milled has been drawn from the mine, with the result that the grade of ore sent to the mill has improved by .5 dwt. for the last four months of the year. In conculsion, I have much pleasure in placing on record my appreciation of the good work done by the mine staff.

THE YEAR WITH THE GELDENHUIS DEEP.

Decreased Profits and Tonnage Milled—Labour Shortage—Less Satisfactory Development Values—Geldenhuis Estate Mill Closed Down—Extensive Sandfilling and Underground Water System Adopted.

In 1911 the Geldenhuis Deep earned a net profit of £232,611 0s. 7d., and the addition of £114,411 12s. 9d. brought forward from last year's balance sheet, makes a total of £347,022 13s. 4d., which has been appropriated as follows:—Capital expenditure: On property, £3,522 13s. 6d.; on equipment, £93,027 2s. 3d.; Government tax on profits, £18,121; dividends Nos. 23-24, £175,725 18s.; balance of appropriation account carried forward, £56,625 19s. 7d. In addition to the balance of appropriation account, which is represented by the cash and cash assets, less liabilities, there is a gold reserve of £6,627 15s. 5d. Item £24,455 13s. 6d. under the head of property in the balance sheet is explained as follows:—Payment to Jumpers G.M. Co., Ltd., in connection with the acquisition of certain undermining rights under that company's water-right, £1,544 13s. 6d.; expropriation of property required for extension of sand dump, £75; sum total of annuities payable to the Government for mining property acquired, £22,836. Against this the Union Government figures as a creditor for £20,933, after payment of the first annuity of £1,903. The directors' report states that the board decided some time ago that the development footage accomplished during the early part of last year should be increased, and that any excess development resulting be debited to development capital account. The payable tonnage developed during the year has exceeded that mined from ore reserves by 40,782 tons. However, a revision of the total payable reserves as per 31st December, 1911, shows a decrease of 258,641 tons as compared with the figure at the end of the previous year, chiefly owing to the pay limit having been slightly raised. As the excess development effected during the year cannot, under the circumstances, remain as a debit on capital account, the sum of £8,359 4s. 4d. has been transferred to working expenditure and revenue account. Since the close of the year it has been decided to concentrate reduction operations on the east and west mills; and the north reduction plant which, owing to its age, has given the least satisfactory results in regard to extraction and costs, has therefore been closed down. At the close of 1910, it was anticipated that the Rand Mines Power Supply Company, Limited, would be able to supply the company's full requirements of electricity and compressed air by about May last. The supply of power commenced in March last, but, for various reasons, the Power Company has not as yet been able to meet the full requirements of your company. The deficiency has been obtained by the running of part of the company's steam plant. Arrangements are being made by the Power Company to increase its plant, and it is expected that a full supply of power will be available about the end of 1912.

Consulting Engineer's Report.

Mr. B. Madew, the Consulting Engineer, writes:—The main features of the Company for the year ending 31st December, 1911, as compared with the previous year, as as follows:—Tons milled: Year ending 31st December, 1910, 826,610 tons; year ending 31st December, 1911, 801,860 tons. Yield per ton milled: Year ending 31st December, 1910, 28s.; year ending 31st December, 1911, 27s. 9d. Working costs per ton milled: Year ending 31st December, 1910, 21s. 11d.; year ending 31st December, 1911, 22s. 1d. Working profit per ton milled: Year ending 31st December, 1910, 6s. 1d.; year ending 31st December, 1911, 5s. 8d. Working profit declared, including profit from accumulations: Year ending 31st December, 1910, £260,524; year ending 31st December, 1911, £236,125. Reserve gold: Year ending 31st December, 1910, 4,675 ozs.; year ending 31st December, 1911, 1,580 ozs. Payable reserve at end of year: Year ending 31st December, 1910, 2,521,481 tons at 6.1 dwts per ton; year ending 31st December, 1911, 2,262,840 tons at 6.2 dwts. per ton. The tonnage milled shows a decrease, the profit is lower and generally the results are not quite as satisfactory as those of the previous year. The supply of natives was not up to requirements, which, coupled with the fact that it was considered advisable to maintain the development at a high rate, even to the extent of taking labour off stoping, accounts for the reduction in tonnage milled. The total working costs were increased by 2d. per ton milled, due to a decrease of 24,750 tons crushed and to the inclusion of abnormal expenditure debited to working costs of £12,793 for sand-filling and reconstruction of the west mill, accounting for roughly 4d. per ton milled. Without this additional expenditure the costs would have shown a reduction of about 2d. per ton. On account of the low payability of the reef disclosures, it was decided, about the middle of the year, to push ahead the development energetically. This policy was imperative and was rigidly adhered to, with the result that whereas the average footage for the first five months was under 1,700 feet per month, that for the remainder of the year was 3,112 feet, the total footage for the year being 30,273 feet. The total ore exposed by the development operations for the year was 1,448,614 tons, of which 652,663 tons, or 45 per cent., were payable of 6.7 dwts value. The values disclosed in the bottom levels of the east and west sections are not quite up to expectations; there is, however, reason to believe that the values may improve towards the southern boundary, especially in the eastern section. The payable ore reserves at December 31st, 1911, were estimated as follows:—Main Reef, 842,392 tons, value 5.6 dwts; Main Reef Leader, 762,769 tons, value 6.7 dwts.; South Reef, 657,679 tons, value 6.4 dwts.; total, 2,262,840 tons, value 6.2 dwts. The above ore reserves may be classified as follows: 1. Ore fully blocked out for stoping, 1,191,551 tons, value 6.1 dwts.; 2. ore valued, which will be rendered available for stoping by current development and sand filling, 739,174 tons, value 6.3 dwts.; 3. ore contained in shaft and boundary pillars and therefore unavailable for stoping at present, 332,115 tons, value 6.5 dwts.; total, 2,262,840 tons, value 6.2 dwts. Compared with the position at the end of the last financial year, there is a drop in the tonnage of 258,641 tons, while the grade shows a slight increase of .1 dwt. per ton. The Main Reef tonnage is about 160,000 tons and the Main Reef Leader 100,000 tons less, as compared with the previous year, whereas the South Reef tonnage indicates a small increase. The tonnage included in the above reserves from the north section is small, amounting to a little over 100,000 tons. In addition to the above payable reserves, there is an accumulation of 3,693,175 tons of unpayable ore averaging 2.9 dwts. per ton. A considerable quantity of this is, however, on the margin of payability and can be profitably mined under improved working conditions. The stoping widths of the tonnage average 57 inches for the Main Reef, 41 inches for the Main Reef Leader, and 48 inches for the South Reef. The north section will continue to supply ore for some time to come, but in diminishing quantity and the question of closing down the north battery, which has been costly to operate, has been under discussion for some time. This has now been done, namely, on the 23rd January, 1912, and all ore from the three sections of the mine will be crushed at the west and east mills, which have a capacity of 27,500 and 32,000 tons respectively, making the total present capacity of the plant 60,000 tons. Improved extraction and economy of working are expected to result from this concentration. Towards the end of the year additions were made to the west mill, the cost of which was charged out of working costs. The machinery and plant were well maintained throughout the year, and continue in fair running condition. A considerable sum of money was spent in improving the underground water system for the purpose of allaying the dust, with encouraging results. Sand-filling operations were successfuly carried out during the year, and materially facilitated the extraction of ore from the northern section. The Government Mining Engineer has directed that further support be given to the South African railway line passing over the east section, by means of rock-packs or sand-filling. This work is being carried out and will entail some expenditure and occupy the services of natives who would otherwise be employed on more productive work; valuable ore, however, will be reclaimed from these operations, which will, to a certain extent, offset the cost incurred.

Manager's Report.

The Manager, Mr. H. M. Thomas, writes, *inter alia* :—North Section (Geldenhuis Estate).—Much benefit has been derived from the sand-filling operations, and 25 per cent. of the total rock mined at this section is being obtained at the present time as the result of its installation. The ore reserves in other parts of this section are becoming depleted. Mining has been hampered to a considerable degree by continued caving, but much of the caved ground is being exploited with satisfactory results, and reclaiming work will be further extended during the present year. The value of the ore has maintained a satisfactory standard and this mine has proved a valuable acquisition to the amalgamated company. East Section (Geldenhuis Deep).—No. 1 shaft has been permanently stopped at the 15th level, which should cause a considerable reduction in the future development costs. No. 2 shaft was sunk a further 360 feet and is 293 feet from its southern boundary. The stage hoist will be running in March and will obviate many obstacles at present obtaining in so far as stoping and development operations on the lower levels are concerned. Its installation will enable No. 2 shaft to handle all the rock mined at this section, when conditions warrant the permanent closing down of No. 1 shaft, which will introduce economies in rock hoisting. Advantage has been taken of the sand-filling plant to fill near No. 2 shaft as a further means of support for the vertical. The pumping plant in No. 2 shaft has been completed and is pumping all water from the north and east sections and such water as is made below the 7th level of the west section (Jumpers Deep). An increased quantity of ore of good value has been extracted from the caved area. West Section (Jumpers Deep).—No. 3 shaft was sunk 92 feet, but No. 4 shaft was not further deepened. Since both these shafts are well ahead of stoping operations, the policy has been followed, during the past year, of extending the drives and connecting them by winzes to increase the number of points of attack for mining rock. Stoping operations have been hampered somewhat by the large footage which had to be accomplished in order to carry out the development programme. General.—The residue values were decreased by 2.4d. per ton and the extraction was 95.9 per cent. The development operations resulted in an increase of 4,444 feet at the reduced cost of 6s. 5d. per foot, which was partly due to less incline footage. In other directions also every effort is being made to produce the maximum tonnage with the coloured force at the disposal of the Company. Such devices as using ponies for tramming rock and mechanical appliances for transport of rock in stopes have been introduced wherever practicable. At the east section all the air and electric power is being supplied by the Rand Mines Power Supply Company, but at the west section the majority of the plant is awaiting power from this Company. The labour force during the year amounted to an average of 855 white men, 7,193 natives and 140 Cape boys and Indians. The number of coloured labourers in the Company's service in December was 1,387 less than at the beginning of the year. The shortage of this force considerably restricted stoping operations.

THE OUTLOOK FOR THE NIGEL.

Lower Profits and Increased Working Costs—Manager's Estimates of Future Profits.

The twenty-third ordinary general meeting of shareholders in the Nigel G.M. Co., Ltd., was held at Pietermaritzburg last week. Mr. Leunard Line (chairman) presided, and in moving the adoption of the report and balance sheet said, *inter alia* : The total quantity of ore milled during the year was 134,450 tons. The gross revenue amounted to £213,707 2s. 11d., or 31s. 9.477d. per ton milled; the gross expenditure was £165,438 18s. 7d., or 24s. 7.317d. per ton, the profit being £48,268 4s. 4d., or 7s. 2.160d. per ton. The revenue, expenditure, and profit for the immediately preceding period showed that the gross revenue was equivalent to 32s. 7.376d., expenditure 21s. 4.850d., and profit to 11s. 2.527d. per ton milled. These figures show, on the basis of tons milled, that for the year under review revenue decreased by 9.899d., profits decreased by 4s. 0.367d., and cost of production increased by 3s. 2.467d. per ton. The reasons accounting for these results are chiefly increased cost of native labour, fall in grade of some of the best shoots and a reduction in value of accumulated slimes. I will deal with these matters separately later on. It will be observed in profit and loss account No. 2 that the profit made during the year, added to the balance brought forward from the previous year, and the items "forfeited dividends" and "profits tax overestimated," gave us an available balance of £71,668 11s. 8d., out of which two dividends of 7½ per cent., each amounting to £33,465 18s., were provided for; the sum of £12,000 was written off as redemption of extraordinary capital expenditure, and the cost of putting down another borehole during the year was also written off, leaving a balance of £24,502 13s. 8d. to carry forward to next year. The December and January profits were most disconcerting indeed, and the board, finding it somewhat difficult from the information supplied by the manager to account for the sudden decrease, and with a view to obtaining the fullest knowledge on all points affecting the mine, and to, if possible, arrive at some conclusion as to forecasting results for the current year, the manager paid a visit to the head office on February 26th, when a full discussion took place on all material points. The results of that interview are embodied in a report, supplementary to his annual report, made by Mr. Curnow, and dated February 26th, and which I will now read to you :—"Since writing my annual report for the year ended 31st December, 1911, which is more or less statistical, I beg now to submit a supplementary report dealing with certain matters which the board should be conversant with before the annual meeting. Development.—This has been fairly good in values, but deficient in tonnage. Little or no development was done during the first five months of the year owing to the native labour difficulties. This naturally is the cause of ore reserves being less than would otherwise have been the case. Devleopment in the Rand Nigel, although showing improvement in values during the year, has not disclosed any greater improvement in tonnage to what I estimated last year. Another shoot of payable ore was discovered, making five shoots in all in this property. Having regard to the fact that the western portion of the Nigel Mine has been worked to the boundary, I do not anticipate being able to increase ore reserves. Profits.—In view of the following conditions, viz. : (1) Reduced value in old slimes, (2) increased cost of native labour, (3) reduced number of stoping faces owing to reductions of tonnage of ore reserves, I estimate the monthly profit for the current year will not exceed £4,000." The manager's views on the situation, therefore, are : That, since he gave his opinion last year, he has had another year's experience of the mine, and, basing his calculations on that experience, he has come to the conclusion his last year's estimate of profit must be modified and reduced by about £1,000 per month; and that he does not anticipate being able to increase ore reserves. The fall in value of the accumulated slimes alone will account for £500 per month reduced profit, which is half the estimated reduction in the monthly profit for the year. Then, at any time from six to eight months that source of revenue will be exhausted altogether; and, although we have a large tonnage of old sands, they will inadequately fill the gap left by the disappearance of the old slimes. In my address to you for the previous year I referred to the increased cost of native labour; I regret to have to say now that, since that date, costs have gone up just as much as they did on the other occasion, and I am advised there is every probability of these charges going still higher. Then the reduction in tonnage of ore reserves makes a great difference in the breaking out of ore for the mill, for, as you are doubtless aware, if the mine is short of development, it is short of stoping faces, and, however adequate your labour supply may be, you cannot economically use it under the circumstances I refer to. I am of opinion, however, that the manager, in his supplementary report, overestimates the difficulties of the present position of affairs, and I am inclined to think he will be able to modify his views long before the end of the year, and will find that, when labour conditions are more satisfactory than they are to-day, and I have every hope that this will be accomplished soon, he will be in a position to improve on his estimates for the present year. And, in conclusion, let me say that when I view the considerable increase in the claim area of the Rand Nigel section of the property; when I view the improved development there; when I consider the importance of the discovery of the two new shoots of ore in the Nigel section and the probability for further disclosures of a like nature; when I see the improved profit for last month notwithstanding that there are still about 200 boys in excess of requirements, I am hopeful the result of the current year's operations will be satisfactory.

Vira Mines.

In the Nkandhla district work is being prosecuted on one or two ventures. The greatest interest is centred on the Vira, which commences its initial crushing on March 1st. Here development has been systematically carried on for considerably over a year, and a large staff of white men and natives have been incessantly at work accumulating ore for this crushing. The whole of this big undertaking has been under the close supervision of a well-known engineer, and the plant, though new to Zululand, has, it is understood, been entirely satisfactory in other places where similar ore has been dealt with. In the interests of Zululand mining generally, we must hope that success will crown these efforts.

* * *

It is rumoured that Capt. Baudinet, who was manager of the S.A. Silver Lead Ores of Griquatown, and who has been reporting on some Swaziland Concessions, is leaving shortly to report on some properties in Northern Rhodesia.

PRESENT POSITION OF THE ROBINSON.

Labour and Other Difficulties—Development Work on Much Larger Scale—Better Grade of Ore Mined—Increased Costs and Smaller Tonnage Crushed Reduce Profits.

The following is a comparative table of reduction operations in the last two years:—

			Working Revenue.					Working Expenditure.					Working Profit.				
Period	Tons Mined.	Tons Sorted out.	Total.			Per Ton Milled.		Total.			Per Ton Milled.		Total.			Per Ton Milled.	
			£	s.	d.	s.	d.	£	s.	d.	s.	d.	£	s.	d.	s.	d.
1910	780,030	143,530	1,326,695	18	7	41	6.367	389,939	14	11	12	2.479	936,756	3	8	29	3.888
1911	710,000	117,600	1,344,819	19	10	45	4.552	433,511	16	8	14	7.540	911,308	3	2	30	9.012

The accounts show that a net profit was earned for the year of £929,245 11s. 10d., which, with £275,889 0s. 9d. brought forward from the previous year, makes a total of £1,205,134 12s. 7d. This sum has been dealt with as follows:—Expended on property, £58,220; expended on equipment, as per manager's report, £46,153 14s. 10d.; Government tax on profits, £84,410 10s.; dividends Nos. 38 and 39, £756,250; balance of appropriation account carried forward to balance sheet, £260,100 7s. 9d. The balance of appropriation account, £260,100 7s. 9d., represents the value of cash and cash assets, excluding reserve gold, £36,528 2s. 7d., over and above the liabilities. The balance sheet shows an expenditure of £6,686 0s. 3d. against Main Reef ore suspense account. This expenditure is in connection with the mining of Main Reef ore which is packed for the present in the stopes for the purpose of supporting the hanging wall until such time as the stopes are worked out, when the packs will be removed and the cost of mining the ore debited to working costs. The directors' report states that owing to the increasing proportion which the payable Main Reef in the mine bears to the total payable ore reserves, it will become necessary to gradually increase the quantity mined from this source. As the grade is lower than the Leader and South Reef, the monthly profit will vary according to the amount of Main Reef mined, but the inclusion thereof will considerably increase the profit earning life of the mine.

Consulting Engineer's Report.

The Consulting Engineer, Mr. Percy Cazalet, writes:—As indicated in last year's report, development work has been undertaken on a much larger scale during the year under review than in the near past as a consequence of the acquisition of the undermining rights of 5.2776 claims from the Government, and the development of these is now well in hand, and should be practically completed by the end of the current year. As a consequence of this increased activity, 9,770 feet of development work were accomplished, an increase of nearly 7,000 feet over 1910; the cost of this work was met directly out of working expenses. It was found that greater expedition and convenience would be gained in hoisting operations by the sinking of No. 2 shaft somewhat, and as a consequence this shaft was deepened 37 feet. Throughout the year, while aiming to maintain a maximum profit consistent with the sound and safe working of the mine, the management has been faced with many difficulties, which, as far as this mine is concerned, though not entirely absent in the past, have not previously had the same trying effect on the operations as has been manifested this year. To indicate a few of the difficulties referred to above, I would cite the following:—(1) The Robinson, being a popular mine with natives, has in the past had a fairly good and regular supply of efficient voluntary labourers, but this year, in common with other mines of the Rand, has not been able to maintain its usual proportion of the best quality labour, and has had to rely more on the less efficient and inexperienced tropical natives. This fact has had a decided bearing on the increased costs. (2) As the mined out areas increase, the prosblem of supporting the workings, which on this mine are exceptionally wide, presents greater difficulties, and is more expensive than on mines where ore bodies are narrower. (3) The large increase in the areas of South Reef which it is necessary to mine to keep the workings in the best possible state, and aid the question of support referred to in the preceding paragraph, has also had its influence on the working costs. This reef is aften narrow, more expensive to mine, and demands more native labour than the other reefs, thus reducing the quantity of labour available for the larger stopes. Other troubles, though perhaps less markedly than the ones enumerated above, have added to make the past year's results less successful than those of 1910, and it is after taking these various adverse factors into account that I feel justified in stating that the past year's work has been eminently satisfactory. The average grade for the year has shown an increase of nearly 4s. per ton compared with 1910, but owing to an increase of 2s. 6d. per ton in the working costs, and a decrease of 46,200 tons in the crushing, the working profit shows a decline of about £25,000. The increase in grade is due both to a reduction in the proportion of Main Reef and also to the larger amount of high grade South Reef mined. Further causes of the higher costs are the large increase in development accomplished and the decreased efficiency of the tramming and shovelling work done during the year, owing both to the less efficient class of labour available and to the increasing inaccessibility of the areas still intact in the mine. A re-examination of the ore resveres in the mine as at Dec. 31, 1911, gives the following results:—Leader, 699,701 tons, value 11.1 dwts., stope width 82 inches; South Reef, 521,960 tons, value 11.8 dwts., stope width, 64 inches; total Leader and South Reef block ground, 1,221,661 tons, value 11.4 dwts., stope width 73 inches. Estimated tonnage as recoverable from old workings, stope and shaft pillars on these reefs, 305,000 tons; total, 1,526,661 tons. Compared with last year the block ground shows a reduction of about 220,000 tons, which is principally due to the excess amount of ore mined over that developed, while the values are also rather lower. In addition to the above ore reserves, the re-estimate of the payable Main Reef available in the mine gives a total of 1,307,133 tons of a value of 4.2 dwts., of which 119,896 tons is composed of broken ore in the form of packs used as temporary support in the workings. It will be noticed that the payable and available Main Reef shows a large reduction compared with last year, the reasons for which you will find explained in your Manager's report. It must be noted in this connection that the margin of profit on this reef is small, and that therefore any reduction in the tonnage available is not of the same moment as in the case of the richer reefs, and it may well be that considerations of safety may necessitate the covering up of some of this reef with sand during sands-filling operations, and also that more caving may occur to further reduce the tonnage of this reef which can be extracted at a profit. An amount of 786,384 tons of Main Reef, of a value of 2.7 dwts., classified as unpayable, though available, cannot with the present costs be considered as likely to return a profit; of this tonnage, however, about 500,000 tons have a value in the neighbourhood of 3 dwts., and it is possible that some of this ore may yet be profitably mined. Sands-filling, you will notice from your Manager's report, has been carried out on a much larger scale, and especially so since the middle of the year, when greater areas became available for filling. The Butters' Filter plant for slimes, which was commenced towards the end of 1910, was completed and put to work during the current year, and the residues from these works have only averaged about .2 dwt. since its installation, and that with a greatly increased percentage of the product treated by this plant as slimes. The ventilating fan mentioned in your Manager's report for 1910 has now been at work some considerable time, and the ventilation of the lower levels in consequence has very greatly improved, and should now allow of better health conditions in these workings.

Manager's Report.

The Manager, Mr. Paul Selby, writes as follows:—*Capital Expenditure.*—Of capital accounts the following are still uncompleted, viz.: Tailings haulage, plant electrification, sands filling, air meter house and station. The total amount remaining to be spent on these votes is £7,373, of which £5,611 is accounted for by the uncompleted portion of the sand-filling plant. *Labour.*—The average numbers working during the year under review were: Whites, skilled, 397; unskilled, 26; total whites, 423, of which 22 were employed on construction; Cape boys and Indians, 66; natives, 2,974. *Mine.*—Development.—The footage for the year, viz., 9,770 feet, is 6,965 feet greater than was accomplished during 1910. *Main Reef.*—The percentage of Main Reef mined during the year, viz., 33 per cent., shows a decrease of 4 per cent. when compared with the previous year. Besides the Main Reef which was mined, there was a net increase in the amount of this reef packed of 17,276 tons for the year, i.e., from 102,620 tons to 119,896 tons. *Sand Filling.*—The total sand filled for the year was 132,641 tons, of which 100,568 tons were lowered during the second half of the year. It is anticipated that the current year will record a decided increase over the above figures. *Ore Reserves.*—I feet that the subject of ore reserves cannot be passed without calling attention to the large discrepancy of 895,304 tons between the payable Main Reef tonnage as shown last year and that available at present. Of this difference, 148,593 tons are accounted for by the fact that more Main Reef was mined than developed during the year, thus leaving a difference of 746,711 tons, the bulk of which can be accounted for under the following headings:—Blocks which were considered payable last year but which have proved to be unpayable as stoping progressed; loss due to caving, and ore transferred from the payable to unpayable reserves, due to the higher pay limit consequent upon higher working costs. In considering the Main Reef reserves, it must be borne in mind that further losses of this reef, due to caving, are likely to occur.

THE PROGRESS OF THE VILLAGE DEEP.

Year 1911 Marks the Maximum Achievement of the Mine in Point of Tonnage Crushed—Revenue and Net Profits.

The following is a table of results of the Village Deep since commencement of reduction operations:—

	Tons Mined, exclusive of Ore from Dumps.	Tons Sorted out.		Average Number of Stamps Working.	Tons Milled.	Working Revenue.					Working Expenditure.					Working Profit.				
		Total.	%			Total. £	s.	d.	Per Ton Milled. s.	d.	Total. £	s.	d.	Per Ton Milled. s.	d.	Total. £	s.	d.	Per Ton Milled s.	d.
1905	171,746	22,385	12.290	85	159,687	240,916	4	3	30	2.083	197,128	5	9	24	8.272	43,787	18	6	5	5.811
1906	326,616	48,920	14.881	145	279,860	379,656	8	1	27	1.583	308,526	9	5	22	0.583	71,129	18	8	5	1.000
1907	328,383	56,841	16.772	165	281,380	417,782	15	5	29	8.343	341,131	8	0	24	2.964	76,651	7	5	5	5.379
1908	428,304	75,452	17.614	180	352,100	470,915	5	3	26	8.987	342,206	3	2	19	5.256	128,709	2	1	7	3.731
1909	531,500	89,107	16.732	180	444,800	555,238	14	9	24	11.589	408,605	2	6	18	4.470	146,633	12	3	6	7.119
1910	595,942	88,575	14.834	180	507,800	620,547	6	2	24	5.287	446,480	5	1	18	4.471	154,067	1	1	6	0.816
1911	670,521	101,721	15.170	180	569,500	755,785	16	5	26	6.505	530,005	17	2	18	7.360	225,779	19	3	7	11.145
Totals and averages.	3,053,012	483,001	15.690	—	2,595,127	3,440,842	10	4	26	6.212	2,594,083	11	1	19	11.903	846,758	19	3	6	6.309

The accounts show that a net profit was earned for the year of £227,332 7s. 5d., making together with £55,738 2s. 5d. brought forward from previous year, a total of £283,070 9s. 10d. This sum has been dealt with as follows:—Expended on equipment and development, £128,335 0s. 9d.; expended on property, £6,465; Government tax on profits, £16,638 14s.; dividends Nos. 6 and 7, £106,067 2s.; balance of appropriation account carried to balance sheet, £25,564 13s. 1d. The balance of appropriation account represents the value of cash and cash assets, exclusive of reserve gold £23,487 17s. 1d., after deducting liabilities. The only item in the balance sheet calling for comment is the amount of £31,032 against claim property, which represents the sum payable in six annual instalments of £5,172 to the Government in respect of the undermining rights of 7.3701 claims acquired as per last report.

According to the directors' report during the current year it is not proposed to do more development than is necessary to maintain the ore reserves, but shaft sinking must be continued in the Turf Mines section. This shaft sinking will not add to the ore reserves, but is necessary preliminary work for the future development of that section. If, as is possible, all this work cannot be covered by the present development redemption charge, it will be increased, so that the whole development expenditure will appear as a direct charge against the monthly profits.

Consulting Engineer's Report.

Mr. H. Stuart Martin, the Consulting Engineer, writes:—It will be noted that the declared profit for the year was materially increased, and that the reserve gold was substantially added to. The yield per ton milled was more than 2s. greater than for the previous year, due to improved mine grade. The development was maintained at a high rate until nearly the middle of the year, after which it was reduced, as the mine was by that time put into a very sound position as regards stope faces, and all work is now being done single shift. In spite of the present sound position as regards development, it is necessary to do certain development work in addition to that required to maintain ore reserves. The most important feature of this work is the sinking of the main incline shaft from the bottom of No. 3 Vertical (Turf Shaft), which will provide future points of attack at lower levels, as the development of the Village Deep section will probably be completed during the next two years. During the year the plant has been converted from steam to electric power purchased from the Rand Mines Power Supply Company, but in October the Power Company failed to supply the mine with the requisite amount required, with the result that since than a portion of the machinery has had to be intermittently run by steam. In July, No. 1 Incline of the Village Deep section was connected underground with the Turf Shaft, whereby the pumps in the former were released and the ventilation considerably improved. Both the Village Deep Inclines are now connected with the Turf Shaft, which is the chief work done towards making the latter the main working shaft of the company. The payable ore reserves estimated as at 31st December, 1911, are:—Main Reef Leader, 1,674,611 tons, value 6.1 dwts., stope width 62ins; South Reef 485.181 tons, value 6.0 dwts., stope width 50ins.; total, 2.159.792 tons, value 6.1 dwts. The above ore reserves may be classified as follows:—(1) Ore completely blocked out for stoping, 1.697.324 tons, value 6.3 dwts.; (2) ore fully valued, but not completely blocked out, 113,389 tons, value 4.7 dwts.; net payable ore reserves, 1,810.713 tons, value 6.2 dwts.; (3) ore contained in shaft and boundary pillars, 349,079 tons, value 5.5 dwts,; total, 2,159,792 tons, value 6.1 dwts. As a precautionary measure it has been considered advisable to include an increased tonnage in the shaft and boundary pillars. The accumulated unpayable ore in the mine now stands at 805,113 tons of a value of 2.8 dwts. per ton. The above ore reserves do not fully reflect the results of the year's development work, owing to the Main Reef Leader drives having been driven in the footwall, resulting in a considerable tonnage being blocked out which cannot at present be valued, and is therefore not now included in the reserves. The object of driving in the footwall is to secure the greater safety of the drives, and to reduce the cost of timbering them whilst stoping. In the great majority of these blocks the winzes are finished on the Main Reef Leader, so that stoping can commence at once, the only requirements to enable the ground to be fully valued being crosscut raises or boxholes, which are being put in. It is estimated that the total unvalued Main Reef Leader thus blocked out amounts to 792,000 tons, of which it is safe to assume that 80 per cent., or 633 600 tons, will be payable. During the year a great deal of attention has been paid to the South Reef, with the result that considerable quantities of payable ore on this reef have been located, chiefly by means of crosscuts from the Main Reef, Leader drives. In consequence the percentage of South Reef mined for the mill is steadily increasing. In view of the sound position of the ore reserve and the ample number of stope faces available, the prospects of the mine for the ensuing year are good, always providing there is a sufficient supply of native labour.

Manager's Report.

The Manager, Mr. J. Whitehouse, writes, *inter alia*:—The result of the year's operations shows an increase of profit of 1s. 11d. per ton milled, as compared with the preceding year, and a total increase in profit of £71,713. The improved profit is primarily due to a higher mine grade, asissted by small increases in the percentage of waste sorted out and the percentage of extraction in the reduction plant. The higher mine grade is partly due to closer mining and decreased stoping widths, which have become possible through the extended use of small rock drills, of which there are now 110 in use; the efficiency obtained by these drills has been on the whole quite satisfactory. Of the total tonnage broken for the year, 89 per cent. was broken by machine drills, both large and small. A notable increase has taken place in the amount of South Reef mined, the percentage for 1911 being 15.1 per cent. as compared with 7.5 per cent. in 1910. The value of the ore stoped from this reef has been quite up to the general average value of the mine, in spite of the fact that the values disclosed by development were somewhat lower. The full 180 stamps ran satisfactorily throughout the year, crushing 569,500 tons, with a stamp duty of 9.3 tons, whilst extraction in the reduction works averaged 95.9 per cent. Sixty stamps have been weighted up from 1,350 to 1,590 lbs. Development operations were carried out on an extensive scale, resulting in a total footage of 29,132 feet, or 5,164 feet more than in the previous year. Considerable attention has been paid to the South Reef, which has been opened up with promising results on several levels in the western section of the mine. The results in the Main Reef Leader development have been normal. The total payable ore developed for the year was 516,824 tons, and in addition 792,000 tons of Main Reef Leader have been blocked out, but not fully valued. This work can be completed by a comparatively small footage and will make a notable addition to the payable ore reserve. The development position can be regarded as satisfactory; there are sufficient stope faces in the mine to supply the full ore requirements on day shift only, and to this the improved underground efficiency is to some extent due. During the year No. 1 and No. 3 (Turf Shaft) shafts were connected, resulting in improved ventilation in the eastern and deeper sections of the mine, and at the same time concentrating the arrangements for pumping. By completing the cutting of a main haulage level on the 16th level, the ore on the lower levels of the Village Deep section will be handled with more economy and despatch, combined with a saving in labour. At the bottom of No. 3 shaft a 2,000 tons ore bin with Kimberley chutes has been made. Pumping plant for the whole of the mine is now located at this point, and a main incline shaft to serve the deeper working is making good progress. The condition of the underground workings is satisfactory, and the mine has been made as healthy as possible by the installation of a water system for laying dust; the ventilation of the mine is also in every way good and efficient. The natives employed at the No. 3 shaft section have been housed in a new compound near the shaft. Special care has been taken in the treatment of natives from tropical districts, and they have been segregated in a special part of the main compound. A considerable portion of the machinery and plant is now driven by electrical power, the more important machines being those driving the battery, an underground hoist at No. 1 shaft, and a man hoist at No. 3 shaft. Since May, a portion of the compressed air supply has been obtained from the Rand Mines Power Supply Company, and the air pressure in the mine has improved. Amongst general surface improvements that have been made during the year are staff mess quarters with comfortable accommodation, a new fire service, and fencing in of the surface works, all most useful additions to the property.

MINING MEN AND MATTERS.

Mr. Arthur Spicer has been appointed secretary to the Phthisis Committee.

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Dr. C. F. Juritz, Chief Chemist of the Union, has been unanimously elected President of the Cape Chemical Society.

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Mr. U. P. Swinburne has been appointed Acting Assistant Head of the Mines Department, O.F.S., vice Mr. J. H. Twiddy, transferred.

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His many friends will regret to hear that Mr. A. D. Bacon has resigned from the management of the Randfontein Central as from the end of this month. It will be remembered that Mr. C. B. Horwood was recently appointed joint manager with him.

* * * *

Mr. D. V. Burnett, the popular general manager of the Pigg's Peak Development Co., Ltd., has accepted an important position with the Hollins group of mines in Rhodesia—namely, general manager to Mr. R. Hollins' Rhodesia interests, with headquarters at Bulawayo, for which place he will leave shortly.

* * * *

The directors of the Modderfontein "B" G.M. Co., have kindly extended an invitation to the members of the S.A. Institution of Engineers to inspect the mine to-day. A special train will leave Park Station at 12.20 p.m., and will stop at all stations up to and including Boksburg. It will arrive at the Modderfontein "B" siding at 2.7 p.m. The train in connection with the special will leave Randfontein at 10.57 a.m. Vouchers for concession tickets from stations on the West Rand can be obtained from the Secretary, P.O. Box 6405, Johannesburg. Tickets from Park Station can be purchased on the train. Luncheon cars will be attached to the special. The annual dinner of the Institution will be held at the Carlton Hotel on Saturday, April 13. Members wishing to obtain tickets for themselves and their guests can do so by applying to the secretary.

* * * *

The ordinary general meeting of the Chemical, Metallurgical and Mining Society will be held in the Lecture Theatre, South African School of Mines, Eloff Street, Johannesburg, on Saturday evening, the 16th inst., at 7.45 o'clock. Replies to discussion: "The assay of gold-bearing cyanide solutions by electrolysis," by Mr. Charles Crichton, F.C.S.; "Notes on high duty gravity stamp mills," by Mr. P. N. Nissen. Final discussion: "Practical applications of the specific gravity or moisture flask," by Mr. H. Stadler. Continued discussion: "Notes on absorption of gold by amalgamated copper plates, cast iron retorts and amalgam trays," by Prof. G. H. Stanley, A.R.S.M., F.I.C., and Mr. M. T. Murray, M.Sc. (Mr. A. Whitby will contribute to the discussion on this paper); "Zinc dust tests," by Dr. W. J. Sharwood, A.R.S.M., M.I.M.M. Chemical paper for reading: "The luminator purification treatment of water for steam boilers," by Mr. William Cullen. Mining papers for discussion: "Accidents in Transvaal mines; with special reference to falls of ground," by Mr. J. Chilton (contributions have been promised to the discussion of this paper by Mr. E. J. Laschinger); "Some observations on ancient mine workings in the Transvaal," by Mr. T. G. Trevor, A.R.S.M., Acting Inspector of Mines, Pretoria (Prof. G. H. Stanley will contribute to the discussion on this paper).

The next monthly meeting of members of the Geological Society will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday next, at 8.15 p.m. The following papers will be open for discussion:—"The intrusive rocks of the Witwatersrand," by Mr. D. P. McDonald, M.A., B.Sc.; "The normal section of the lower Witwatersrand system on the Central Rand, and its connection with West Rand sections," by Mr. E. T. Mellor, D.Sc.; "Note on the nature and origin of the Vredehoek tin deposits, Capetown," by Mr. E. H. Nellmapius. The following papers will be read:—"Iridosmine from the New Rietfontein Mines; its analysis, occurrence, and genesis," by Mr. C. Baring Horwood, B.Sc., A.R.S.M., A.M.I.C.E. "The Palabora plutonic complex of the low country, and its relationship to the pegmatites of the Leydsdorp mica fields," by Mr. A. L. Hall, B.A. "The crystalline metamorphic limestone of Lulukop and its relationship to the Palabora plutonic complex," by Mr. A. L. Hall, B.A.

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THE FEBRUARY OUTPUT IN DETAIL.

Daily Rate of Production Compares Well with January—A Decrease in Stamping Capacity.

The gold output of the Transvaal for February was declared by the Chamber of Mines at 703,866 ozs. of fine gold, of the value of £2,989,832. Though the daily production is better, the return for February shows a decrease of 33,194 ozs., value £140,998, compared with January. The Witwatersrand produced 674,960 ozs., value £2,867,049. This decrease which is greater than for the whole of the Transvaal, is set off by the outside mines' return of 28,906 ozs., value £122,783, which is an increase over January of 1,126 ozs., value £4,785, leaving the net decrease as above. Deducting the addition to the January yield made by the inclusion of £83,952, value of gold reserves of the East Rand Proprietary Mines and New Kleinfontein, and the two days' average output, being the difference between the two months, then February stands out as £130,00 better than January. There is an improvement in the group profits compared with January. There is an actual increase of £1,317 over the longer month of January, and an increase of £21,343 compared with February, 1911. In labour there was an addition to the January total of 7,656, which fully bears out anticipations of two or three months ago. There are now 1,300 more natives at work than a year ago, but Rand needs are greater, and we are therefore comparatively worse off than we were then. The average daily yield for the Rand, it will be seen from the tabulation subjoined, was for February £98,863, the highest yet touched, and the average daily profit, as shown by the group returns only, £28,032, as compared with £88,878 and £28,272 for the corresponding month in last year, which means £10,000 per diem more value produced for slightly less daily profit.

The Salient Features.

The following are the outstanding figures in the returns:

Total output	703,866 ozs.
Value	£2,989,832
Decrease	33,194 ozs.
Value	£140,998
Rand output	674,960 ozs.
Value	£2,867,049
Decrease	34,320 ozs.
Value	£145,783
Outside districts	28,906 ozs.
Value	£122,783
Increase	1,126 ozs.
Value	£4,785
Total stamps	10,016
Decrease	52
Rand	9,420
Decrease	65
Outside districts	596
Increase	13
Tube mills	253

Labour.

There is an increase of 7,656 according to the W.N.L.A. figures compared with January, on the total employed on gold, coal and diamond mines. There is an increase on gold mines of 6,274, on coal mines of 117, while diamond mines increased their complement by 1,265. The figures for the past three months of the number employed by members of the W.N.L.A. at the end of each month read:—

	Dec.	Jan.	Feb.
Gold mines ...	178,282	184,046	190,320
Coal mines ...	8,043	7,805	7,922
Diamond mines ..	8,914	9,524	10,789
Totals ...	**195,249**	**201,375**	**209,031**

Stamps.

The stamp position again shows a decrease compared with the previous month, though proportionally greater tonnage has been crushed. The fluctuations are due to various causes, but mainly to a better duty being obtained by the increase of the tube mill work. The details of changes are as follows:—Rand.—Decrease: Cinderella Consolidated, 5; Geldenhuis Deep, 120; Jumpers-cum-Treasury, 5; Knight Central, 10; Salisbury, 55; Van Ryn, 10; total, 205. Increases: Bantjes, 10; Benoni, 5; Crown Mines, 40; Ferreira, 5; Jupiter, 5; Randfontein Central, 10; Robinson Deep, 10; Simmer Deep, 5; miscellaneous, 50; total, 140; decrease, 65. Outside.—Increase: Miscellaneous, 13; net decrease, 52.

The sources of production for February are:—

	Rand.		Outside.
Mill	£1,818,001	......	£42,439
Sands	1,022,671	......	41,245
Miscellaneous ...	26,377	......	39,099
Totals ...	£2,867,049	......	£122,783

The Progressive Output.

Total productions:

	Ozs.		
1901	238,994	......	£1,014,687
1902	1,707,661	......	7,253,665
1903	2,955,749	......	12,589,248
1904	3,779,621	......	16,054,809
1905	4,897,221	......	20,802,074
1906	5,786,617	......	24,579,987
1907	6,451,384	......	27,403,738
1908	7,052,617	......	29,957,610
1909	7,280,545	......	30,925,788
1910	7,533,843	......	32,001,735
1911	8,237,723	......	34,991,620
1912—			
January ...	737,060	......	3,130,830
February ...	703,866	......	2,989,832

Twelve Leading Companies.

The returns from the twelve leading companies show a relative proportional decrease for the shorter month. There are also some fluctuations in the order and the composition of the leading twelve compared with January. Some 220 fewer stamps were working than in January, though in the aggregate nine more tube mills were in operation, the difference being caused by 120 fewer stamps running on the Geldenhuis Deep, and the substitution of Ferreira Deep and City Deep for the Robinson Deep and Village Main, the two latter being displaced for the month. The tonnage treated was less by 90,118 tons, and the value recovered short of January by £53,123. The details of operations are as follows:—

	Stamps.	Tube Mills.	Tons Crushed.	Value.
Randfontein Central ...	800	26	211,443	251,839
Crown Mines	660	25	149,100	249,057
East Rand Proprietary ...	820	25	144,200	242,465
Robinson	250	6	44,000	108,882
Rose Deep	300	7	62,000	87,466
New Modderfontein	180	7	46,200	81,663
Geldenhuis Deep	300	7	56,710	81,246
Simmer and Jack	320	7	64,400	78,940
Nourse Mines	260	7	51,100	76,799
Village Deep	180	6	47,200	71,689
Ferreira Deep	160	4	29,140	69,476
City Deep	110	9	37,940	62,535
Totals	**4,340**	**136**	**943,333**	**1,462,057**

GROUP PROFITS.

The following are the profits returned for January and February by the mines controlled by the different groups:—

	Jan.		Feb.
Rand Mines	£206,122	......	£209,989
Rand Mines-Eckstein group	221,326	......	213,242
Gold Fields	101,429	......	111,697
Farrar—Anglo-French ...	83,223	......	89,808
General Mining	62,797	......	48,400
Barnato	59,227	......	58,273
Neumann	44,280	......	46,072
Cons. Mines Selection ...	21,373	......	23,231
Goerz	11,860	......	12,242
Totals	£811,637	......	£812,954

THE OUTPUT IN DETAIL.

The following is our usual monthly output table:—

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	11,640	60	3,281	13,937
Bantjes Consolidated	21,910	65	8,164	34,678
Benoni	19,009	50	4,462	18,953
Brakpan Mines	42,177	110	14,445	61,358
City Deep	37,940	110	14,722	62.535
City and Suburban	26,112	135	11,459	48,675
Cinderella Consolidated ...	13,640	65	4,264	18,112
Consolidated Langlaagte ...	20,216	140	6,360	27,016
Consolidated Main Reef ...	17,589	80	6,342	26,939
Crown Mines	149,100	660	58,683	249.057
Durban Roodepoort	13,114	90	3,431	14,587
Durban Roodepoort Deep ...	22,000	100	7,637	32,440
East Rand Proprietary ...	144,200	820	57,081	242,465
Ferreira	21,350	85	7.133	30,299
Ferreira Deep	29,140	160	16,354	69,476
Geldenhuis Deep	56,710	300	19,127	81,246
Ginsberg	12,507	80	4,553	19,340
Glencairn Main Reef	16,312	160	3,459	14,693
Geduld Proprietary	12,800	50	4,121	17,505
Jupiter	32,850	80	8,404	35,698
Jumpers-cum-Treasury ...	8,650	85	3,829	16,265
Knights Deep	53,000	270	11,892	50,514
Knight Central	22,600	100	5,880	24,977
Lancaster	21,450	100	5,412	22,909
Langlaagte Estate	49,710	200	13,198	56,062
Luipaardsvlei Estate	16,110	60	4,049	17,199
Main Reef West	13,520	70	5.452	23,159
May Consolidated	11,070	100	3,985	16,927
Meyer and Charlton	13,118	75	6,211	26,383
Midas Deep	2,051	20	273	1,160
Modderfontein "B"	29,500	80	11,934	50,692
New Goch	24,048	120	6,226	26,446
New Heriot	10,100	70	5,026	21,319
New Kleinfontein	37,650	220	12,493	53,067
New Modderfontein	46,200	180	19,225	81,663
New Primrose	22,500	160	7,774	33,022
New Rietfontein Estate ...	15.640	120	4,888	20,763
New Unified	10,060	60	3,812	16,192
Nourse Mines	51,100	260	18,080	76,799
Princess Estate	15,447	50	4,480	19,030
Robinson	44,000	250	25,633	108,882
Robinson Deep	47,300	210	18,076	76.782
Randfontein Central	211,443	800	59,288	251,839
Roodepoort United	27,263	50	6,493	27,581
Rose Deep	62,000	300	20,590	87,461
Salisbury	—	—	327	1,389
Simmer Deep	44,350	110	9,787	41,573
Simmer and Jack	64,400	320	18,584	78,949
Simmer East	28,300	130	5,788	24,586
Spes Bona Tribute	5,300	40	1,458	6.193
Van Ryn	37,500	125	12,170	51,695
Village Deep	47,200	180	16,877	71,689
Village Main Reef	29,950	220	14,534	61,736
Vogelstruis Estate	9,092	70	2,825	12.000
West Rand Central	2,008	20	887	3,768
West Rand Consolidated ...	27,300	100	7,564	32,130
Witwatersrand	34,850	220	9,590	40,736
Witwatersrand Deep	36,020	245	11,514	48,908
Wolhuter	26,500	120	9,211	39,126
Miscellaneous producers ...	—	110	6,210	26,377
HEIDELBERG—				
Nigel	12,000	75	4,467	18,983
Sub Nigel	4,150	30	1,852	7,867
BARBERTON—				
Barrett	—	—	229	973
Sheba—Rosetta	1,716	20	461	1,858
Sheba	5,620	65	2,799	11,889
Worcester Exploration ...	4,100	40	1,212	5,148
LYDENBURG—				
Glynn's Lydenburg	2,897	20	1,569	6,517
Transvaal Gold Mining Estate	12,301	75	7,110	30,201
KLERKSDORP—				
Miscellaneous Producers ...	—	271	9,305	30,099

Goerz Group.

Results of operations of the Crushing Mines comprising the Goerz Group for the month of February, 1912:—

COMPANY.	STAMPS.	TUBES.	TONS.	VALUE.	PROFIT.
May Consolidated...	100	—	11,070	£16,792	£7,203
Princess Estate ...	50	4	15,447	18,793	—
Lancaster West ...	100	3	21,450	22,935	984
Geduld Proprietary	50	2	12,800	17,464	4,055
Totals	300	9	60,767	£75,984	£12,242

Princess Estate and Gold Mining Company, Ltd.—Net Loss £1,678.

Neumann Group.

The following are particulars of the results achieved by the Crushing Companies in this Group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Wit. Deep	36,020	£48,268	£13,707
Wolhuter	26,500	38,479	15,036
Main Reef West	13,520	22,816	7,484
Consolidated Main Reef ...	17,589	26,511	7,004
Knight Central	22,600	24,594	2,666
Treasury-cum-Jumpers ...	—	—	175
Total for Group			£46,072

Reserve Gold.—Wolhuter, 2853.227 fine ozs.; Consolidated Main Reef, 352.710 fine ozs.

Knight Central.—The full number of stamps could not be run as the native labour force was still inadequate.

The Wolhuter Gold Mines.—Owing to necessary renewals to the east incline headgear and hoisting engine a lower tonnage was mined during the month, and a smaller percentage was drawn from the richer stopes in that section; 845 ounces were therefore taken from the Gold Reserve to maintain the usual monthly profit. The repairs in question were completed on the 8th February and milling operations have since continued on the normal basis.

The Minister of Mines has withdrawn from prospecting the farm Annex Leeuwpan No. 48, District Standerton, Mining District of Heidelberg, Transvaal Province, which was thrown open to prospecting under Government Notice No. 20 of 1909.

THE MINES AND THE DUST EVIL.

What is Being Done—How Mines can be Made Healthy—Mr. Jourdan's Views—Importance of Discipline—Need of Observing Regulations.

At Saturday night's meeting of the South African Institute of Engineers, Mr. Jourdan, Inspector of Mines, replied to the discussion raised by his paper on "The Prevention of Dust in Development Drives of Mines during Drilling Operations." Mr. Jourdan said that at one of the meetings it had been alleged that the system evolved on the Nourse Mines and adopted largely by Mr. Judge had broken down since Mr. Judge had left that property. Such was not the case. On the contrary the new underground management recognised that it had inherited a good legacy, and had set about improving the system. Improvement had been effected by erecting large tanks for the different district and laying larger pipes where required. Farther, each developer was now held responsible for the maintenance of his water pipes, and the pipefitter on his rounds supervised the work of the miner. That did not keep the miner doing nothing, and effectually removed the temptation to drill dry holes while waiting for the pipe fitter, who might be wanted in half-a-dozen places at the same time. As the principle now known as the Nourse Mines Dust Prevention System had not been disputed, there remained very little for him to reply to. He thought he could assert without fear of contradiction that all those who had considered the system had admitted the claims to be justified and from the general tenure of the remarks there was the unanimous conclusion that water and ventilation were to be the two main agencies for solving the dust problem. He was pleased to state that the system advocated had been adopted on other mines, notably, the Village Deep and Robinson Deep, and he had the authority of Mr. Whitehouse, manager of the Village Deep, to state that he had proved the claims of the system by personal demonstrations and that he was so satisfied with results that he had appointed an official to do nothing else than attend to the water supply and seeing that water always reached the development faces. At the Robinson Deep, too, the system had been given a fair trial and found successful, so much so that some of the men interviewed had declared that they would not again drill without water, as they found they could now drill back holes in less time than down holes. That being so he (Mr. Jourdan) had recommended the application of the system to the wet holes also. It was wise to lay pipes of suitable dimension in the drives. Pipes of 1in. and even $1\frac{1}{2}$in. diameter would be necessary in the bigger mines; smaller dimensions would prove inadequate and the pipes would soon have to be scrapped. He was somewhat disappointed that the matter of blasting the cut and round on different shifts had not been discussed at all. He felt sure that if some uniform practice could be thought out and put into operation whereby miners would never go through the smoke, dust and fumes after blasting the cut to blast the round, the developers would reap great advantage and their lives would be lengthened, even if nothing else were done. For such a system to be in vogue more faces, of course, would be needed to prevent any man being idle. Possibly such a system might be evolved under the new Eight Hours Day Act.

The "Automatic Policeman."

He was in the fortunate position to bring to mention a very useful invention by a local engineer, Mr. J. Berry. He (Mr. Jourdan) had not seen the apparatus actually at work, but he had been told by Mr. A. Vaughan, Chief Inspector of Machinery to the Mines Department, that there was no reason why the idea should not be successful. It might be called the "Automatic Policeman." In Mr. Berry's device the compressed air valve was opened only when the pressure in the water pipe was sufficiently great to overcome the pressure of an adjustable spring. When the water supply failed the spring closed the valve and kept it closed until the water pressure again opened it. Hence the miner could not get air to work his drill unless the water was on. Described in greater detail the device consisted of an iron box provided with a lid and padlock. The box contained a brass cylinder with piston of suitable area connected to a lever on the air cock which was also enclosed in the box. The lever was connected to a spring which kept the air cock closed when water under pressure was not circulating. The cylinder was connected to the water pipe, and when the water was turned on the piston travelled to the end of the cylinder and gave full opening to the air main. When the water supply failed the spring closed the air cock, which remained closed until water returned to open it. The pressure to work the piston might be anything from 2 to 200 lbs., limited only by piston area and strength of material. A bye-pass was provided on the air cock of $\frac{1}{8}$ or $\frac{1}{4}$ inch in bore to provide sufficient air for ventilation if desired. The box lid had two openings to indicate position of the handle or lever of the air cock. The padlock was provided so that only those in authority could interfere with the working parts. Should an accident occur, such as gassing, the workman could smash the lock, open the box, unhook the spring and turn on the air. The water connection for operating the device might be made close to the rock drills, so that the turning on of the air was effected automatically by turning on the water supply. By placing the water valve on the far side of the box from the machine one could effectively prevent the miner from drilling without water at his face in cases of raising, box-holing, or backstoping. When coming away from a blast the air would be shut off (except the bye-pass) when the valve was shut off at any point on the level. In that case the water valve was placed on the machine side of the box. The method was applicable when the wet holes were being put in in the drive face, inasmuch as it permitted of one having air without water. In box-holing, raising or stoping, the native might find the hose somewhat cumbersome if he were alone. To assist him Mr. G. H. Smith, Mine Captain of the Ferreira Gold Mine, had brought out a simple and effective device.

The question of discipline had loomed very largely in the discussions. Now, as a public servant, he felt that he should present his original paper as a simple statement of fact about a system which could and did prevent the formation of dust from one source at least. For this reason he had avoided all criticism of, or allusion to classes of persons or practice on the mines, that might be of a contentious nature. Once the discussion started members frequently indulged in such criticism and gave to the institution their experiences and opinions of men and matters. That having occurred, he felt that it was again his duty to express his opinions and experiences on the same matters. He was entirely at one with the general sentiment that had been expressed that for any system on a mine to be a success it was necessary for proper discipline to be observed on that mine, and good discipline would be necessary to apply beneficially the water and ventilation which one considered to be the two main agents for eradicating the dust evil. Now the members of the institution were representative to a great extent only of the mining officials, as far as mining proper was concerned, and for that reason he was afraid that that the tendency generally had been to allow prejudice to play a large part in some of the opinions expressed, and to see matters only from the point of view of the manager, mine captain, or shift boss. To the trained eye it soon became apparent that the employes on a mine reflect the discipline of that mine. Take a mine, for instance, where as one got out of the skip in semi-darkness on to a dirty station one stumbled over a piece of timber on to an old rail or some other collection of rubbish. Gradually one would get one's sight and would see the whole station littered with every conceivable article. One would go into the drives and would see just the same thing—dirt and rubbish everywhere. It stood to reason that that mine would be void of discipline; Europeans and natives alike would be disorganised and carry that same idea of slovenliness into their working places and into their work. Take, on the other hand, a mine where one stepped into a clean, well-lit, white-washed station, the drives clean, and all the workings orderly and neat. Surely such a condition tended to affect the discipline and the health of the employes for the better, as well as their efficiency.

How to Get Discipline.

It was perfectly clear that the mine officials were the parties solely responsible for the two opposite conditions described, and as the station was the point where discipline commenced, the matter of enforcing it there and throughout the mine rested entirely with the manager and his subordinate officials. If the officials themselves had no desire or time for orderliness and cleanliness, they could expect to find none of those attributes in persons under their charge. The station was the point where the visitor made his first estimate of the discipline on a mine, and that estimate was seldom far wrong. Now, if the officials of the mines really earnestly desired discipline they would get it by being united and firm throughout the fields at every point. He had made it a special point to ascertain the opinion of persons on a point raised by Professor Lawn, who had said in so many words that the native was not amenable to discipline. His (Mr. Jourdan's) own experience and that of all those whom he had approached was directly opposed to that. Speaking upon a cognate subject at the Chemical, Metallurgical and Mining Society, Mr. Cullen, manager of the Modderfontein Dynamite Factory, said, *inter alia*: "Show a native only once what you expect of him, but do it thoroughly by people who can speak his lingo, and he will do that day after day and month after month." If the officials insisted on discipline and impressed that on the miner, the miner in turn would insist on discipline and impress that on the native. The native was so easily punished; it only took a loafer's ticket to do so, and with such a threat before him he would do what he was told day by day. There were some officials who regarded the observance of the Mining Regulations as a secondary consideration to that of getting out ground. There were officials who did not pay that attention to the water supply which it warranted. Such men were the cause of the slow progress which was being made towards a better state of affairs, and it was they who hampered and undid the efforts of the larger class of officials who were trying their level best to ameliorate the conditions now obtaining. The statement could be proved by referring to the prosecutions and convictions in the Police Courts. If any mine really wanted discipline and made a determined effort, it would have it; but there would have to be no overlooking, no condoning, no favouring, and above all there would have to be loyalty and uniformity among the mines. Let a standard system of discipline be adopted right along the Reef and the dust evil would be overcome and phthisis and accidents would diminish.

Breaches of the Regulations.

The water and ventilation regulations were the most important. He was sometimes called upon to institute prosecutions for breaches of one or more of those regulations, and he felt that he ought to state that there should never be a shadow of doubt in any such prosecution that the mine was on the right side. There must be no truth in the assertions one sometimes heard that men were dismissed for stopping work for such reasons as lack of supply of water, lack of pressure of water, and the hose not reaching the face. Under those circumstances the miner had got to be safeguarded, for he was doing what was required of him by the law of the land. A new era in the history of the battle against the dread industrial distase was being entered, and it should be tackled conscientiously. There should be no recriminations, but instead co-operation, whether as Government officials, mine officials, or miners. If a miner disobeyed mining regulations let him be punished by the mine officials who watched him, and if the mine official did not come up to what was required of him, let him be reported and punished too. Inspectors could not be everywhere, and they depended on all parties for the maintenance of discipline in all ranks. His only desire in making such statements had been to try to speak out and so help to show matters up as they really were, or at any rate as they presented themselves to him, and to assist in the solution of the great problem by endeavouring to expose what was erroneous.

Mr. Jourdaan was accorded a hearty vote of thanks.

"S.A.M.J." ANNIVERSARY NUMBER.

Special Competitions—An Interesting Announcement.

Essay Competition.

In connection with the issue of our twenty-first Anniversary Number, which will be published in June next, four prizes, each of £3 3s., are offered for the best essays received on some aspect of—

(a) Mining;
(b) Metallurgy;
(c) Mechanical Engineering;
(d) Electrical Engineering.

One prize will be given for the best contribution received under each of the above headings. Essays must be written with special reference to the mineral industries of the Union of South Africa, Rhodesia, German South-West Africa, Portuguese East Africa, or the Katanga region of the Belgian Congo. They must be of topical and South African interest. A very wide range of subjects is thus open, and it is hoped and believed that many valuable contributions will be submitted. The winning essays will be reproduced in the Special Anniversary Number of the *South African Mining Journal*, and will thus find a place in a production which will be remarkable in the records of South African journalism. The attention of competitors is directed to the following rules of the competition:—

1. Contributions must reach this office not later than March 31st, 1912. They must be addressed: "Anniversary Department, *South African Mining Journal*, P.O. Box 963, Johannesburg, Union of South Africa," and marked "Essay Competition," in the top left hand corner.

2. Contributions must be of not more than 1,500 words in length.

3. It must be distinctly understood that the decision of the Editor and Editorial Staff of the *South African Mining Journal* and of such judges as may be asked to adjudicate will be final and absolute.

4. Under no circumstances can responsibility be recognised for the safe return of manuscripts. At the same time every endeavour will be made to secure their safe return, if a fully stamped and addressed envelope is enclosed.

5. The right is reserved to reproduce in any issue of the *South African Mining Journal* all or any of the contributions submitted. All essays reproduced will be paid for at usual rates.

Photographic Competition.

In connection with the same issue a prize of £2 2s. will be given for the best photograph illustrating some aspect of: (a) Mining; (b) Metallurgy; (c) Mechanical Engineering; (d) Electrical Engineering. Photos must be of South African interest and must be of topical value. The winning photograph will be published in the Special Anniversary Number of the Journal.

The attention of competitors is directed to the following rules:—

1. Photographs must reach this office not later than March 31st, 1912. They must be addressed "Anniversary Department, *South African Mining Journal*, P.O. Box 963, Johannesburg, Union of South Africa," and marked "Photo Competition" in the top left hand corner.

2. The size and shape of photos submitted is left entirely to competitors.

3. It must be distinctly understood that the decision of the Editor and Editorial Staff of the *South African Mining Journal* and of such judges as may be asked to adjudicate will be final and absolute.

4. In no case can photos submitted in this competition be returned, and the right is reserved to reproduce all or any photos received in any issue of the *South African Mining Journal* without payment.

In all cases in which photos are reproduced in connection with this competition the name of the photographer will be acknowledged.

West Rand Proprietary Mines.

At the tenth ordinary general meeting of the West Rand Proprietary Mines, Mr. S. B. Dowling, the chairman, said: The report now presented for your consideration and approval and which deals with the year ending December 31, 1911, is, of necessity, of a very brief nature, as no matters of importance intimately affecting your company have transpired since the date of the last annual meeting. You will notice that no change has been made in the capital of your company, which stands at £60,000, and your property is also unchanged, excepting that your holding in the farm Cyferbult has been defined, and you have now a divided three-quarters of the farm, in extent a little over 1,100 morgen, instead of an undivided interest. Your other holdings are the same as reported to you at last meeting and consist of two portions of Rietvallei, in extent, 1,331 morgen and a dividend half of Thys Zyn Doorns measuring 2.144 morgen, the total extent of your properties being close on 5,000 morgen. Reference is made in the report before you to the prospecting operations that were actively prosecuted on the farm Cyforfontein about this time last year, and which were of a very encouraging nature and seemed likely to very considerably enhance the value of your properties, but I regret to say the satisfactory results that were then being obtained did not continue and I now understand the work has been entirely abandoned.

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Rhodesian Section.

LATEST MINING NEWS.

A New Manager at the Bush Tick—Increased Outputs and the Railways—The British Empire Claims—Points from Mr. Mitchell's Speech—Oceola Flotation—Giant Mines Costs and Profits.

Speaking of the gold output of Southern Rhodesia and the likelihood of an increased production, Mr. Geo. Mitchell remarked the other day that an early or marked rise in the gold yield is not at the moment expected, but it is evident that with the developments which are now proceeding on all sides, with the prospect of better conditions in the labour market, and with the projected railway extensions, which will bring within easy reach some of the larger outlying properties like the Arcturus, Golden Kopje, Kimberley Reefs and Shamva, the day of very largely increased gold declarations is approaching. In this connection it is interesting to learn that the Mazoe railway extension has now reached Rockwood, some eight miles in the direction of Kimberley Reefs. The peg denoting the site of the station at Kimberley Reefs was driven in last week by Mrs. Thurlow, with a mallet which is now being plated and engraved, so that it may be kept as a souvenir of the occasion. This railway line, it is hardly necessary to remark, promises more than any other to increase the gold output of the country.

* * * *

According to a Rhodesian exchange the reef on the British Empire claims, which are situated three and a half miles from Gwelo, has been cut at 70 ft., panning an "easy" ounce over 30 inches. Several cuttings have been put in over a strike of 600 yards, and some pannings are exceedingly rich. There is a sister reef between the side-lines with a 200 yards outcrop. A shaft has been sunk to 30 ft. showing a width averaging 6 ft. The averages are said to be 5½ dwts.

* * * *

Speaking at the annual meeting of Rhodesia Chamber of Mines, held in Bulawayo a few days ago, Mr. George Mitchell had some interesting and instructive remarks to make regarding the gold reef claims registered, etc., during last year. On this subject Mr. Mitchell remarked: Through the courtesy of the Secretary for Mines, official figures in regard to Mines Department transactions during the past year are available. The number of gold reef claims registered during the year 1911 was 38,084; 58,328 claims were forfeited; and 101,472 were current at the end of the year. The number current at the end of the year shows a net decrease of about 20,000 claims as compared with the corresponding date in 1910. The explanation of this is very simple. At the time of great rushes such as those which took place when the Eldorado, the Shamva, and the Enterprise schists were discovered, many thousands of claims are pegged and registered which are afterwards abandoned. No doubt this is what has been occurring, and as the weeding out process of claims proceeds more forfeitures will ensue. The reduction of claims current by 20,000 is not therefore any indication of a decline but rather of a strengthening of the position. A striking increase in the number of claims pegged for base metals is shown. At the end of 1910 there were 8,071 such current, and at the end of 1911, 29,812. Over 8,000 claims were forfeited under this heading.

* * * *

Proceeding, the retiring President, who by the way has been elected to the chairmanship of the chamber for the fifth time, stated:—"More striking, however, as indicating the solid progress of development work (to which reference has already been made) are the statistics from the Mines Office regarding inspections: 41,870 gold claims took out first inspections by work, representing a total of about 125,600 feet; 35,748 claims took out subsequent inspections, the footage represented being approximately 214,500 feet. The total footage declared for inspection purposes on gold claims was thus about 340,000 feet as compared with 273,000 feet in 1910, and 183,000 feet in 1909, or an increase in two years of 85 per cent. The strength of the position is emphasised even more by the returns of inspections by payment. In 1910 first inspections were paid on 26,000 claims and second inspections on 27,600. In the past year the figures for first inspections were 14,435 and for second inspections only 2,205. As regards base metal claims the amount of work which has been accomplished is apparent when it is stated that 4,102 claims took out first, and 2,468 second inspections by work. The corresponding figures for 1910 were 2,090 and 2,643 respectively, an increase in the first case of 96 per cent. The decrease in the number of second inspections is doubtless owing to such not yet being due in respect of many of the tin claims registered during the year on which work is now proceeding. It should be pointed out that the footage given is exclusive of any work accomplished on any mines in which the British South Africa Company's interest has been commuted. As these include all the largest producing mines in the country, it will be realised that the footages given do not in any way represent the work done. Moreover, it should be remembered that all footage done is not declared at once, but generally only sufficient to protect the claims until the next inspection falls due. Were statistics in regard to this available there is not the slightest doubt that very many hundreds of thousands of feet of work would be added to the amount of work given."

A Typical Prospecting Camp in Southern Rhodesia.

* * * *

Yet another Rhodesian "small mine" is being floated in Salisbury with a small but seemingly sufficient capital. The latest aspirant for flotation honours is termed the

Oceola Gold Mining Company, Ltd., and the claims to be acquired and worked comprise four blocks adjacent to each other, and designated the Oceola, the Tat, the Tat S.W., and the Thornhill. They are situate in the Mazoe district, about three miles from the Jumbo railway station. The capital of the company has been fixed at £8,000, divided into 16,000 shares of 10s. each. Of these the vendors take 6,000 shares, 8,000 shares are offered for subscription, and 2,000 are held in reserve. From the proceeds of the issue £1,000 is to be paid to the vendors, to recoup a portion of the outlay which has already been incurred, making the total purchase price of the property £4,000. The directors of the company are Mr. E. C. Windley, Messrs. Mumford and Epton, who, being interested in the sale of the claims, will not join the board until after allotment, and Mr. A. R. Liddle, of Salisbury. It is proposed to erect a three-stamp mill, and it is estimated that a profit of £4,000 can be earned during the first six months' running. Reports by Messrs. Mumford and Epton and Mr. H. Fraser Roche accompany the prospectus. From the first-mentioned report it appears that the property is pegged on old workings, from which ore has been extracted to a depth of 150 feet. A main shaft is driven to 114 feet, and a drive, put in 120 feet to the west and 190 feet to the east, exposes the reef for the whole of that distance. The reef averages for 140 feet 30 dwts. over 12 inches; the face value of a rise assays as high as 140.7 dwts. over 9 inches. The pay chute, moreover, is directly under the old working. Messrs. Mumford and Epton estimate that there are 1,600 tons of ore above the 114 feet level, which, they state, should produce a profit of from £6,000 to £7,000.

* * * *

The estimated profit on the Giant for January is returned at £10,055, which is equal to 17s. 8d. per ton as against 19s. 2d. in December. Working costs were 14s. per ton; in December they were 13s. 2d.

Antelope G.M. Co.

A statement of developments, etc., to December 31 last gives the quantity of payable ore developed as 115,000 tons, of an average assay value of 10 dwts. per ton. A decision with reference to the erection of a reduction plant is to be taken as soon as Mr. Piper has had an opportunity of conferring with Messrs. Jones and Brett, and of advising the board thereon. On the nomination of the Gold Fields Rhodesian Development Company, Mr. R. G. Fricker and Mr. A. McLennan have been appointed members of the board.

Bwana M'Kubwa Copper.

In the course of a circular to the shareholders the secretary states that the board proposes to proceed with the erection at the mine of plant capable, to begin with, of dealing with 200 tons of ore per day. It is estimated that about eighteen months will be required for the completion of this plant, but the board is arranging for an instalment of the plant to be erected with sufficient expedition to make it practicable to treat 75 tons of high-grade ore per day before the end of this year.

Bucks Reef Gold Mines.

The Resident Engineer's report for 1911 states that the results of operations on the mine for the year 1911 have been disappointing. As both the Prestwood and Bucks shafts on the bottom levels are over 100 feet from the reef, and as this distance will be greater in the levels below, the starting of underground inclines in both mines should be considered as early as possible. All work has been stopped on the Beaufort, as results obtained in this section were poor. Further work must be done on the Bucks West before the nature of this shoot is clearly disclosed. Developments on the 2nd and 4th levels have shown a very erratic ore body. Unless the Prestwood and the Bucks West shoots open up more favourably in the next few months, it will be hardly possible to keep the mill fully supplied with ore throughout this year. From the position of the mine at the end of the year, both as to developments and ore reserves, the working results for the current year may be expected to be even less favourable than those for 1911. At the annual meeting last week, Mr. W. H. Dawe said, *inter alia*: "The consulting engineer refers to the future prospects, and it is evident that unless the Bucks West shoot opens up favourably, and the Prestwood improves during the next few months, there will be difficulty in keeping the mill fully supplied with ore throughout the year. It is impossible to forecast the working during the next few months. I have referred to the uncertainty which exists in quartz mining, and can only hope that as we have experienced these disappointments during the past year the present work may disclose a more satisfactory position."

Rhodesian Fields and Rand Firms.

The various amalgamations recently announced, coupled with the difficulties and depression on the Rand, have created a stampede on the part of these Rand firms who, a couple of years ago, were eagerly rushing representatives into Mashonaland, says a Rhodesian paper. Messrs. Goerz and Co., Albu and Abe Bailey are retiring from the country, which will, in consequence, be the poorer for the loss of such well-known mining engineers as Messrs. A. S. Wheler, Montagu Groves, J. H. Ronaldson, and Durrel, although it is hoped that some, if not all, of these will remain on in other capacities. As to the effect on the mining industry of this new development, opinions vary, but it can scarcely be immediately advantageous, and may be very serious. There can be no doubt that the advent of these and other firms proved [illegible] great stimulus to prospecting, and while the results of the boom in this direction have on the whole been disappointing, it has necessarily increased our knowledge of local gold-bearing formations and so will be of the greatest future value. The truth is that these big concerns came to look for big properties and failed to secure them; and since the temptation to convert mines of moderate capacity into big companies does more than anything to discredit a mining industry, the present upheaval may do good in the long run by pointing the way in th eright direction. A new local company, the Oceola Gold Mining Company, Ltd., whose prospectus is issued this week, seems to be starting on the right lines. A capital of £8,000 indicates a sense of moderation on the part of vendors and promoters which must command respect.

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will be treated in confidence.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Anthracite Coal.

To the Editor, *South African Mining Journal.*

Sir,—Referring to enclosed cutting, which appeared in this week's edition of your journal, it appears you are not aware that there are already two producing anthracite collieries in South Africa, one of which I am representing. The analysis of our anthracite is as follows:—Moisture, 4 per cent.; sulphur, 1·9 per cent.; volatile matter, 5·3 per cent.; fixed carbon, 79·2 per cent.; ash, 9·6 per cent.; total, 100 per cent. Specific gravity, 1.56; calorific value, 13.01 per Mahler's bomb calorimeter. The colliery has been producing for the last two months, and a number of mines employing gas suction plants are using our anthracite to their entire satisfaction. The colliery is situated five miles from Ermelo, and connected by siding to the Ermelo-Piet Retief line. I should feel obliged if you would kindly give this letter publication, so as to convey to your readers the fact that there are other anthracite mines in the Transvaal capable of filling "a long-felt want." Thanking you in anticipation.—I am, etc.,

The Mary Anthracite Colliery Co.,
per A. KATZ,
Sole Representative.

Chartered Assets.

A SHAREHOLDER'S PERTINENT QUERY.

To the Editor, *South African Mining Journal.*

Sir,—The issue of the report of the Chartered Company for the year ended March 31st, 1911, has been received with equanimity; the report has had no effect upon the market or upon the price of Chartered shares. As a matter of fact, there is nothing to occasion a rise in the shares or to depress them. The excess of revenue over expenditure is given at £170,610, as compared with £22,923 in the preceding year. It must, however, be realised that between eighty and ninety thousand pounds has to be written off in respect of the company's holding of shares in the African Transcontinental Telegraph Company, which has gone into liquidation. As a shareholder in the company, and a Rhodesian, I think it is high time that the directors of this vast enterprise published some full and explicit statement setting forth the holdings of the B.S.A. Company in the various subsidiary concerns in which the Chartered Company is interested. The African Transcontinental Telegraph is but one of many scores of such enterprises. There are holdings in mines, in commercial undertakings, in farms, in railways, etc., but the extent of the interests and their value is presumably a state secret safely kept within the confines of London Wall Buildings. To the great majority of small shareholders, the assets and operations of the Chartered Company are as little understood as the future political status of this country is assured. It is difficult to consider the British South Africa Company as a pure commercial undertaking: in fact, the industrial and administrative functions of the company are so interwoven that they cannot be divorced. What I and many other small holders of bearer shares would like to know is when do the Royal Charter granted in 1889, and the supplemental charter of 1900, expire? In other words, for how long will the company in which we are shareholders continue to administer Rhodesia? Shareholders have waited patiently for many years for a dividend, and no distribution has been forthcoming. The surplus earned during the last year or two is being put back into the country. From the point of view of Imperialism—and I think the great majority of Rhodesians are Imperialists—this is very good business for the great firm of John Bull and Company. But a few of us are shareholders as well as Imperialists, and it is a most vital matter to us to have some idea of the true significance of the charter. When that mysterious right or lease of the company terminates we shall, I take it, still have an interest in a vast number of undertakings, but what those undertakings are, and what benefit we are likely to derive from them, are matters in which we are very much in the dark. Perhaps you could obtain some information for me on this point through your London office.—I am, etc.,

"A RHODESIAN."

Bulawayo, March 9, 1912.

Working Costs as Affected by Changes on the Mines.

To the Editor, *South African Mining Journal.*

Sir,—There is one aspect as regards working cost on the Rand, which seem so far to have been overlooked, but which, nevertheless, must have a far-reaching effect on the cost of production. I refer to the numerous changes constantly taking place on the mines along the Reef. Recently we had a considerable amount of discussion as to how far accidents were, to a certain extent, effected by changes. In this letter I will try to show how working cost is detrimentally effected by the same cause.

We know, for instance, that the longer a person or persons are employed on one mine and perhaps on one particular job the greater an expert he becomes. Take a hammerman running a stope. When he starts work he has many new things to learn; he must get acquainted with his boys, he must know what boys can drill, 7 hands, 5 hands, and who the loafers are. The reason why he must know is so that he can get the greatest amount of efficiency out of his boys; for instance, a miner who does not know his boys is liable to place a boy who only drills 5 hands, where he ought to have 7 hands, and so on. Again he has to learn the nature of the ground that he is mining, which, as we all know, varies very greatly, both as to breaking and hardness. It will be readily seen that all this takes time to learn; in the meantime he is not getting the best work out of his boys, and is probably using considerably more explosive than needed, all which will effect cost.

Take a machineman running say, three machines in a stope. More than likely the machines have been idle for a shift or two. The man comes down and finds part of his gear lost, stolen or strayed, and with no means of getting it replaced for that shift; so another shift is lost, not only to the miner, but also to the company. It must not be forgotten that a certain amount of capital is invested in plant, and whenever that plant or portion of it is laying idle loss takes place.

I will take another case; a pipeman is started, he goes underground and can find nothing of what he wants. The man before him had, of course, places at different parts of the mine at which he used to leave his pipefittings, and this new man knows nothing about them, so he simply orders a new stock. By the time he discovers those fittings they are so corroded that he considers them useless and orders more. While in some mines there seems to be an excellent system of work in regard to pipework; in others it is the merest happy-go-lucky system. You can hardly go into any mine underground but what you could lay your hand on pounds worth of fittings which are considered useless, but which, nevertheless, under better management, could be used, and charges kept down. Now most mining men will readily agree with me that all those things help to raise working cost. I would, therefore, suggest that when a man is efficient, or fairly so, to give him such pay and such working conditions as will induce him to stop even if he is not an expert, and even if he does not know everything, let the man or men who are his bosses bear with him and teach him anything he does not know. And this brings me to another point. Much has been said about the efficiency of bosses—here let me remark that as far as my experience goes, it goes it show that in a great many cases the underground boss is anything but efficient regarding his duties—too many bosses jobs are contracted through influence, and not based as they ought to be on experience and merit. We will take as an example a shift boss. Now, according to the new regulations which came into force on the first of December, we find that great responsibility is placed on his shoulders, and rightly so, because he is the one man who must see that safety is assured in every respect in his section. Now I take it that the greatest skill and efficiency is required by such a person to perform that work. In other words, he must be a miner; and when I say a miner I do not mean a machineman, hammerman, timberman, pipeman, pumpman or trackman, but one who is intimately acquainted with all of those different branches of mining, so that he is able to instruct and know how a job ought to be done. When you have such a man stick to him and pay him sufficient remuneration to make it worth his while. Such a man will not be likely to fire a man on the slightest provocation, because he has been through the mill himself, and knows the difficulty that besets a man in the different branches in which he is engaged. When we find then, that we have good and experienced bosses, we may confidently look forward to a greater efficiency and contentment of mind among the workers, and then, but not till then, may we look forward to a general decrease in working cost.—I am, etc.,

W. BERTHELSON.

ANSWERS TO CORRESPONDENTS.

"P.L.J." (London).—The Chairman of the Company has communicated with you.

"E.F." (Bloemfontein).—The syndicate went into liquidation last year, and the shareholders got nothing.

"D.L." (Pretoria).—Your letter has been handed to the Coke Co., who will, no doubt, duly reply.

"W.F." (Pretoria).—Thanks, will use.

"P.A.W." (Shangani).—Many thanks for article and photos, which are very welcome.

"F.S.P." (Louw's Creek).—Your note has been handed to the agents. An advertisement, however, is most likely to achieve your object.

New Heriot.

The results of the year's operations of the New Heriot show a gross profit of £114,080, as against £107,504 for the previous twelve months, the increase being £6,576. The working costs of current treatment, excluding accumulations, amounted to 20s. 5d., as against 19s. 11d. for 1910, but as the recovery was increased by 1s. 8d. per ton, the total profit was 1s. 2d. per ton more. The estimate of payable ore reserves as at December 31, according to the consulting engineer, was as follows:—

	Tons.	Dwts.	Stoping width, inches.
North Reef	12,708	9.2	61
Main Reef	96,445	6.7	91
Main Reef Leader	279,607	9.0	42
South Reef	180,956	8.3	41
Total	569,716	8.4	48

The tonnage shows a substantial improvement over the figures for the previous year; the value remains the same. In addition to the above tonnage it is estimated that, at December 31 last, there were developed 186,493 tons, of an average value of 3 dwts., which represent the accumulated unpayable reserves in the mine. The north reef, referred to in last year's report, has been carefully prospected, but with no satisfactory result. The amount of payable ore in this reef is not large. A satisfactory feature of the year's working has been the good values obtained in opening out the ground below the 8th level. The underground workings are in good condition, and provided the native labour force is not unduly diminished, indications point to an improvement in the coming year on the results obtained for 1911.

The acting manager reported that the average working profit, excluding treatment of accumulations, was 14s. 1.5d. per ton milled, as compared with 12s. 11.5d. for the previous year—an increase of 1s. 2.0d. per ton, or a total of £4,985. The workings of this mine, above the 8th level, are unsuitable for machine stoping, and a plentiful supply of native labour is necessary for their safe and economical working, as also to continue the work of reclamation in the upper levels. The scarcity of native labour was acute; the average number in the service of the company during the year being 1,223, as against 1,340 in 1910 (a decrease of 117), all underground boys.

The new north reef pinched out 16 feet below the 8th level. The main reef (western section) was intersected in two crosscuts at distances of 202 feet, and 430 feet below the 8th level and driven upon at 590 feet, but in all cases was found to be unpayable. The general development on both the main reef leader and south reef has disclosed values which are highly satisfactory.

Under section 18, Natal Mines Act, 1899, the following prospecting claims will be abandoned and open to be repegged on 5th April, 1912, unless the exemption licences be renewed and a fine at the rate of £1 per claim and other moneys due be paid:—Reg. No. of Claim, 1385 to 1388 and 1411 and 1412; name of holder, Shepstone, Wylie, and Binns (in trust), class of claim, metal; locality, near junction Buffalo and Umgeni Rivers, Umsinga Division.

Zaaiplaats Tin: Official Statements.

Owing to the market rumours regarding the position of the Zaaiplaats mine, the directors of the company have deemed it advisable to publish for the information of shareholders the following telegram received from the mine manager last Monday:—"No. 13 pipe is showing an improvement in development. In section No. 6 west the ore body is dipping steep and widening out, and is rich. No. 6 east is also improving in grade and commencing to dip again. The other section of the mine is satisfactory. The mill produced five tons of concentrates in the last 24 hours. Everything is running smoothly here. Very heavy rains in the Sterk River watershed last night. The river is running high."

Owing to the number of enquiries from shareholders respecting the development at the mine, the directors have decided to publish the following particulars for general information:—In order to estimate the tonnage development at the mine the directors some time ago made arrangements to have the ore reserves surveyed and assayed as far as is possible, and the mine manager has had this work in hand. This is nearing completion, and the results will shortly be published. Instructions are being given to the mine manager to furnish a quarterly report on the mine development in future which report will be published for the information of shareholders.

LITERATURE FOR
MINING CAMPS.
MINE READING ROOMS should send direct to London for their Literary Books and Periodicals, or for Technical Books for individual use. List of Rates of Subscription for 1,500 Periodicals; also complete Book Catalogue of 180 pp. post free.
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THE WEEK IN THE SHAREMARKET.

A Miniature Boom—Improvement All Along the Line—Big Buying for London—Bears Caught Napping.

For once the optimists have proved right, and a real improvement, amounting to a miniature boom, began this week. A glance at the list will show that with a few exceptions, the rise has been general, and prices have been marked up even where little business has been done. As usual the advance began with the big gilt-edged counters, spreading later to the smaller stocks, and not ignoring the diamond syndicates. Corner House stocks led the van, followed closely by the other houses. African Farms have been largely dealt in on news of the decision to float Leeuwpoort, in which it holds an interest. The arrival of Sir Abe Bailey in London has also had a good effect on them. The satisfactory annual reports issued this week will, no doubt, likewise create a good impression. At the same time, it seems clear the improvement is due to general rather than any special conditions. The labour unrest in England, and the spread of Socialism are naturally turning investors' eyes towards a country and an industry where troubles are not to be feared. Besides, many close observers have seen that some Rand stocks were undervalued at recent prices, and that the market was ripe for a rise. The list below illustrates the changed aspect of affairs.

	*	*	*	*		
	Friday, 8th	Sat., 9th.	Monday, 11th.	Tuesday, 12th.	Wed., 13th.	Thurs. 14th.
African Farms ...	15 0	15 0	15 0B	15 0B	16 6	17 3
Aurora West ...	7 6B	...	...	7 6S	...	7 6B
Apex Mines ...	29 0B	29 0B	30 6S	31 6S	33 6B	39 6
Bantjes Consolidated	24 0B	24 0B	24 3	24 0B	25 0	25 6
Benonis	6 6	6 0	5 9B	6 9	6 9	6 9
Blaauwbosch ...	...	...	...	.	...	13 0S
Bushveld Tins ...	0 9B	0 8B	0 10	1 0	0 11B	1 0
Brakpan Mines ...	56 6S	...	57 0B	58 3B	60 3	61 6B
British S A. ...	26 0B	...	...	27 6B	...	29 6B
City and Suburban ...	49 6B	51 0S	50 0	49 6B	49 3	49 3B
City Deeps	51 6	51 9	51 3	51 9	52 0B	55 0
Cloverfield Mines ...	4 1B	4 0B	4 0B	4 2S	4 3B	5 6
Cons. Langlaagtes ...	19 0B	19 0B	19 6	20 0B	20 3B	22 6
Cons. Main Reefs ...	18 6	18 3	18 3	18 3	18 6	19 0
Clydesdales	...	...	...	10 0B	10 0B	...
Coronation Freeholds	0 10B	0 7B	...	0 6B	0 7B	0 7B
Con. Investment ...	...	...	...	...	22 6B	24 0
Concrete Cons. ...	10 0B	...	...	...	10 0B	...
Crown Mines ...	130 0B	...	130 0B	...	140 0S	140 0B
Cassel Coals	11 6B	...	...	...	...	...
East Rand Cent. ...	8 0S	7 9B	7 6B	7 6S	8 0	8 9
East Rand Coals ...	2 5	2 4B	...	2 6	2 5B	2 5
East Rand Deeps ...	...	2 0S	2 0S	2 0S	1 7B	...
East Rand Props. ...	55 6B	55 0	55 3	55 0	55 0S	60 6
East Rand Deb. ...	£92	£92	£92	£92	£93	£94
Eastern Gold Mines	1 9	1 8B	1 8B	1 8B	1 8B	1 10
Govt. Areas... ...	22 3	22 0B	22 6	22 6B	23 9	25 0
Glencoe (Natal) Colls.	6 5B	...	6 5B	...	6 5B	6 5B
Glynn's Lydenburgs	33 0S	...	...	..	33 0	34 6B
Glencairns	...	...	4 0S	...	...	4 0B
General Minings ...	18 3B	18 3S	19 0B	18 6B	19 3B	21 0B
Hex Rivers	1 0	...	...	...	...	...
Jumpers	10 0B	10 0	12 0S	10 0B	10 0B	11 0B
Jupiters	10 9	—	10 6B	10 6B	10 6B	11 6
Kaalfontein Diamonds	...	0 6B	...	0 8B	0 8B	...
Klerksdorp Props. ...	3 1	3 0B	3 0B	3 1B	3 1B	3 4
Knight Centrals ...	13 6B	13 6B	13 9B	13 9B	14 6	15 9
Knights Deeps ...	50 0B	...	50 0	48 9B	48 9S	48 9B
Kleinfontein Estates	32 6S	...	...	...	32 6S	...
Lace Props.	3 0B	3 0B	3 1B	3 2B	3 2B	3 6
Lydenburg Gold Farm	8 6	8 7	8 7B	8 7B	8 7B	8 9
Main Reef Wests ...	28 0B	28 3B	28 0B	29 0B	29 6B	31 0
Modder B's	52 0B	51 6B	51 6B	52 0B	54 0	55 0B
Midas Deeps ...	1 2S	1 2B	1 2S	1 3	...	1 3B
Middelvlei Estates...	2 0B	2 0B	2 0B	2 0B	2 0S	2 0B
Modder Deeps ...	23 6B	...	23 6B	24 6	24 6S	25 0B
Meyer and Chaltons	80 0B	80 0B	81 6B	80 0B	82 0B	...

B Buyers. S Sellers.

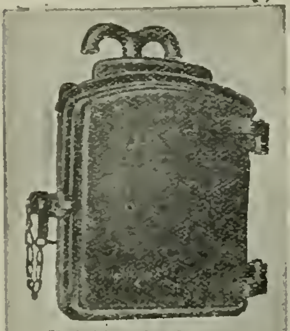
	Friday, 8th	Sat., 9th	Monday, 11th.	Tuesday, 12th	Wed., 13th	Thurs. 14th.
New Eras	6 0	6 0B	5 9B	6 6B	6 10S	7 3B
New Kleinfonteins ...	28 6B	28 6S	28 6	28 6B	29 6B	29 0B
New Rietfonteins ...	11 6B	11 3B	10 0B	11 6S	11 6B	12 3
New Unifieds ...	17 0S	17 0S	19 0S	...	19 0S	18 0B
New Boksburgs ...	1 6B	1 6B	1 6B	1 6B	1 6B	2 3
Nigels	15 0B	...	...	...	...	...
Orange Diamonds ...	1 9B	1 9B	1 9	1 9B	1 9B	2 0
Pretoria Cement Co.	55 6S	55 0S	55 0S	53 0B	55 0S	53 3
Princess	...	...	12 0S	12 0S	11 0B	...
Potchefstroom Est....	1 6B	...	...	...	..	2 0B
Rand Nucleus ...	2 11B	3 0S	2 9B	2 10B	3 0	3 0B
Randfontein Estates	33 3	33 0	32 9B	33 0B	33 0B	33 6S
Rooiberg Minerals .	28 6	28 0B	28 0B	28 6	28 6	29 6
Rand Klip	3 10B	3 9B	3 9B	4 0	4 0S	5 0B
Ryan Nigels ..	4 0S	4 0B	4 0B	4 1B	4 0S	4 1S
Robinson Deeps ...	50 0B	53 6S	50 6S	52 0S	52 9B	54 6B
Rood. Durban Deeps	...	25 0B	25 0B	25 0S	25 0B	27 6S
Rood. U.M.R. ...	20 0	...	...	...	...	—
Simmer Deeps ...	3 6B	3 6B	3 6S	...	4 0B	5 0
South African Lands	4 1B	4 0B	4 4B	4 3B	4 9	5 6
S. Randfontein Deeps	4 3	4 3B	4 3B	4 4	4 4B	4 9B
Sub Nigels	6 0B	...	7 0S	6 0B	7 0S	6 6B
S. A. Breweries ...	38 6S	38 6B	39 0B	39 0B	38 6B	39 0B
Springs Mines ...	8 0B	8 3B	8 3B	8 6S	10 6S	10 6S
Swaziland Tins	...	...	...	...	...	37 6B
Trans. G.M. Estates	42 6B	42 6S	42 6B	41 0B	44 0	45 0
Temple Tins ...	3 0B	3 2S	3 0B	3 3S	2 10B	3 0
Trans. Coal Trusts...	36 9B	37 0B	37 9S	37 6B	39 3B	40 3
Tudors	4 0S	...	...	3 0B	...	...
Van Ryn Deeps ...	7 0B	7 0B	7 3	7 3B	7 6B	8 3S
Village Deeps ...	41 0B	41 0	40 9B	42 0B	43 0B	44 3
Vogel. Cons. Deeps...	1 10S	..	1 10B	1 11	1 10B	2 6S
Witbank Collieries...	42 0	...	...	...	...	..
Wolhuters	22 0B	...	22 3S	22 6S	22 3S	22 3B
Wit. Deeps	47 6B	48 0	...	48 6B	50 0B	52 6B
West Rand Con. ...	7 3B	...	7 6B	...	8 9S	10 6B
Zaaiplaats	54 0	57 0	42 6	48 0	50 0	54 6

B Buyers. S Sellers.

INVESTORS' DIARY.

The following company meetings have been announced :—

March 20.—City Deep; Lancaster West; May Consolidated; Anglo-French Coal Estates.
March 21.—Ferreira G.M.
March 22.—Modder "B"; Vogel Cons. Deep; Knight Central.
March 26.—Cassel Coal Co.
March 27.—Rand Mines; Modder Deep Levels; Princess Estate; Geduld Prop.; S.A. Gold Mines.
March 28.—East Rand Deep.
March 29.—Simmer Deep; Jupiter; Randfontein Deep.
April 12.—Transvaal Consolidated Lands.
April 17.—South Randfontein Deep.
April 25.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep; Cloverfield (Extraordinary General Meetings).
April 30.—New Era; Springs Mines; Brakpan Mines; Transvaal Coal Trust.
May 3.—Cinderella Consolidated; Aurora West.
May 8.—Roberts Victor Diamonds.
May 10.—Ferreira Deep; Ferreira G.M.
May 17.—Wit. Deep; Knight Central; Wolhuter; Treasury Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep (Extraordinary General Meetings).
May 18.—Aurora West.
May 22.—Apex Mines; New Kleinfontein.
May 23.—Benoni Consolidated; Crown Mines.
May 29.—Robinson Gold Mines.
May 30.—Village Deep.
June 4.—Ferreira G.M.
June 5.—Rand Mines.
June 26.—Transvaal Consolidated Lands.
July 19.—Transvaal Consolidated Lands.



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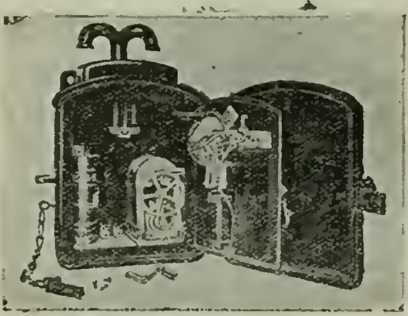

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FACTS & FIGURES.

THE "SISKOL" STOPE-DRILL, TYPE S.A. 65

THE RECORD BREAKER.

HERE ARE SOME OF ITS PERFORMANCES:

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4 "SISKOL" Drills stoped 144·4 fathoms and box holed 6ft. in one month---104 Drill Shifts.

4 "SISKOL" Drills stoped 1,300 fathoms and box holed 30ft. in one year---1,233 Drill Shifts.

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Engineering Notes and News.

World's Record in Tracklaying.

The *Royal Engineers' Journal* records the fact that this record was achieved on the Baro-Kano Railway on the 8th of March last year. The record to be beaten was one of five miles, made by Messrs. Pauling, in Rhodesia. Six and a third miles were laid between 5.50 a.m. and 6.40 p.m.; a further quarter mile had been laid out, but could not be linked up owing to darkness coming on and all the gang being tired out. One thousand six hundred and twenty-two natives were employed and seventeen Europeans. The weight of rails and sleepers handled was over 900 tons. The feat is remarkable evidence of the working powers of the natives when properly led.

The West Rand Electric Hoists.

INTERESTING TECHNICAL DETAILS.

This week we are able to give some further particulars of the electric hoists at the West Rand Consolidated Mines to which reference was made in our last issue. The west shaft of this mine is a seven-compartment shaft, and is being driven downwards at an angle of 50 deg. to the horizontal. Sinking was commenced by means of a temporary headgear and two small steam sinking engines, and at the same time an order was placed for two double-drum electric winding engines, one suitable for a 6-ton useful load and the other for a 3-ton useful load. By the time the electric winding engines were installed the permanent headgear was completed, and the shaft had been sunk to a sufficient depth to permit of economical hoisting with the electric hoists. The permanent headgear is built entirely of steel, and the engine-room is built of brick, and is very commodious. A large space is reserved in the engine-room for a third electric winder, to be installed when the shaft is finished and the mine partly developed. Power for the winding motors is obtained from two motor-generator sets, arranged so that either hoist may be driven by either motor-generator, provision also being made for the third equipment in contemplation. Each motor-generator set comprises a 2,000 volt three-phase 50 period slip-ring induction motor, directly coupled to a direct-current generator and an exciter. The alternating current supply for driving the motors of the motor-generator sets is purchased from the Victoria Falls and Transmission Power Company, Limited. The winding engines were supplied complete and their erection supervised by the British Westinghouse Electric Manufacturing Company, Limited, who purchased such parts as drums, brakes, drum-shafts, and bearings from the Dingler'sche Maschinenfabrik A. G., under the terms of the order. The mechanical equipment of both hoists are almost identical in spite of the difference in the load. The services for which these hoists are designed are:—

		Hoist No. 1.	Hoist No. 2.
Inclination of shaft to horizontal	deg.	50	50
Length of shaft	ft.	3,000	3,000
Hoisting speed	ft. per min.	2,000	2,000
Weight of rock per wind	lb.	12,000	6,000
Weight of skip		7,500	5,500
Weight of rope		8,500	6,000

Each hoist is equipped with two drums, 10ft. in diameter by 3ft. 9in. wide between flanges, running loose on the drum-shaft, and driven by multi-tooth clutches sliding on hexagonal sections of the shaft. The clutches are operated by hand-wheels on the driver's platform. Post brakes are provided on each drum of the segmental type, supported in the centre and applied by weights. Compressed air engines, with "Iversen" valve gear, are used for releasing the brakes. Interlocks are provided so that the brakes cannot be released on a drum that is not clutched to the main shaft. Compressed air for operating the brakes is obtained from a small three-phase 50 period 500 volt squirrel cage induction motor, fitted with automatic starting and stopping gear, controlled by the air pressure. The position of each cage in the shaft is indicated by two dial depth indicators, driven one from each drum through gearing. Each indicator has two points, one moving slowly during the entire travel of the skip, and the other moving very rapidly during the final part of the wind so as to increase the accuracy of stopping. Automatic devices are provided which bring the skips to a dead slow speed at the tip, and stop the hoist dead should the skips pass the tip, irrespective of any action on the part of the driver. The

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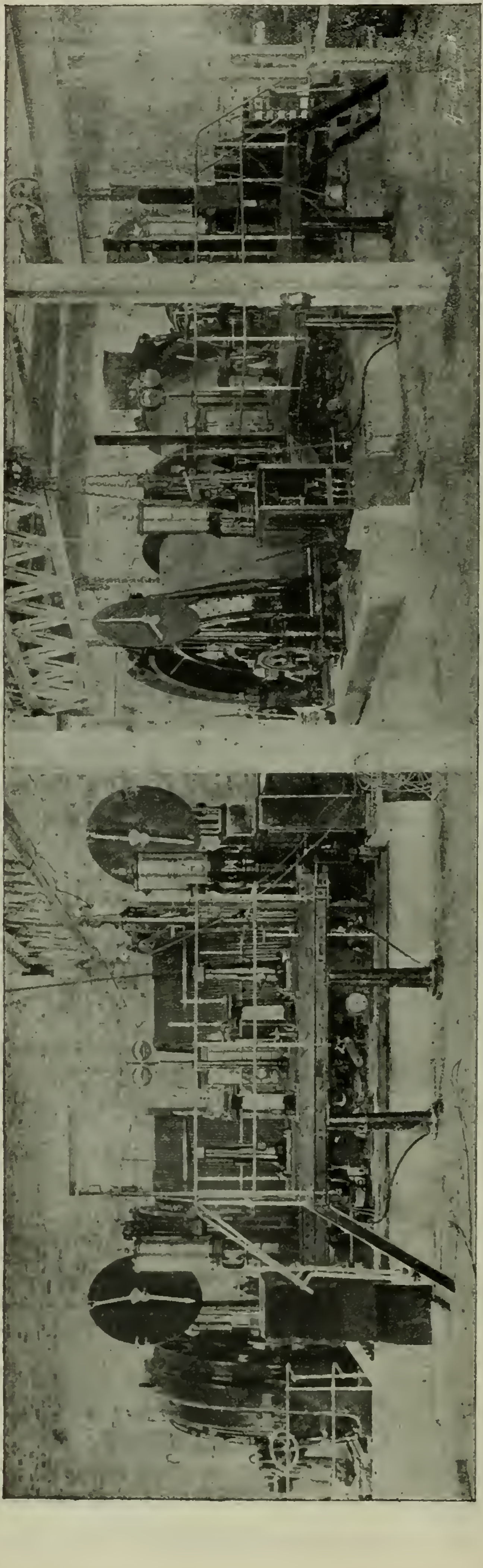

The Electric Hoists at the West Rand Consolidated Mines.

electrical equipment is designed for operation on the now well-known Ward Leonard system. The winding motors are directly coupled to the drum shafts, and in each case operated at 60 revolutions per minute. On hoist No. 1 the motor is an 800 brake horse-power 600 volt direct current motor, provided with commutating poles. Hoist No. 2 is provided with a 480 horse-power direct current Westinghouse motor, together with the drum, driver's platform, and other gear. In the Ward Leonard system the speed and direction of rotation of the winding engine are controlled entirely by altering the strength and direction of the current of the direct current generator in the motor generator set. This is carried out by means of a special face-plate controller. By means of this controller any desired speed may be obtained up to full speed in either direction, the speed corresponding closely to the position of the driver's lever, irrespective of the load. These controllers are fitted with stops, controlled electrically from the bank, so that half speed cannot be exceeded when men are being raised. An emergency device is provided for each hoist, arranged and connected so that the hoists are quickly stopped in case of: (1) Overwinding, (2) failure of power supply, (3) failure of exciting current, (4) overloads, (5) failure of air supply, (6) operation of driver's emergency lever. There is thus a safeguard against practically any danger that may arise. A four-panel switchboard is used for controlling the supply of power to the two winding engines, and is arranged to permit extension when required. The switchboard is equipped with one alternating current and one direct current panel for each hoist, the former for the alternating current motor, and the other for the fields of the various direct current machines. Although the Ward Leonard system my be readily adapted for use with a fly-wheel, so that no peaks are reflected on to the mains, no attempt has been made to equalise the load of these winding engines since the stations of the Victoria Falls and Transmission Power Company are regarded as being large enough to be untroubled even by the heavy peaks of the large winding engines in use on the Rand.

New Patents.

84. Thomas Inman Coppin.—An improved electro-magnetic separator.
85. Rowland Owen Pickin.—Improvements in and relating to rock drills for allaying the dust produced thereby.
86. Heinrich Brawn.—Apparatus for extracting nitrogen and carbonic acid from combustion gases.
87. Clara Haisman.—An improvement in respirators.
88. Wilhelm Mauss.—Improvements in heat engines.
89. Hans Rosenstock von Rhoneck.—An improved method of modelling plastic substances and apparatus therefor.
90. James Millar Neil.—Process of and apparatus for atomising metals, minerals and the like.
91. Charles Henry Augustus and Frederick Lockhart Ross.—Improvements in or relating to fire arms.
92. Denis Francis Breslin.—A detachable cushion for respirators.
93. Lancelot Ussher.—Improvements in purifying air in mines.
94. John Mitchell Lafayette Henry.—Apparatus for distributing material upon dumps.
95. Paul Millington Jerrard.—Improvements in rotary engines pumps and the like and apparatus therefor.
96. Botho Helmuth Lindhorst.—Improvements in apparatus for utilising the force for the development of power.
97. William Henry Davis and George William Teal.—Electrolytic cell.
98. Frederick Kimberley Loewenthal.—A new or improved material or preparation for closing punctures in the inner or inflatable tubes of pneumatic tyres.
99. Leslie Walter Welsford and William Arthur Barton.—An improved apparatus for moulding concrete blocks for building purposes.
101. Francois Pierre Fernand.—An automatic apparatus or machine being an improved method for spraying sand or any other coarse or fine powdered substance into sanitary buckets in water closets.
102. Alfred Adrien Tunmer.—Improved racquet for tennis or the like.
103. William Philpot Curran Bain.—Improvements connected with wire fencing.
104. Frank Robert McBerty.—Improvements in Telephone Exchange systems,

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105. Eduard Zublin.—Improvements in closures for exit orifice of silos and the like.
106. Alfred Louis Thorne.—An attachment for rock drills to absorb the dust created by drilling operations.
107. William James Barnett, Oswald Victor Whittle, and Fred. Morgan Linscott.—Improvement in means for igniting blasting fuse.
108. James Anderson.—Automatic gravitating rolling roller crusher.
109. Louis Clague Partington.—Improvements in or relating to automatic signalling on electric tramways.
110. Harry Ernest Waters and John Russell Cawthorne.—Improvements in ore feeders.
111. Fabrian Mercer Cox.—An improved caisson and air lock for the recovery of precious stones and minerals from deep waters.
112. Gustavus Adolphus Sheeley.—Improvements in elastic or resilient wheels.
113. John Hart.—Improvements in acetylene lamps.
114. Thomas Dawson.—Improved process for extracting the moisture from green wood and for speedily and efficiently drying and compressing same for manufacturing purposes.
115. James S. Colbath and Wilbur Alson Hendryx.—Improvements in ore classifiers.
116. Morris Columbus White and Otho Cromwell Duryea.—Improvements in or relating to apparatus for heating compressed fluid for operating pneumatic or other mechanism.
117. Jonas Marcus Kylling.—An improved process and apparatus which is worked by hand for separating gold and other nuggets or diamonds from rubble earth or sand, and retaining same.
118. Harry Percy Hudd, Frans Heinrich Michelsen and Edmund William Hudd.—A new and an improved solution for preventing pneumatic tyres deflating when punctured.
119. Frederick James Belneman.—Traction engine drive wheel.
120. James Anrest Hrosfield.—Improvement in tube mill feeders.
121. Harcourt Ommundsen, Edward James Dunn Newitt, and Sidney Robert Hollick.—Improvements in or relating to the sighting of small arms and ordnance.
122. Rose Basch, and Samuel Basch.—Improvements in and relating to elastic tyres for the wheels of vehicles.

The South African Railways accepted the following tenders :—

Bookbinding (System "A") for three years, commencing February 1, 1912 : Mr. R. Scott, Capetown.

Braamfontein Breakdown Train Shed—Structural Steelwork for : Messrs. Gilbert, Hamer and Co., Ltd., Johannesburg, structural steelwork at £235 (delivered f.o.r. Congella Wharf).

Scrap wrought iron and steel, 5,300 tons of 2,000 lbs : Mr. Isaac Ochberg, Capetown—wrought iron and steel scrap at Port Elizabeth, 2,000 tons at 27s. 6d., £2,750 ; East London, 1,000 tons at 29s. 9d., £1,487 10s. ; Durban, 1,300 tons at 31s. 6d., £2,047 10s. ; total, £6,285.

Rails and fastenings, 50 miles of 60lb. section : The Bethlehem Steel Co., 50 miles of 60lb. section, rails, high carbon open hearth, 4,708 tons at £6 1s., £28,483 8s. ; fishplates, high carbon open hearth, 300 tons at £7 13s. 6d., £2,302 10s. ; chairplates, high carbon open hearth, 714 tons at £6 9s. 6d., £4,623 3s. (delivered c.i.f. East London) ; total, £35,409 1s.

Siemert Road Bridge—removal of old and construction of new bridge, etc. : Mr. P. Jorissen, £2,022 13s. 2d.

Koelenhof, erection of stationmaster's quarters : Mr. R. Pender, Woodstock, £425.

Teak logs and planks : Mr. Jac. Loopyut, Capetown : Teak logs, Moulmien or Rangoon, 48,500 cub. ft. at 9s. 4.8 per cub. ft., £22,795 ; teak planks, Moulmein or Rangoon, 19,000 cub. ft. at 9s. 4.8d. per cub. ft., £8,930 ; total, £31,725 (delivered ci.f. Capetown, Algoa Bay, East London, and Durban).

E.R.P.M.: General Manager's Advice.

Mr. Anderson, in responding to a toast at a dinner given by the electrical staff of the E.R.P.M. a few days ago, said that the property had been a good deal in the limelight of late, and they now wanted a little peace and quietness in order that they could go along happily and comfortably. It had been rumoured that violent changes were impending, but he did not want to make any violent changes. He had found just as good men there as anywhere else, and as long as they put their shoulders to the wheel and worked loyally they could rest assured of their employment on the property. He hated a shirker, however, and shirkers were the only men who need be apprehensive. He strongly advised the employees not to pay any attention to rumours, which only made them feel miserable. If a man felt anxious as the result of a rumour, let him go to the fountain head in order to ascertain whether it was true or not. Referring to the existence of cliques on mining properties, he expressed the hope that while he was connected with the E.R.P.M. there would be none, but that, on the contrary, harmony would exist all round.

Pigg's Peak Development Co.

We have received the following from the general manager :—During February the Pigg's Peak Development Company's mill ran 26 days, crushing 2,458 tons. Fine gold recovered from mills 803 ounces. Sands and slimes treated 2,516 tons ; yield from sands and slimes in fine gold, 409 ounces. Total fine gold, 1,212 ounces ; total value, £5,095. Working costs, £2,012 ; profit, £3,084. Working expenses, including development, 16s. 4d. per ton. During the past month 409 tons of the ore from the new section mine were crushed.

Rietkuil Gold Mines.

Mr. W. H. Dawe presided last week over the fifteenth ordinary general meeting of the Rietkuil Gold Mines, Ltd. The Chairman said : In moving the adoption of the directors' report and the accounts for the year which ended on December 31 last, I have to draw your attention to the fact that work was suspended on the company's property in April last, and that the amount of the loan incurred in this connection stood, with accrued interest, at £26,514 15s 8d. at December 31, 1911. An irrevocable power of attorney to bond the company's property has been granted to the parties concerned as security for this loan, and any further funds that may be advanced by them for the upkeep of the property and sundry general expenses. The agreement under which those interested in this loan were given the right to reconstruct the company on terms that were approved of at an extraordinary general meeting of shareholders which was held on May 4, 1910, has expired, but it is possible that you may be asked to grant an extension of the option, in which case you will be called together to consider the question. I now beg to formally move the adoption of the reports and accounts as submitted. The motion having been adopted, Messrs. W. H. Dawe, C. S. Goldmann, M.P., F. R. Lynch, J. H. Ryan and A. G. Gill were re-elected directors, whilst Messrs. F. W. Diamond and A. Aiken were reappointed auditors.

The Johannesburg Municipality has accepted the tender of Messrs. Reunert and Lenz for the supply, erection and delivery of a Belliss and Morcom Turbine and Condensing Plant, with a 3,000 k.w. 2-phase "Siemens" Alternator for the sum of £13,651, including spares.

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To Stop Dumping.

In the course of its inquiries, the Industries Commission went into the question of dumping, which it describes as "a distinctly unfair form of competition." The Commission recommends the adoption of drastic measures to put an end to the practice, and proposes that the Canadian and Australian precedents be followed. In this connection it is interesting to note that simultaneously with the publication of the report, there is published in the *Gazette* a Bill to "provide for the management of the Customs of the Union of South Africa," which very largely takes over the Commission's recommendations. The Bill proposes that a special duty (or dumping duty) be leviable on dumped goods, equal to the difference between the selling price of the article for export and its current value for home consumption in the country of purchase; and further, that, in the case of bounty-fed goods, an additional duty shall be leviable equal to the amount of the bounty.

* * * *

Durban Combine.

For some time past there has been a great outcry about the the price of condensed milk in Durban, and an attempt has been made to boycott those brands which are in the combine. There is in Durban, to a very large extent, a gigantic trust in all matters of foodstuffs, and an effort is being made to break it down, especially by the railwaymen, who have formed a co-operative association. It is hoped that Major Silburn's Bill will help to break this trust, which has brought the cost of living in Durban up to the same rate as that of the Rand, except as regards house rent, and considerable interest is being taken in the Bill which Major Silburn has drafted as follows:—"Notwithstanding anything to the contrary in any law in force in the Union, or in any Province thereof, it shall not be lawful for any person, from and after the passing of this Act, to give, offer, or promise, whether acting as principal or agent, to any other person, any rebate, refund, discount or reward upon condition that such other person shall purchase or otherwise obtain, or in consideration of such other person having purchased or otherwise obtained goods, wares, or merchandise, from any particular person to the exclusion of any other persons. Any person contravening the provisions of this Act shall be guilty of an offence, and liable on conviction to a fine not exceeding £50, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months, or to both such fine and imprisonment."

* * * *

National Bank: Annual Meeting.

The annual meeting of the National Bank of South Africa was held last week, the Hon. H. Crawford presiding. The report showed a profit for the year of £168,808 2s. 5d. A dividend of six per cent. absorbs £66,000, the reserve fund £50,000, the pension fund £5,000, the purchase account of the National Bank, O.F.S., £20,000, and the balance is £27.808 2s. 5d. The chairman, in presenting the report, said, *inter alia*, that the balance sheet for 1911 reflected a further expression of business. He invited their attention to notes in circulation which were now £521,424. as against £458.473 in 1910. Deposits stood at £10,437,000, against £10,135,000 in 1910, an increase of £302,000. It might be mentioned that fixed deposits maturing over a period of twelve months represented 40 per cent. of the total liabilities to the public. Drafts issued on branches and agents outstanding at date were now £211,000, as compared with £229,000 in 1910. Bills for collection showed an increase of £269,218. Liquid assets, comprising cash and money at call in London, investments, and bills of exchange, amounted to £5,345,400, or nearly 48 per cent. of the liabilities. Bills of exchange amounted to £1,417,449, against £1,240,074 last year. "Bank premises" stood at £402,388, against £405,094 in 1910. Bills discounted, loans, etc., reflected an increase of fully one million over last year's figures. On account of the greater expansion of the farming industry, assisted by co-operative societies, and the natural growth of business, the demand for money in South Africa has been good, and they had been able to employ their funds more fully and profitably than in former years. Continuing, the chairman said: "It is usual for me to make a few remarks regarding the general conditions under which we have worked during the year under review, and turning naturally to South Africa in the first place, I am pleased to say that circumstances have been favourable. The days of living on the fruits of speculation seem to be rapidly passing away, and there is no longer with us any appreciable section of the community whose livelihood is dependent on gambling on the Stock Exchange. In the earlier times there was a continual influx of capital from Europe for company and syndicate formation, and without perhaps seriously realising it many in those days existed on this capital and not on intrinsic revenue. The cessation of this supply of capital spelt for some very considerable period great depression, which, though trying at the time, may, I think, be now regarded in the light of a blessing in disguise, as it has tended to eliminate the speculative element and to compel the community to develop its legitimate resources. Consequently share market fluctuations, while always regrettable, no longer affect the earning power of the general public to the degree they did in our earlier history, and business is as a result more normal, and less subject to the sharp vicissitudes characteristic of the past."

* * * *

The Census.

In this week's *Union Gazette* is a general and comparative summary of the population of the Union, and of each Province of South Africa, according to the census taken on May 7 last year, compared with the population of the Colonies comprising the Union according to the census taken on April 17, 1904. All races are included. They cover European or white, and other than European or white:—The Union: 1911, total 5,973,394 (3,069,392 males, 2,904,002 females); 1904, total 5,175,824 (2,682,235 males, 2,493,589 females); increases, total 797,570 (387,157 males, 410.413 females) Cape of Good Hope: 1911, total 2,564,965 (1,255,671 males, 1,309,294 females); 1904, total 2,409,804 (1,218,940 males, 1,190,864 females); increases, total 155,161 (36,731 males, 118,430 females). Natal: 1911, total 1,194,043 (564,648 males, 629,395 females); 1904, total 1,108,754 (550,631 males, 528,123 females); increases, total 85,289 (14,017 males, 71,272 females). Transvaal: 1911, total 1,686,212 (971,555 males, 714,657 females); 1904, total 1,269,951 (702,569 males, 567,382 females); increases, total 416,261 (268,986 males, 147,275 females). Orange Free State: 1911, total 528,174 (277,518 males. 250,656 females); 1904, total 387,315 (210,095 males, 177,220 females); increases, total 140,859 (67,423 males, 73,436 females).

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Rand Provident. The report of the Rand Provident Building Society and Savings Bank for the half-year to December 31 last shows that during the period under review the new business done by the society has been above the average of previous years, and the balance sheet shows a satisfactory state of affairs. During the period the sum of £34,920 has been lent on property, the greater part of this amount being advanced on new buildings. The total amount secured by bonds held by the society is now £128,188, on 313 different properties. The share capital on December 31 stood at £69,007. During the six months £22,741 has been paid out for shares matured and withdrawn, and a sum of £18,410 has been received for subscriptions. The number of new shares issued is 406. The sum to credit of depositors' accounts is £92,224, of which £39,498 is on fixed deposit. The number of accounts is now 1,350. Interest credited to depositors for the six months amounts to £1,724. Deposits received amount to £31,818, and withdrawals £33,285. The cash reserve is £12,812. The balance to credit of profit and loss account is £5,615, being £1,667 carried forward from June 30 last and £3,948 the net profit for the half-year. Although loans are now granted at a reduced rate of interest, the profit for the half-year shows an increase of £484 as compared with the same period of last year.

* * * *

Stamp Duties. A deputation representing the United Municipal Associations of South Africa, which waited upon the Prime Minister and Minister of Finance last Tuesday with regard to the question of the Stamp Duties and Fees Act of 1911, in so far as that Act affected municipalities, made the following representations: (1) That municipal stocks should be exempted from payment of stamp duty of a shilling per £100 on transfers prescribed by Item 16 of the schedule to Stamp Duties and Fees Act of 1911. It was pointed out that at the time when the stocks were issued it was represented by the Municipalities that no stamp duty on transfer of stocks would be payable, and that, in consequence of this representation, the burden of duty would have to be borne by the Municipalities. (2) It was also urged that brokers' notes in respect of small sales on municipal markets should be exempted from stamp duty under Item 10. (3) It was also urged that the stamp duty prescribed under Item 11 should not apply to certificates issued by municipalities; (4) The last point raised was that the Government should assume responsibility for the payment of municipal rates on those Government properties which were not used by the State for public purposes. The Minister of Finance replied to the deputation on behalf of the Government, and stated with regard to item (1) that the Government were considering the question of bringing in an amended Stamp Bill during the present session (if possible), and that in view of the fact that stamp duties on transfers of municipal stock fall upon municipalities and not on the transferees, the Government would, in an amended Bill, exempt municipalities in respect of stock issued prior to the passing of the law. With regard to item (2), he intended in amending the law to exempt small sales on municipal markets from stamp duty on brokers' notes. As to item (3), the Government were willing to exempt certificates issued by municipalities in the ordinary course of their business from stamp duty. With regard to item (4), the Government was at present considering the question of imposing liability on the State for certain classes of Crown property which was not used for public purposes, and legislation on the lines (more or less) of the Cape Acts, Nos. 36 of 1891 and 19 of 1892, would probably be introduced.

* * * *

Dr. Macdonald, the enthusiastic expert on dry farming, gave an address to the Vryburg Farmers' Association the other day. This was the peroration: "And so standing here at the 'Gateway of the Golden West' I see the vast potentialities of your dry lands, for this Durum wheat is destined to build up your country as the famous wheat, called number 1 hard, of Manitoba, has built up the Canadian North-West as the navel orange has built up California, and as the merino sheep has built up the Commonwealth of Australia."

New Registrations.

The following new companies, decreases and increases of company share capital and notices of liquidation of companies have been registered at the Registrar of Companies' Office, Pretoria, during February, 1912 :—

NEW COMPANIES.

Consolidated City Properties, Ltd., Central House, corner of Main and Simmonds Streets, Johannesburg; registered February 1, 1912; capital, £100,000.
Fabian, Ltd., 17 and 18 New Court Buildings, Market Street, Johannesburg; registered February 5, 1912; capital, £25.
The Universal Stores, Ltd., 48 Railway Street, Germiston; registered February 7, 1912; capital, £500
Autogrip, Ltd., 19 Bok Street, Johannesburg; registered February 7, 1912; capital, £2,000.
The Economic Investors Trust Co., Ltd., 10, Marais Court, Commissioner Street, Johannesburg; registered February 8, 1912; capital, £50
Rand Collection and Estates, Ltd., 18 and 19 Natal Bank Buildings, Market Street, Johannesburg; registered February 13, 1912; capital, £250.
United Produce Agency, Ltd., 11 and 12 Henwood's Arcade, Loveday Street, Johannesburg; registered February 13, 1912; capital, £1,000.
Hannebohn and Rieder, Ltd., 6 Simmonds Street, Johannesburg; registered February 14, 1912; capital, £3,500.
Newtown Buildings, Ltd., 8 Grosvenor Chambers, Loveday Street, Johannesburg; registered February 16, 1912; capital, £200.
Rand Steam Matzos Factory, Ltd., Stand 449 Maxwell Street, Heronmere Township, Johannesburg; registered February 19, 1912: capital, £2,000.
The New De Deur Estate, Ltd., Trust Buildings, corner of Fox and Loveday Streets, Johannesburg; registered February 20, 1912: capital, £1,750.
Silcock and Versepul, Ltd., Sussex House, 26 Rissik Street, Johannesburg; registered February 28, 1912; capital, £5,000.
Stein Bros., Ltd., corner of Dunbar and Raymond Streets, Bellevue (Stand No. 215), Johannesburg; registered February 28, 1912; capital, £3,000.
Kinemacolor (South Africa), Ltd., 17 and 18 Royal Chambers Simmonds Street, Johannesburg; registered February 29, 1912; capital, £15,000.
Sonia, Ltd., 5 Primrose Buildings, Fraser Street, Johannesburg; registered February 29, 1912; capital, £100.
Johannesburg Motor Mart, Ltd., 104-106 Marshall Street, Johannesburg; registered February 29, 1912; capital, £8,000.

FOREIGN COMPANIES.

Reinhardt Diamonds, Ltd., care of H. J. Macrae, Royal Chambers, Simmonds Street; Johannesburg; registered February 7, 1912; capital, £1,250.
Gilbert Hamer and Co., Ltd., care of Bellamy and Lambie, 622 Consolidated Buildings, Johannesburg; registered February 7, 1912; capital, £20,000.
Transvaal and Rhodesian Estates, Ltd., care of H. A. de Beer, Sauer's Buildings, Loveday and Market Streets, Johannesburg; registered February 13, 1912; capital, £1,000,000.
Mooifontein West Diamond Syndicate, Ltd., care of J. S. Richardson, 2 and 3 Transvaal Bank Buildings, Johannesburg; registered February 15, 1912; capital, £8,500.
The Diamantfontein Development Syndicate, Ltd., care of G. McBean, B. and T. Buildings, 68 Commissioner Street, Johannesburg; registered February 15, 1912; capital, £20,000.
The Mooifontein East Diamonds, Ltd., care of L. J. Sheffield, 15 Simmonds Street, Johannesburg; registered February 22, 1912; capital, £16,000.

INCREASE AND DECREASE OF CAPITAL.

Reserve Investment Co., Ltd., Johannesburg; registered February 13, 1912; capital decreased from £200,000 to £170,000.
New Rand, Ltd., Johannesburg; registered February 22, 1912; capital increased from £130,205 to £131,195.
Wonder Mine, Ltd., Johannesburg; registered February 28, 1912; capital increased from £7,000 to £10,000.

NOTICES IN LIQUIDATION.

Pretoria Palace of Varieties, Ltd., Pretoria; voluntary.
A. V. Rosettenstem Syndicate, Ltd., Johannesburg; voluntary.
Draaikraal Syndicate, Ltd., Johannesburg; voluntary.
Doornkom Tin Syndicate, Ltd., Johannesburg; voluntary.
De Hoogeveld Drukkers Maatschappij, Bpkt., Ermelo; voluntary.
The Colmar Block, Ltd., Johannesburg; voluntary.
New Districts Development Co., Ltd., Johannesburg; voluntary.
Regina Diamond Syndicate, Ltd., Johannesburg, voluntary.

Contracts Open.

The Secretary of the Tender Board, S.A.R., Johannesburg, invites tenders for Seven Earthworks and Masonry contracts in approximate lengths of two miles, and three or more contracts for Breaking Ballast on the Mooi River—Estcourt Deviation (April 2); for the erection of Two Detached Houses in Esselen and Kapteijn Streets, at the corner of Quartz Street, Hillbrow, Johannesburg (Mar. 19); for the supply of Hardwood Logs (Mar. 19); Rhodesian Teak (Mar. 26).

The Chairman of the Tender Board, Provincial Secretary's Office, Market Street, Pretoria, invites tenders for the erection of a bridge over the Klein Yokeskei River, Boschkop, District Pretoria (Mar. 29); also for additions to Bezuidenhout Valley School, Johannesburg (Mar. 29).

The District Engineer, Public Works Department, New Museum Buildings, Pretoria, invites tenders for the remodelling of drainage of the Bryntirion Estate, Pretoria (Mar. 22).

The Chairman of the Tender Board, Provincial Secretary's Office, Bloemfontein, invites tenders for the erection of a bridge of two spans of 40 feet each, and one span of 100 feet, concrete abutments and piers, over the Groot Vet River, District Winburg, Orange Free State (March 18).

The Provincial Secretary, Bloemfontein, invites tenders for the supply from time to time, as required, of Woodwork Tools and Cookery Utensils in connection with the equipment of a number of Woodwork and Cookery Schoolrooms in the Orange Free State (Mar. 30).

The Secretary to the Tender Board, S.A.R. Offices, Johannesburg, invites tenders for the Earthworks, Masonry and Concrete (in four contracts) on the Winterton—Bergville Railway (Mar. 20).

The Secretary, Krugersdorp Hospital, invites tenders for the supply of the following articles for the period 1st April, 1912, to March 31st, 1913, to be delivered as required at the Hospital: Groceries and Provisions, Meat and Poultry, Coal, Milk, Bread, Drugs, Fish and Ice, Mineral Waters, Laundry (Mar. 25).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the erection of Police Post at Mooifontein (Diamond Diggings), Bloemhof, Western Transvaal (Mar. 20).

The Town Clerk of Johannesburg invites tenders for the erection of Fencing and Gates at Auckland Park Square (Mar. 27); for the erection and completion of Cottage at the High Service Reservoir, Yeoville (Mar. 29); for the supply of Tramway Rails, Tram Car Tyres (May 10).

The Chairman of the Tender Board, Provincial Secretary's Office, Market Street, Pretoria, invites tenders for the erection of Teachers' Quarters, at Zendelingsfontein No. 88 School, Wolmaransstad District, Transvaal (Mar. 22).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of Oilskin Capes and Mackintosh Overall Leggings to the Department of Posts and Telegraphs during the period 1st July, 1912, to 31st March, 1915. The approximate annual requirements are 500 black oilskin capes and 500 black mackintosh overall leggings (June 5).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the erection of Union Bridge over the Umzimkulu River, between the Provinces of Natal and the Cape of Good Hope (March 20); also for additions to cow byres, bull boxes, piggeries, and erection of new reinforced concrete silo at the experimental farm, Potchefstroom (March 20); also for printing and supplying the Union and Cape Provincial estimates of revenue and expenditure for a period of three years, from 1st of July, 1912, to the 30th of June, 1915 (March 20); also for conversion of late Rand High Court Buildings into a Central Police Barracks, at Johannesburg (March 20); also for supply and erection of two electric passenger lifts for new law courts, Capetown (April 24).

The Provincial Secretary, Wale Street, Capetown, invites tenders for the erection of a Bridge of one Span of 100 feet over the Tyumie River, Alice, Victoria East Division, Cape Province (Mar. 22).

The Chairman of the Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of Hats (or Helmets) and Caps to the Department of Posts and Telegraphs (May 29).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for printing and publishing the *Official Gazette of the Province of the Orange Free State* and printing and supplying Ordinances for that Province for a period of two years. The nature of the work necessitates its performance in Bloemfontein (Mar. 20).

The Chairman of the Tender Board, Attorney-General's Office, Pietermaritzburg, invites tenders for the undermentioned service:—Renewal of superstructure, Deepdale Bridge, Umkomaas River, Natal (Mar. 26).

The Provincial Secretary, Wale Street, Capetown, invites tenders for the erection of a bridge of two spans of 100 feet each over the Groote River at Steytlerville, Cape Province (Mar. 27).

The Chairman of the Road Board, Magistrate, Potchefstroom, invites tenders for the making and repairing of roads (Mar. 25).

The Secretary to the Tender Board, S.A.R. Offices, Johannesburg, invites tenders for the earthworks and concrete of a section of half-a-mile in length, alongside the Olifants River, at a point of 28½ miles beyond Graafwater. The earthworks comprise the excavation of some 33,500 c. yards from two cuttings, and of approximately 96,000 c. yards to be obtained from borrow pits. The concrete is that required for the construction of a 10ft. arch culvert containing approximately 1,000 c. yards (Mar. 28); also for the building of the bridge over the Olifants River, consisting of 11 spans of 60ft., with steel superstructures, piers, and abutments of reinforced concrete carried on reinforced concrete piles (April 11).

Companies in Liquidation.

Mutual House and Land Association, Ltd.; second and final liquidation account will lie for inspection at the Master's Office, Pretoria, from February 23rd to March 11th.

Regina Diamond Syndicate, Ltd.; a meeting of creditors will be held at No. 64. New Stock Exchange Buildings, Fox Street, Johannesburg, on March 5th.

Hansen and Schrader, Ltd. (voluntary), February 19th; Viggo Hansen, liquidator.

Gold Fountain Syndicate, Ltd.; a final meeting will be held in the Board Room, Trust Buildings, Johannesburg, on April 2nd; Raymond des Clayes, liquidator.

Union Diamond Mines, Ltd.; the list of calls upon contributories will lie for inspection at the Master's Office, Pretoria, from February 23rd for fourteen days. Alexander Rodger, liquidator.

Barberton Far East Gold Mining Syndicate, Ltd.; a further meeting will be held at the R.M.'s office, Barberton, on March 5th. Jas. Dyce, liquidator.

Regina Diamond Syndicate, Ltd. (voluntary), February 16th; Ernst Friedlander, Andrew Machie Niven, Carl van Beek, John Townley Williams, and Ernest Mansfield, liquidators.

All Red, Limited (voluntary), February 8th.

Main Reef Exploration Syndicate, Ltd., a meeting of creditors will be held in the office of the Nourse Rainier, Ltd., 86, Johannesburg Stock Exchange Buildings, on February 27th. J. H. Rainier, liquidator.

New Districts Development Co., Ltd., The (voluntary), February 13th; a meeting of creditors will be held in the Board Room, Second Floor, City House, Harrison Street, Johannesburg, on February 29th. H. Williams, liquidator.

Rhenosterfontein Prospecting Syndicate, Ltd.; a first and final distribution at the rate of 17s. 6½d. per share will be paid on and after February 16th, at the office of the liquidator, H. Williams, City House, Harrison Street, Johannesburg.

Barberton Far East Gold Mining Syndicate, Ltd.; the list of contributories will lie for inspection at the Master's Office, Pretoria, for 21 days from February 20th. Jas. S. Dyce, liquidator.

Myers, W., Ltd.; a general meeting will be held at 94, Standard Bank Chambers, Commissioner Street, Johannesburg, on March 23rd. M. Myers and J. Arenstein, joint liquidators.

King George Gold Mining Co., Ltd. (voluntary), January 29th. John S. Aspeling, liquidator.

Hoogeveld Drukkers Maatschappij Beperkt (voluntary). February 12th.

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Automobile Notes.

Expansion in Motor Car Trade.

In a circular letter addressed to the British motor car manufacturers from the Board of Trade office, London, in regard to the trade in motor cars in South Africa, the report of His Majesty's Trade Commissioner for South Africa (Mr. R. Southern Holland) is embodied thus:—"On previous occasions I have attempted to bring to the notice of manufacturers the expansion that has taken place in South Africa in the motor car trade. The growth is exemplified by the figures published by the Customs Statistical Bureau from time to time. For example, in 1909 the total imports of motor cars and parts was £174,811. in 1910 the imports rose to £290,441, an increase of over £115,000 during the year. This increase has continued during 1911. The figures for the first six months show the imports of motor cars and parts at £170,266. It is difficult to furnish manufacturers with particulars as to the class of car mostly used in the several districts of the country, but Johannesburg being the principal market, I have endeavoured to obtain information showing the distribution of the trade between British firms, and foreign firms, in respect of that market. I now enclose for your information a return that has been prepared for this office by the municipal authorities of Johannesburg, covering the cars licensed between the period 1st January to 29th September, 1911. The total number of cars for private use is 744, while cars for hire amount to 72. The comparative figures for 1910 were 582 and 66, showing a considerable increase in respect of the cars for private use. The list I now forward includes the name of maker, the horsepower, and the number of cars under each denomination of horse-power. I am unable to give the country of manufacture in every case, as certain makes are not known to myself, or to the trade in Capetown; but so far as can be ascertained the number of British cars amounts to 296. while those imported from foreign countries number 433, the balance, 15, is made up of cars, the names of makers of which are unknown. The figures given above, and extracted from enclosed return, show an unsatisfactory condition of things as far as British interests are concerned. Of the foreign makes the following are those most favoured:—Adler 74, Buick 45, De Dion 47, Ford 41, Renault 48. Of the cars for hire there are 26 British, as against 46 foreign, the principal foreign car being the Darracq, which numbers 24. As far as motor cabs are concerned it should be noted that Capetown has now between 60 and 70 motor cabs on the rank; motor cabs are also being employed in other towns in South Africa." The report also deals with the fast developing trade in motor bicycles within the Union. The circular concludes with the request that manufacturers will be informed of the position, pointed out, and they in turn are invited to communicate with the office for any further particulars they may desire. All communications on the subject should be addressed direct to H. M. Trade Commissioner, Capetown, and copies of catalogues and price lists might also be forwarded for filing in the Bureau of Commercial Information, established by Mr. Holland, at Capetown. The statement, as submitted, on request by the municipal authorities, Johannesburg, by the way, furnishes the names of over 100 different types of cars as registered in the Johannesburg municipal area, and in a review of the list it is patent that the numbers of foreign cars considerably exceed those of British makes, but no explanation for this fact is attempted. Since the compilation of the list,

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however, large numbers of British cars have been introduced to Johannesburg, and even many new makes are being imported, and finding a generous market here. The American car in the past has undoubtedly commanded a ready sale in Johannesburg, the time of its introduction, at a fair figure, synchronising with a time when the effects of depression greatly influenced the market in its favour. This fact, it may be said, more than any other, to a large extent is responsible for the numbers of American machines placed locally. Continental manufacturers, speaking generally, having many years ago recognised the possibilities of the motor vehicle, entered the field, so to speak, earlier than their British competitors, and consequently continental cars found their way in large numbers to foreign countries, as the returns under discussion earlier clearly illustrate, being the case in South Africa. The British car, however, is destined in the future to occupy a position which, by way of emphasis, may be termed unassailable, and as previously mentioned this is all the more certain now, owing to the fact that British manufacturers have seriously turned their attention to Colonial requirements. The demands, within the shores of the United Kingdom, for the home-manufactured car, in many lines, has become so pronounced, as to exceed the supply in the past, but the immense progress of the industry throughout the Kingdom has rendered expansion of a huge nature imperative, making possible a much larger output, the surplus of which is being eagerly absorbed by oversea patrons. It will be found that the influx of British cars to South Africa will be very marked within the next few years, with such satisfaction to the users, as to for ever dissipate or make possible any view maintaining that the British car is occupying an inferior position in point of prestige in this country.

A T.A.C. Function.

A club house dinner, followed by a smoking concert, was arranged for last evening at 7.45, at the Grand National Hotel, to do honour to Mr. A. R. Atkey, the club's official representative on the R.A.C. The name of the guest of the evening has become quite a household word in automobile circles, and Mr. Atkey needs little introduction to the motorist community; his keenness in all matters affecting the motorist being widely recognised and appreciated. The club circularised its members in point of making the affair a success, and it is hardly necessary to add that functions of this nature are conducive in a very material way to the promotion of good feeling among the various traders and others, which trade rivalry, etc., may at times injure to a more or less degree.

Petrol Risks.

Considering the very grave risks involved in the storage of petrol and other highly inflammable fluids, the garage proprietors and individual motorists, the actual fires recorded are fortunately very slight. Still the danger is an ever-present one, and in the interests of motorists especially, reference is here made to an apparatus, termed the "Rectus," which has a very special claim to being an ideal extinguisher of an incipient fire. An absence of complications makes this simple hand arrangement workable without previous experience. No liquid is employed, a dry chemical substance, in the form of a powder, acting like a charm, when thrown from the apparatus on a fire. Local experiments have proved all that is claimed for the Rectus fire extinguisher, the results being absolutely reliable and effective, and in addition to being cheaper than most other extinguishers on the market, should prove of immense value to those with whom precautionary measures in regard to fire are a first consideration. Outbreaks of fire are not by any means confined to the motor house, many serious fires occurring owing to faulty petrol pipes, which sooner or later start to leak. Unions are often a source of much danger in this respect, and should be periodically inspected, and the slightest leak attended to. Insecure joints are also fruitful of much mischief, working adrift from road vibration, and are to be avoided, as such have been responsible for much damage; in fact, disastrous results to cars have accrued through this cause. Taps, in many cars, are often fitted in most inaccessible positions, that in the event of a fire occurring it is well-nigh impossible to shut off the petrol. Fires also originate in the carburetter, but as a rule, are not always serious, however, the danger resultant from petrol escaping from a carburetter can be minimised by attending to all cavities where the spirit may lodge. If the leak, on the other hand, cannot be stopped, and has become ignited with the grease and oil in the undershield, the precaution of carrying a small chemical fire extinguisher, such as that earlier referred to, will, as a rule, prove immediately effective, when brought into requisition.

Selukwe G.M. Co.

A circular has been issued to the shareholders stating that under the tributing agreement 50 ft. of bona fide new development work has to be completed monthly to the satisfaction of the company's engineer, and the company has also the right, under stipulated conditions, to terminate the agreement. The tributing lease was signed on October 19, and shareholders were so informed through the Press. A report by Mr. A. H. Ackermann on the tributors' operations states that on the 6th level main reef drive from the main shaft a spur reef going off into the footwall was found. About 15ft. of driving has been undertaken, the highest panning obtained being 5 dwts., the majority of samples panning traces. This new discovery was opened up on the 7th level; for the first 10 ft. it panned 7 dwts. over 18 to 24 ins., the recent samples taken showing only traces. It may, therefore, be said that this development has met with negative results.

New Rhodesian Companies.

TORONTO (RHODESIA) SYNDICATE.

Registered February 16. Capital. £50,000 in 5s. shares. Object to acquire the mining claims in Rhodesia, known as Toronto, Lucknow, Winchester, Globe and Palmyra, all registered in the mining office of the British South Africa Company, to acquire shares in the Dwarf Gold Mining Company, Limited, and the St. Ives (Banket) Exploration Company, Limited, to adopt an agreement with the Marlo (Rhodesia) Syndicate, Limited, and to carry on the business of miners, prospectors, explorers, metallurgists, etc. Minimum cash subscription. 120,000 shares. Registered office: 522 Salisbury House, London Wall, E.C.

KEFFI TIN COMPANY.

Registered February 16. Capital, £50,000 in 5s. shares. Object: To carry on the business of tin and general miners, prospectors, explorers, metallurgists, dealers in metals and minerals, etc., in Africa or elsewhere, and to adopt an agreement with the Rhodesian Gold Explorers, Limited. Minimum cash subscription, seven shares. The first directors (to number not less than two nor more than five) are Sir William Wallace, K.C.M.G., St. Annes, Fleet, Hants; M. H. de la Poer Beresford, 15 Comeragh Road, West Kensington; and C. Wallington, 4 Tokenhouse Buildings, E.C. Registered office: 62 London Wall, E.C

The following letter appears in the issue of the "Farmer's Weekly" for the 6th inst: —"Sir,—I see in your paper a lot of correspondence on the labour question. Undoubtedly, the mines are taking all the labour from the farmers, and what is going to be the end of it I cannot say, but the problem is very simply solved if the Government will only approach all the mines and enter into an agreement with them something to this effect:—Let the mines agree to import their own labour, Chinese or any other kind, and bind themselves not to employ any Bechuanas, Basutos, or any other local natives. This will then allow the farmer plenty of local labour and thus both industries will be served. Another great danger which the authorities do not seem to see is that hundreds of local native women are flocking to the mines, not to work for their families, but mostly to make beer and run brothels.—I am, etc.

ALF. W. READER.

Daddy's Luck,
Marico, February 24th, 1912.

Our Twenty-First Anniversary Number.

THE LAST WORD ON RAND MINING.

To commemorate the twenty-first anniversary of the founding of this journal, a special number, distinct from the ordinary weekly issue, will be published at the end of next June. Fittingly to mark the occasion, the number will contain a comprehensive and concise account of the past history, achievements and present position of every gold mine on the Rand, illustrated and brought down to the latest possible date. It will review the industry generally as well as in its several technical aspects, and will include articles by experts on the chemical, mining and metallurgical progress and problems of the fields. A feature will be made of the personal side of the industry, and a section will be devoted to its technical and administrative leaders, enriched with portraits and other illustrations. Engineering on the Rand in all its phases, electricity, steam and air power will be treated, and the growth and progress of electric power supply will be exhaustively discussed. The gold mines of the outside districts and the tin, copper and coal industries of those districts will be dealt with thoroughly and at first hand. The great diamond industry of South Africa will have a section to itself, and here, as in the treatment of the base metal industries, the letterpress will be embellished with many striking and original illustrations. Mining in the Cape, Natal and Orange Free State Provinces will also be reviewed and the undoubtedly great mineral potentialities of those, as yet undeveloped, areas will be graphically set forth. German South-West Africa will find a place in the issue and a first-hand account of the diamonds, the copper and the tin mines of that promising field will be included. Moreover, the banks and other great financial institutions, the railways and harbours of the sub-continent will be adequately dealt with, and the whole problem of transportation as it affects the inland industrial centres will be reviewed. In this connection Capetown, Port Elizabeth, Durban, East London, Delagoa Bay and Beira will be separately and fully treated and their claims examined. Apart from mining, there will be a considerable section devoted to a description of the several subsidiary industries dependent on mining for a market. Chief among these will be cement, explosives, soap and candle-making, milling and the hundred and one activities that centre in the Rand. Rhodesia and Mozambique will be given a separate and extended treatment. The different mines will be described and illustrated, and the recent progress of the industry in those territories dealt with comprehensively and lucidly. In addition, the issue will contain a number of interesting and valuable contributions from leading men in the mining and financial world, many of whom have already sent their congratulations on the decision to issue a special commemorative number of the journal. Numerous letters received from past Rand engineers and mine managers, now resident in all parts of the world, contain offer of contributions. These will form a unique collection of valuable views and reminiscences, and will considerably enhance the interest of the volume. The work will consist of upwards of 350 pages, printed throughout on art paper. Prizes are offered to artists for the best design of a suitable and striking character, and particulars are given in another part of this issue of other valuable prizes to be awarded in connection with the number. It may be added that the work will be prepared, produced and printed in South Africa, and will aim to cover the whole field of mining in this country, and to prove a fitting monument to the great industry with which, from the beginning, the *South African Mining Journal* has been associated. The co-operation of everyone interested in the industry is being enlisted to make the venture a success, and already it promises to mark an advance on anything of its kind ever before attempted in South African illustrated journalism.

The following tenders have been accepted for the various services mentioned, viz. :—

Jefferson, Ltd., Marlborough House, Johannesburg, £365; repairs to Magistrate's Court, Government Square, Johannesburg.

G. McLauchlan, Box 4206, Johannesburg, £640; repairs to General Post Office, Johannesburg.

A. Creighton, 73, Charles Street, Bloemfontein, £2,465; erection of isolation hospital and gymnasium, Grey College, Bloemfontein.

Cruickshanks and Co., 10, Stanley Street, Port Elizabeth, £4,848; erection of additional accommodation, New Brighton Location, Port Elizabeth.

H. Bryan, Brandfort, £637; erection of school at Virginia, Orange Free State.

A. Creighton, 73, Charles Street, Bloemfontein, £1,650; erection of new ward and single rooms, Lunatic Asylum, Bloemfontein.

J. L. Mauritzen, Vryheid, £947 17s.; erection of gaolers' quarters at Vryheid.

Jefferson, Ltd., Marlborough House, Johannesburg, £410 10s.; repairs to Marshall Square police offices, Johannesburg.

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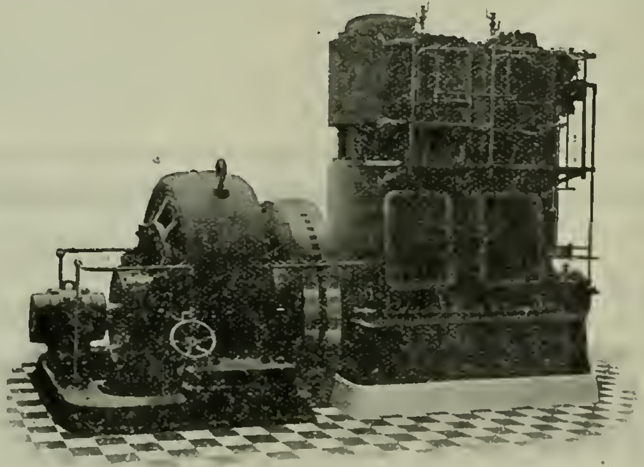

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Notes and News.

Leeuwpoort.

Although no official information is available with regard to the flotation of the farm Leeuwpoort, it is understood that a much smaller scheme is proposed than has been anticipated by the public, a sort of development company, in fact. Details, which will be awaited with interest, will be made known to shareholders at the meeting of the African Farms, Ltd., on Tuesday next.

* * * *

Appingendam.

The option held by the Bay Tree Syndicate on the ground upon which the principal discoveries are located has been renewed for a period, and prospecting operations will probably be continued at an early date. Mr. Bishop, one of the directors from England, is at present in this country.

* * * *

Champ d'Or.

The solicitors of the new syndicate owning the Champ d'Or have written to the Press denying the rumour that because no output was declared for the last two months the mine was worked out. They state that the London Syndicate acquired the property recently under the best technical advice. The management is satisfied with its earnings, and that the established dividends will be forthcoming for many years to come. The syndicate's Johannesburg representative is Mr. J. F. Ferguson, of Sauer's Buildings. " Worked out " is a term that has proved unfounded in the case of the Jumpers and other properties. The purchase of the property by Mr. J. F. Ferguson's syndicate was, of course, duly chronicled in our columns some months ago when it occurred.

* * * *

Underground Reform.

A valued correspondent writes:—" I should like to bring to your notice a point which at present is hardly fully realised, and that is the gradual change in the personnel of the underground staffs on the mines of the Rand. As you are well aware, the mine captains and shift bosses, who are coming in to-day on the Rand, are of a different class and type to the old-fashioned practical—entirely practical—men. For this reason the status of the underground staffs is improving and gaining the important position that is required, in order that future economies may be effected in that department, where all the spade work is done and where even at present too much rule of thumb work is put in, and therefore where we still have much scope for improvements. Underground work on this field must be standardised as much as possible."

* * * *

" The Mining Manual."

The issue of " The Mining Manual " for 1912 has reached us. It is apparent at a glance that Mr. Skinner's well-known work is as complete, as detailed, and as invaluable as ever. The 1912 edition covers the whole field of joint stock mining enterprise, and from its painstaking treatment of South African companies we may gauge the thoroughness of the sections dealing with other fields. The 1912 edition should be at the elbow of every shareholder and mining man. The work can be seen and obtained at the offices of the *Transvaal Leader* and *Cape Times*.

* * * *

Labour at the Nigel.

The Nigel is in the fortunate position of having more native labour than it requires. At the recent meeting of the company the chairman mentioned that, although in the early months of last year the property had not enough natives, the boys came in in such numbers that by the end of October " we found ourselves with more than we could economically work, and although every effort has been made to regulate the supply, yet we find that there are about

2,160 boys on the mine, or about 200 more than we require.'' It was explained that, as the natives could not be transferred to another mine without their consent, the management did not care to interfere, and put the boys to useful work, though the result was an increase in the working costs. The Nigel, it was remarked, has a good name in the kraals, and it was not thought advisable to disappoint the natives who had come up to work on it by attempting to send them to another property.

* * * *

The Tariff.

In the House of Assembly this week Colonel Leuchars, Minister of Commerce and Industries, read his promised statement as to the Government's intentions with regard to the question of the tariff. He affirmed that the recommendations of the Commerce and Industries Commission must receive every consideration, pointing out that the questions raised affected preferential railway rates and excise, and that the difficulty of dealing with the whole problem at present was emphasised by the desirability that whatever tariff was adopted should as far as possible have the element of permanence. He also intimated that the fact that the railway revenue would cease to be available for general purposes within two years was another point to be considered, as they did not desire to have to alter the tariff again then. The abolition of preferential rates should be at a time when it could be co-ordinated with the alteration of the tariff. In view of these considerations Ministers thought it would be most unwise to attempt any alteration of the tariff this session.

* * * *

Big Mills and Working Expenses.

There appears in the *Financial News* of February 24 an article headed "Expenses after Fusion exceed Previous Charges." The article covers many points which have on previous occasions received considerable ventilation in the columns of the *S.A. Mining Journal*. It condemns the crushing of ore taken from anywhere, no matter what its value, in order that the full mill may be kept running, and remarks: "There is good reason to think that views on the Rand in connection with the running of big mills are undergoing a kind of modification." Few of us who have personal knowledge of the Reef and its vagaries will not boldly assert that the Witwatersrand's larger mines are undergoing a good deal more than a "kind of modification." A spirit of effective reform is abroad, and at probably no other time in its history has there been a greater manifestation of reform and amendment than at the present. We are in complete accord with the *Financial News* in the main cardinal points preached in the crusade against "any old thing" being good enough for a large mill. But our esteemed contemporary seeks to prove too much when it publishes a table which sets forth that the Nourse Mines, with 260 stamps, had expenses of 22s. 9d. per ton in January last; the Knights Deep, with 270 stamps, recorded a running expenditure of 12s. 2d.; the Geldenhuis Deep, where 420 stamps were dropping, had costs of 25s., etc. The statistical parable is explained in the sentence, "some of the milling installations above 250 heads cost considerably more to operate than batteries with 100 stamps less." It is true that the *Financial News* elsewhere states, "to compare the working expenses of one amalgamated company with those of another on the Rand would be unfair," and having admitted this great truth it is a pity our contemporary did not abide by it. Although the Rand is the most uniform and concentrated gold field of the world, the essential points of difference between even adjacent mines are so great that only a close and intimate acquaintanceship with their variations will enable one properly to appreciate the general futility of close contrasts.

* * * *

Rand Mines Power Supply Co.

Little or no reference is made in the annual report of the Rand Mines Power Supply Co. to the difficulties which, notoriously, beset its operations during last year. The balance sheet, however, has appended the following significant statement, inserted, no doubt, at the wish of the auditors:—"There is an amount to be paid under Clause 5 of Rand Mines, Ltd., letter dated 11th September, 1909, in respect of interest and amortisation on electrical driven compressors. There are liabilities in connection with the erection of the plant, etc., at Rosherville and Vereeniging Stations unascertained at date. In the agreement of 16th February, 1910, with the Victoria Falls and Transvaal Power Company, Ltd., provision is made for further capital funds to carry out the objects of this company."

* * * *

Messina Plans.

Mr. A. M. Grenfell at meetings of Camp Bird, Ltd., has laid it down that he hoped to see the company one of the strongest finance and mining companies in London. Following out this policy the directors have seized the opportunity of acquiring a substantial interest in the Messina (Transvaal) Development Company, Ltd., and the Camp Bird has agreed to guarantee the interest for five years on an issue of £250,000 6 per cent. debenture stock in the Messina Company. The debenture stock will be issued at 95 per cent., and every subscriber who receives an allotment of the debenture stock now offered will, upon paying up his stock in full, receive an option certificate entitling him to subscribe at any time before March 1, 1915, for one share in the capital of the Messina Company at 22s. 6d. per share in respect of each £2 of debenture stock allotted to him. The shares taken under the said option will rank *pari passu* with the ordinary shares of the Messina Company for all dividends declared after the date when such shares are paid for. The debenture stock is offered to the debenture stockholders and the preference and ordinary shareholders in the Camp Bird, Ltd. The object of the issue is to furnish the Messina Company with additional working capital to further develop and equip the mine, to enlarge the present mill to a capacity of 120,000 tons per annum, and to establish smelting works, hitherto postponed owing to the lack of adequate transport facilities.

* * * *

Gold Reserves.

It has been decided that in the future the Chamber of Mines shall, in the published output, declare the amount of gold carried to reserve in addition to the actual output declared by each company, in order to ensure conformity with the declarations of the Government. Commenting on this at the meeting of the Chamber on Thursday, Mr. J. G. Hamilton entered a plea for abolishing gold reserves altogether. "It seems to me," he said, "that, under these circumstances, it would be well for the companies to again consider whether any useful purpose is served by retaining any reserve at all, seeing that as much publicity has to be given to the reserve as to the declared output. I think that any useful purpose which might have been served by a reserve is done away with by its publication, and that it might be better for shareholders to recognise at once the fluctuations which necessarily occur in the monthly results of mining, and do away altogether with the reserve of gold."

* * * *

Simmer Deep.

The annual report of the Simmer Deep has been issued. The working profit from the year's operations amounted to £56,783 19s. 9d., while the revenue from interest, rents, sales of stands, etc., amounted to £12,700 11s. 8d., making a total of £69,484 11s. 5d. Debenture interest, profit tax and other charges amounted to £60,281 9s. 10d., so that the net profit for the year was £9,203 1s. 7d., which, added to the balance brought forward from last year, makes the balance to the credit of the working expenditure and revenue account at December 31, £53,838 7s. 2d. A re-estimation of the ore reserves showed that there were fully developed at the end of the year some 1,312,000 tons of payable milling ore of a value of 4.9 dwts., made up of 49 per cent. of main reef valued at 5.0 dwts., 20 per cent. of main reef leader, valued at 4.9 dwts., and 31 per cent. of south reef, valued at 4.8 dwts. Of this ore 84 per cent. is valued at 4.64 dwts., and the remainder at about 6 dwts. In addition there are some 263,000 tons of partially developed ore of an indicated grade of 4.8 dwts. The development disclosures were discouraging in the eastern section, but a slight improvement has to be recorded in the western section of the property approaching to the Jupiter mine. More of the development work than formerly is being extended westwards from the west (Milner) shaft to exploit this large area, in the hope of securing an increase in the payable tonnage exposed per foot of development advanced. Although the development footage was reduced by over 26 per cent., the ore reserves are 57,000 tons in excess of the previous year.

* * * *

The Jupiter.

The annual meeting of the Jupiter will be held next week. The working profits for the year amounted to £26,938 4s., and interest and dividends to £6,801 9s. 11d., making a total of £33,739 13s. 11d. The net profit for the year was £31,951 11s. 2d., and the amount at credit of the development account at December 31 £127,370 11s. 4d. The reserve of payable fully-developed ore is estimated at 1,089,000 milling tons of an average assay value of 5·74 dwts., and there are some 245,000 tons of partially developed ore of an indicated grade of 5·2 dwts. In addition, some 230,000 tons of fully developed ore of a value between 4 and 4·5 dwts. are excluded from the ore reserves until reductions in working costs are effected which will warrant their inclusion. The elimination of this low-grade rock has the effect of raising the value of fully developed ore, as recorded above, 0·3 dwt. per ton. Development disclosures continue to expose satisfactory values in the eastern section, but disappointing values are being met with in the far western section of the mine.

* * * *

The Week's Reports.

With this issue another important batch of Rand annual reports makes its appearance. Of these, that of the City Deep is perhaps first in importance. The consulting engineer's report, coupled with the brief but reassuring statement made by Mr. Schumacher at the meeting, clears the air and puts shareholders in possession of all the essential facts regarding the position of the mine. The Ferreira, though it cannot, and, indeed, does not attempt to, disguise its approaching dissolution, makes a brave enough show. Lengthy extracts from the reports of important mines of the Albu and Goerz groups also appear in this issue, and we must be content to hold over detailed comment till next week. Owing to restrictions contained in their articles of association, the Goerz companies have been unable to follow the almost general practice of the Rand, and adjourn their meetings. The necessary powers to hold their meetings at a later date are, however, being sought.

* * * *

The Native Labour Position.

The native labour position has shown considerable improvement during the months of January and February. The number of natives employed by members of the Association, including natives in the service of contractors but excluding natives employed by members in the Barberton, Breyten and Rooiberg districts, had increased to 201,375 by the end of January and to 209,031 at the end of February. This figure compares with 207,761 employed at the same period of 1911. Mr. Hamilton dealt in detail with the returns at the Chamber of Mines meeting on Thursday. From his statement it appears that in regard to natives coming from north of 22 degrees south latitude, the months during which these natives are permitted to arrive on the Rand are shortly coming to a close. Up to date during the present recruiting season 11,507 natives from these districts have been allotted to members of the W.N.L.A. 1,958 were awaiting allotment at the close of last month, and approximately 500 are still due to arrive. If the latter all materialise the total number of this class of natives allotted to the various companies during the recruiting period will be 13,965, as compared with 18,577 during the corresponding period of 1910-11. The decrease is attributable partly to certain difficulties that were placed in the way of recruiters in one district, and partly to a more exacting test in the selection of those physically fitted for mining work.

TOPICS OF THE WEEK.

MINING QUESTIONS IN THE ASSEMBLY.

As a prelude to the important business of the week which began yesterday with the Budget, the Assembly has been considering some questions more or less related to mining. Very early in the week the Minister of Railways was asked what the Government was doing to enable the South African collieries to take advantage of the present crisis in the industry. In reply, Mr. Sauer was long-winded and plausible, but, if we are to judge from the reports, scarcely convincing. He seems as incapable as ever of grasping the great advantages to the country to be gained from fostering, by reasonable railway rates and an adequate supply of trucks, the coal export and bunkering trade. Instead, he prefers, apparently, that trains of empty trucks should continue to be hauled coastwards at the expense of the inland consumer, that Transvaal and Natal collieries should drag on an attenuated existence employing a portion of their productive capacity, and that the coal industry should languish under a passive and unsympathetic Government policy. Mr. Sauer cannot pretend he does not know what the coal industry wants, to be saved. Even the precious report of the Government's own Commerce and Industries Commission has not failed to see and support the case for modification of the State's attitude to the struggling industry, and Colonel Dalrymple on Wednesday, at the Anglo-French Coal Estates meeting, for the hundredth time reiterated its list of grievances. In the meanwhile, we may console ourselves with the reflection that its wilful restriction by the Government keeps its competition for native labour down to a minimum.

Plainly, the old Cape Parliamentary hands are not satisfied with the agreement entered into by the Government with the new Steel and Iron Company. Sir Edgar Walton and Mr. Merriman see in the concession a virtual monopoly, binding the Government for a period, which period and which monopoly they hold to be irregular and contrary to the public good. Though the Minister of Mines succeeded in proving that nothing lay behind the action of the Government, General Smuts studied discretion by referring the matter to a Select Committee. The Government will no doubt shield itself behind Mr. F. W. Harbord's recommendations, though we should not be surprised if the Select Committee find that the advice of a metallurgical expert, however distinguished and disinterested, is not to be followed literally and with impunity into the rare and punctilious atmosphere of Parliamentary procedure.

The Irrigation Bill was made the pretext for dragging in a discussion of the Rand water question. The nebulous grievances of the farmers in the Klip River Valley were paraded by Mr. Geldenhuis; and a lurid picture was drawn of the wicked Rand that absorbed the bulk of the dolomite supply, to the direct loss and discomfiture of the "downtrodden landowners." Sir Percy Fitzpatrick, in characteristic fashion, ruthlessly exposed the sham. He showed that the water supply of the Valley had been acquired by agreement, the sufferers all being compensated. The newcomers attracted to the Valley owing to its proximity to the Johannesburg market for their produce, were hardly entitled to further compensation. They came in with a full knowledge of the facts; they could not pretend to have suffered any wrong. And so that bogey was laid. On Wednesday the eternal white labour question again came up for debate. Mr. Duncan, Mr. Jagger, and Mr. Sampson for the reformers, Sir David Harris and Mr. F. D. P. Chaplin for the industries chiefly affected, carried on the discussion and succeeded in protracting it into another sitting on the 27th. The sentiments of the white labourites are excellent, if illogical, but they have not yet succeeded in convincing those politicians who are also business men, that their crude and destructive theories can spell aught but ruin to the chief industry of the country. An eleventh hour discussion on phthisis gave the Labourites an opportunity to score cheaply and air their unquestioned vituperative ability. All these questions, however, were but a preliminary to the great business of the week, the Budget, which Mr. Hull introduced yesterday, and which, in view of its unusual importance to the mines and its appearance as we go to press, must be left for analysis to our next issue.

THE FUTURE OF RAND WHITE WAGES.

Commentators on Rand mining who are in the fortunate position of viewing its problems from the restricted standpoint of the shareholder are fond of declaring that the next duty of the controllers of the industry is to reduce working costs by a drastic cutting down of white wages. These arm-chair critics of Rand administrative methods support their recommendations by pointing to the high average rate of wages still ruling on the mines, despite the generally admitted reduction in the cost of living, and by dwelling on the notorious extravagance and fecklessness that characterise the miners' manner of living. From that picture they turn to the contemplation of its companion and corollary, an industry living thoughtlessly on its capital, represented by the payable portions of its reefs, and distributing each year decreasing profits to disillusioned shareholders, deterring the necessary inflow of new capital and lessening the life of the mines. Carried away by this chain of reasoning, which misses or ignores many of the realities of the situation, these copy-book economists advocate a sweeping and immediate cutting of wages as a panacea for all our industrial ills. No one actually in touch with Rand mining at this moment needs to be reminded of the practical difficulties in the way of any such reform. In the first place, wages on the Rand are neither fixed nor uniform, and therefore cannot be reduced by any simple process of levelling down, such as Union Government servants have lately been made familiar with. The different systems of payment in vogue—day's pay and contract, coupled with and complicated by the scarcity of competent miners, due to phthisis—make standardisation and uniform "cutting" almost impracticable. Besides, it has always been the policy of the controllers of the industry to maintain the position and pay of the white worker, and nothing but dire necessity is likely to alter their attitude in that respect. The fact is well brought out in an interesting communication received by us just three years ago from Mr. Ross E. Browne, whose masterly report on the industry is still a classic of its kind. In a footnote to a letter thanking us for some remarks made in reviewing his report, that authority wrote:—"The costs' estimate in my report was 14s., allowing for adequate increase of stamping capacity, while maintaining good wages for the skilled labour. The management is to be congratulated upon the rapid rate of reduction so far. Each additional shilling of reduction grows more difficult, and it will be 'great work' if, in the course of the next few years, the above figure is reached. The figure 12s. 6d., which I understand many are now predicting, is, of course, possible, even probable, in the dim future, when the necessity for a more stringent economy arises—but I imagine this figure will involve a more radical reduction of white wages, which is not desirable so long as it may be avoided." The question is, has the "dim future" with its "necessity for a more stringent economy" yet arisen? The query does not admit of an unqualified or direct answer. Economy is so conditioned by efficiency and by health questions that the reply must involve both these considerations. From the welter of recent discussion on these inter-related questions the fact clearly emerges that the highest economy lies in eradicating, or at any rate minimising, the phthisis evil. From that reform is promised a whole crop of minor improvements, such as a more experienced and competent white labour force, a diminished rate of accidents, and a reduced tendency to the "firing" of men that causes instability of tenure of employment. And from these must follow, as surely as the night the day, an appreciation in the value of the present rate of the miners' earnings, making a reduction tolerable to the men and possible to the mines. With these qualifications and in this manner only, we believe, will the hopes of the shareholder be realised and the profitable life of the Rand prolonged in the best interests of all concerned.

RAND ACCIDENTS, PHTHISIS, AND INSTABILITY OF EMPLOYMENT.

The discussion on accidents, phthisis, and instability of employment on the mines grows more valuable and interesting daily. We have seen how the high accident rate is traceable to the many changes on the mines, and it has been shown how phthisis is accountable for high working costs and incompetence underground. It was left for Mr. R. A. Barry, however, to forge the chain of causation closer, and—if we may change the metaphor—in a brief but thought-compelling paper read last Saturday night, to trace the course of the vicious circle in which these evils operate. He showed that phthisis killed or frightened off the best miners, that the incompetence of those that remained helped to send up the accident rate, and to make for frequent "firings," that the high wages which went to keep up working costs were directly due to the combined effect of phthisis, accidents, and a limited supply of experienced miners. Mr. Barry's opportune paper answers some pertinent questions we were about to put. For instance, the question of too frequent changes of men on the mines has been more puzzling than ever of late. Politically, Dr. Macaulay declared it was suicidal, and he received the public assurance of Sir Lionel Phillips that everything possible would be done to stay the evil. As recently as last week a prominent consulting engineer in our own columns joined in condemning the practice, and in the same issue a mine overseer—a practical man—proved convincingly that a sad disservice was done by it to economy underground. In the face of this general chorus of condemnation coming alike from magnates, consulting engineers, politicians, and men, one was forced to enquire who was the culprit? Who, contrary to the wishes of practically every rank of the mining community, was responsible for the continuance of this anomaly? To Mr. Barry we are now indebted for an answer. Up to a point it is the same answer that we ourselves gave to Dr. Macaulay's strictures when first the matter came up for discussion. Mr. Barry, however, goes "a spadeful deeper" in his examination of the causes at work. He traces the evil, in the last resort, back to phthisis; and it must be said that his diagnosis rings true and carries conviction. Phthisis is at the bottom of the "firing of the fools" just as it is at the bottom of the abnormal accident rate, the anomalous increase in working costs, and most of the ills of the industry. Mr. Barry's paper is printed in this issue, and its cogent reasoning and commonsense arguments compel attention. If anything were needed to stimulate the efforts of Government and the mines to stamp out the evil, this latest demonstration of its startling and all-pervading influence in poisoning every activity of the industry underground should prove invaluable.

RAND PROGRESS AND PROBLEMS IN 1911.

More Points from the Annual Reports—The Electrification Disappointment—Vacuum Filtration Giving Satisfactory Results—Underground Transport and Sand-Filling.

Although unaccompanied by the explanatory comments and more elaborate statements which usually fall from the chair at annual company meetings, the reports, published in advance about this time, of directors, consulting engineers and mine managers are, nevertheless, replete with useful information. The main features of the operations of the past year are prominently referred to, and, as in previous years, it is interesting to observe the salient factors which have tended to influence more strongly than the rest the economic progress of the various companies concerned.

The Electrification Programme.

A couple of years ago much was expected from the electrification of the mines of the Rand, and in full reliance upon the promises and calculations of experts who were responsible for the changes decided upon by the mining houses, directors had calculated to a nicety the saving in working cost per ton which was to be effected as soon, or nearly as soon, as the electric current was switched on at the transformer houses. The best-laid plans of the experts, however, as the best-laid plans of ordinary people—and mice—frequently do, failed in their accomplishment, and in this year's reports we have one board of directors after another lamenting the fact and endeavouring to speak hopefully of the not very distant future. The directors of the Crown Mines, Ltd., for example, anticipated that the Rand Mines Power Supply Co., Ltd., would be able to supply the company's full requirements of electricity and compressed air by about May last. " The supply of power commenced in March last, but, for various reasons, the Power Company has as yet been unable to meet the full requirements of the company, and this has necessitated the running of steam plant in order to make up the deficiency. Arrangements are now being made by the Power Company to increase its plant, and it is expected that a full supply of power will be available about the end of 1912." As Mr. Warriner points out, the delay " has resulted in exceptionally high cost of power, and until the entire plant is electrified very little improvement in power cost can be looked for." Similar statements appear in the reports of the Rose Deep, Geldenhuis Deep, Robinson, Durban and Roodepoort Deep, and we shall doubtless have more of the same kind in many of the reports which are still to come.

Metallurgy.

The continued success of the Butters' vacuum filter process wherever the plant has been installed is a matter for gratification. At the Robinson the plant which was commenced towards the end of 1910, was completed and put to work last year, and the residues from these works have only averaged about 0·2 since its installation, and that with a greatly increased percentage of the mill product treated as slimes. At the Bantjes Consolidated, also, the filter plant was completed and put to work last year, about July, and has been giving most satisfactory results, the average slimes residues for the last five months of the year giving the low figure of 0·12 dwt. " The actual extraction lately," adds Mr. Cazalet, the consulting engineer, " has also been improved considerably and is now much better than the year's average would indicate." At the Crown Mines the vacuum filter plant is being extended.

Machine Drills for Stoping.

As was to be expected the increase in the use of machine drills for stoping purposes in consequence of the shortage of native labour, has been sufficiently marked to deserve special mention in annual reports. At the Rose Deep, we learn, small machines of various types were tried for stoping, but generally better results were obtained from large machines. " Hammer drills," says Mr. Walton, the manager, " have been used for drilling down holes, and have given excellent results; the number in use will be increased." At the Crown Mines an extensive use of small machines in stoping has been made, and at the Bantjes a more extensive use of them is apparently in contemplation. It is interesting to find that at the Village Deep, where close mining is the policy in vogue, the use of machine drills has not proved an obstacle to the carrying out of this excellent programme. " The higher mine grade," remarks the manager, Mr. J. Whitehouse, " is partly due to closer mining and decreased stoping widths, which have become possible through the extended use of small rock drills, of which there are now 110 in use; the efficiency obtained by these drills has been on the whole quite satisfactory. Of the total tonnage broken for the year 89 per cent. was broken by machine drills, both large and small."

Underground Transport.

The question of underground transport has received attention in the reports, also, and at the Rose Deep, we learn, " a long endless rope haulage has been installed on the 7th level, connecting Nos. 3 and 4 shafts, which has improved the tramming efficiency on that portion of the mine. There are also 17 small main rope haulages at work in the stopes, which have saved a number of boys." Work on the main haulage drive at the 13th level of the Crown Mines is briefly recorded by Mr. Warriner, who says that in the drive " which is 15 feet wide by 9 feet high, the footage accomplished during the year was 6,683 feet, bringing the total length of this drive at the end of the year to 8,751 feet. The actual driving work is practically complete from No. 1 shaft to a point 579 feet west of No. 7 shaft, thus connecting the underground workings of all sections of the mine." This magnificent undertaking, now considerably over a mile and a half in length, will, when completed, be one of the underground sights of the Rand. In addition to the space for a double track it comprises a barricaded way for travelling in which there is a concrete drain of capacious dimensions and room overhead for air pipes, electric wires, etc. Along this road which will eventually be more than two miles in length, the whole traffic of the great mine will be concentrated and distributed between the two main shafts. At the Durban Roodepoort Deep a scheme of centralization has been adopted with regard to the transport of ore and gravitation of water along the plane of the 12th level to the No. 1 shaft, leaving the No. 2 shaft largely to the handling of tools and men only. Ore will be conveyed along the main haulage level by mechanical or animal traction. At the Geldenhuis Deep such devices as using ponies for tramming rock and mechanical appliances for transport of rock in stopes have been introduced wherever practicable. The same process of concentration and centralization has been in progress at the Village Deep, where, by the completion of a main haulage road on the 16th level, the ore on the lower levels of the Village Deep section will be handled with more economy and despatch, combined with a saving in labour. At the bottom of the No. 3 shaft, by the way, a 2,000 tons ore bin with Kimberley chutes has been made; pumping plant for the whole of the mine is now located at this point, and a main incline shaft to serve the deeper workings is making good progress.

Sand-Filling.

The process of sand-filling has been carried on with unabated vigour, particularly at the Robinson, where the total quantity of sand sent into the old stopes during the year amounted to 132,641 tons. It is anticipated that the current year will record a decided increase over these figures. At the Witwatersrand Deep, during the last eight months of the year, experiments were made with sand-filling in worked-out areas by means of current sand from the cyanide works. Some 34,457 tons of sand were put underground at a total cost of 5·6d. per ton of sand filled, " which," remarks Mr. E. E. Hardach, the manager, " is about the same as it costs to put it on the dump."

REDUCTION RESULTS.

Some Satisfactory Extraction Figures—Albu and Corner House Mines—The Village Deep Makes Good Showing.

From the reports of various companies which have come to hand recently the following figures have been taken. They show that, although many improvements have been made in the process of cyaniding and closer extractions have been obtained, there is still an appreciable quantity of gold which is beyond the economic limit of operation. When the small value of the original material treated is considered, the performance of the average well-equipped cyanide plant is nevertheless distinctly gratifying. Take, as an example of the good work which can be done, the case of the Village Deep, where an extraction of 89·1 per cent. is obtained from originals valued at 2·52 dwts. It is not intended in these notes to institute comparisons between the several plants referred to, because, as everyone knows, the conditions are usually dissimilar to a sufficient degree to make a good deal of difference in the various extraction percentages. With regard to the cost of cyaniding sand and slimes, the amount altogether is between 1s. 3d. and 2s. 6d. per ton treated, the cost at the Meyer and Charlton being 2s. 5·596d. and that at the Village Deep 1s. 3d., the latter figure being additional evidence of the comparative efficiency of the last-named plant. At the New Goch the cost per ton milled, or practically per ton treated, was slightly over 1s. 4d. per ton, and thus runs that of the Village Deep very closely, although the residues were better at the latter. The highest total recovery quoted in the list is that of the Robinson at 96·7 per cent., although the residues are the highest on the list. The high initial value of the ore is sufficient to explain these facts.

	CYANIDING.				Total Milling & Cyaniding Ex'tion per cent.
	Assay Value.		Theoretical Extraction per cent.	Actual Extraction per cent.	
	Originals fine dwts.	Residues fine dwts.			
Rose Deep ...	2·50	0·411	83·6	89·2	95·9
Robinson ...	3·53	0·531	84·9	90·2	96·7
Durban Rood. D.	2·54	0·413	83·8	86·0	95·1
Village Deep ...	2·39	0·309	87·1	89·1	95·9
Geldenhuis Deep	2·52	0·403	84·0	88·6	95·9
Crown Mines ...	2·73	0·403	85·2	87·5	96·0

The figures relating to the mines of the Albu group are not given with the same amount of detail, but the average values for residues per ton milled are given as follows:—

	Sand. fine dwts.	Slimes. fine dwts.	Total Residue. Ave age fine dwts.
New Goch	0·500	0·372	0·456
Meyer and Charlton ...	0·547	0·233	0·464
West Rand Cons. ...	0·417	0·266	0·355
Roodepoort United ...	0·463	0·356	—
Aurora West	0·585	0·212	0·471
Cinderella	0·526	0·310	0·452

From the report of the Knight Central, which has come to hand within the last few days, it is interesting to learn that the total unrecovered value in the residues amounted to 0·28 dwts. per ton milled, a decidedly low figure as compared with any of the preceding results, the lowest of which, that of the Village Deep, was 0·309 fine dwts. The total extraction by mill and cyanide at the Knight Central was 95·2 per cent., which is not at all an exceptional one, as will be seen.

Some Recent Diamond Finds.

At Bloemhof a few days ago the largest diamond yet found on a Transvaal alluvial digging was recovered—this being a stone of 125 carats. Though not a perfect gem, its value is placed at £1,000. Some good finds have recently been made at London, including diamonds of 16, 11, 9 and 7 carats, and many smaller ones, while a nice 25-carat stone was found a few days since at Mooifontein, for which the owner has been offered £450, but wants £500. Modderkraal also joins in the chorus of good finds, including stones of 18¼ and 16½ carats.

Rand Collieries.

During 1911 the revenue from rents, etc., received by the Rand Collieries, amounted to £1,311 8s. 1d.; against this interest on advances figures at £4,556 16s. 7d. General expenses at the mine and head office totalled £11,738 6s. 10d., which amount has been distributed amongst the capital accounts in the following proportions:—Permanent works, £6,450 16s. 9d.; machinery and plant, £5,287 10s. 1d.; total, £11,738 6s. 10d. The financial position shows an excess of liquid assets over current liabilities of £4,133 16s. 10d. On the other hand there is a liability of £108,096 18s. 3d. to the General Mining and Finance Corporation, Ltd., in respect of advances made by that Corporation, and a contingent liability of £1,903 10s. for machinery on order but not yet delivered, etc. The west incline shaft, commencing at the 7th level near No. 1 shaft, and opening up the property above this level, was extended to the 5th level and a self-acting endless rope haulage installed. The east incline shaft, commencing in the vicinity of the west incline shaft and opening up the property below the 7th level, was sunk 652 ft. to a depth of 692 ft., and connected with No. 8 level, a chamber cut and electric hoist installed. A large amount of driving, in all about 11,000 ft. in different parts of the mine, was done during the year, some of which was on the reef and some off the reef on "line." For economic reasons the mine has been developed on a large scale, which has rendered it almost impossible to arrive at a definite valuation and estimate of ore reserves. Only those blocks of payable ground could be included in the ore reserves which were supported by values on every side. The smaller payable blocks were entirely omitted pending further detail development. An estimate of the payable ore thus far exposed shows 261,947 milling tons of a value 7·46 dwts. A similar permanent steel headgear as at No. 1 (north) shaft has been erected at No. 2 (south) shaft and the three and six ton electric hoists at the former shaft, and six ton electric hoist at the latter were put in operation. At the beginning of the year under review the funds at the disposal of the company were exhausted, and the Board arranged with the General Mining and Finance Corporation, Limited, to advance such amounts as were required to complete the equipment then in course of construction and to push development underground. This was done in the hope that at some time during the year it would be possible to place the finances of the company on a sound basis on advantageous terms. The severe financial depression obtaining, however, did not allow of a scheme being brought forward, with the result that at the end of the year the company was indebted to the General Mining and Finance Corporation, Limited, to the extent of about £108,000. In the circumstances the board has decided to confine operations to the sinking of the east incline shaft and to pumping, until such time as definite arrangements can be made for re-financing the company. The property held under mining title is a large one, comprising a gold proposition of some 800 claims, and although exploration work has been in itself considerable, yet only a comparatively small proportion of the property has been opened up so far.

DEVELOPMENT ON THE RAND IN 1911.

How the Mines Have Increased Their Ore Reserves—Adding to the Stock-in-Trade of the Industry—Three Typical Mines Considered.

I.—CROWN MINES, RANDFONTEIN CENTRAL, AND ROSE DEEP.

At this time of the year, when such a large number of annual reports are in the hands of shareholders, some study of the results of development carried out at a few of the Rand's largest and most important mines well repays any trouble involved in collecting statistics. After all, development is the great consideration. The drive of to-day is the stope of to-morrow and the dividend of the day after. This year the big mining houses controlling the destinies of the Main Reef series have made a distinct departure from former procedure in the matter of issuing reports and balance sheets and holding annual meetings. Shareholders now have, and in the future will have, abundant time in which to study the wealth of statistical detail for which the Rand is justly famous.

The Importance of Development.

A great deal in the technical reports issued, it must be confessed, is of no very vital import to the investing public. But, on the other hand, such a vastly important matter as development is set forth clearly and in detail, and we have no doubt but that this year, and in future years, particulars of footage, ore reserves, and values will be examined with a much more critical eye than ever hitherto. And on the whole the critic should not be displeased with the results of his 1911 scrutiny. At some mines the drives, winzes, and raises have disclosed a more satisfactory state of affairs than in the preceding period. Other mines did not reap such a good development harvest in 1911 as in 1910. Similarly, fluctuations in reef widths and values are to be observed. For instance, the Main Reef Leader may have shown up much better, whereas there has been an impoverishment on the South Reef, or the Main Reef may have surpassed expectations and the Main Reef Leader proved a disappointment. After all, these are the fortunes of mining, and the Witwatersrand, despite its fully recognised greater measure of uniformity than is to be observed on any other goldfield, is susceptible to marked variations in reef assays and reef widths.

The Fine Record of the Crown Mines.

We will take, first of all, the Crown Mines as representing the heart of the Central Rand and one of its three largest propositions. The Crown Mines is probably the most important gold mining company in the world, and in view of the ambitious plans laid down for the future, special interest attaches to the particulars given as to development. Last year no less than 71,023 feet were driven, sunk, and risen in the mines of this great consolidation. This represents approximately 13½ miles of development, and without wearying readers with statistical vagaries dear to the heart of Mr. John Holt Schooling, it is worth remarking that the Crown Mines footage for last year is the equivalent of a continuous drive extending from Market Square, Johannesburg, to well beyond Roodepoort Station.

Reef Disclosures.

Of this footage, 42,176, or about 59 per cent. were in reef formation. The greater proportion of this footage was on Main Reef Leader. In all, 18,550 feet were driven on this reef, the average width being 24 inches and the average assay value 17·3 dwts. per ton. In the preceding year 12,205 feet were exposed, the width being 21 inches and the value 19·1 dwts. The value in 1911 was, therefore, less, but the width greater, and on an inch dwt. basis the Crown Mines 1911 development on Main Reef Leader was better than that of 1910. As to South Reef development, last year's figures were 16,807 feet, 21 inches, and 13·6 dwts, the 1910 disclosures being 13,894 feet, 21 inches, and 18·3 dwts. Again applying the inch dwt. basis, we find the development on the South Reef to have been somewhat better in 1910 than during last year. Figures for the low grade Main Reef are as follows:—

	Distance Exposed. Feet.	Width. Inches.	Assay Value. Dwts.
1910	9,876	35	3·5
1911	6,819	38	3·0

The Main Reef development was therefore not quite so satisfactory. To sum up the position, the following instructive table as to ore reserves at the end of 1909, 1910, and 1911 is given:—

	1909.		1910.		1911.	
	Tons.	Dwts.	Tons.	Dwts.	Tons.	Dwts.
Main Reef Leader ...	1,945,157	8·0	2,841,080	8·2	5,165,061	8·0
South Reef	1,971,436	7·3	3,441,639	7·1	4,959,011	6·5
Totals and Averages	3,916,593	7·7	6,282,719	7·6	10,124,072	7·25

It will be seen from the above that the policy of exploiting this vast property and preparing the mine for the greater things which it is destined for has been admirably executed. On the basis of last year's milling the Crown Mines are well over six years ahead of the ore requirements of the batteries and even on the extended basis of milling which has just been initiated the mine is in a remarkably strong and practically unexampled position.

How Randfontein has Fared.

Turning to the West Rand, we find that at Randfontein an even greater footage was achieved last year than in the Crown Mines. No less than 87,541 feet of linear development was carried out, and to continue the elucidation expressed in regard to the Crown Mines the Randfontein footage, if continued eastwards along the line of the reef and around Krugersdorp, would suffice to meet the hypothetical drive of the Crown Mines beyond Roodepoort. In other words, the footage achieved by these two companies last year was the equivalent of a drive extending from Park Station to the Randfontein Mine offices. Anyone who has some knowledge of underground work will appreciate the vast amount of labour, explosives, etc., involved in such a colossal total of work. But this very large footage at Randfontein has not been attended with an increase in ore reserves such as one might have been led to anticipate. The Randfontein reports are presented in different form to those of the Central Mining and other groups, and one cannot investigate the development position so closely in consequence. However, it is stated that the payable ore reserves amounted to 5,658,859 tons of an average assay value of 7·24 dwts., as compared with 5,534,303 tons valued at 7·54 dwts. in the preceding year. There is thus a slight increase in the aggregate of the ore blocked out and a small diminution in value. From a study of Randfontein reports it appears that a very large proportion of the footage is in barren ground. At any rate, with its high angle of reef dip, it is surprising to find that the footage does not materially improve the position with regard to ore in reserve.

Rose Deep Developments.

In the Germiston area the Rose Deep calls for examination. Here 14,324 feet were driven, etc., the larger percentage of the footage being in winzes and raises. Sixty per cent. (8,617) feet was in reef formation. We will here contrast the 1910 and 1911 disclosures to the advantage of the latter year:—

	1910.			1911.		
	Feet.	Value. Dwts.	Ins.	Feet.	Value. Dwts.	Ins.
Main Reef ...	5,434	8·4	29	3,496	8·8	24
Main Reef Leader	3,169	9·3	20	4,079	12·3	17
South Reef ...	2,619	6·5	19	3,187	9·3	20

Particularly gratifying are the values and widths secured on the Main Reef Leader and South Reef, where substantial improvements are shown. The payable ore reserves at the end of 1911 were 3,670,160 tons of an average assay value of 6 dwts. per ton, as contrasted with 3,553,474 tons and 6·1 dwts. at the end of the preceding year. It would appear that there has been a slight increase in the average stoping width.

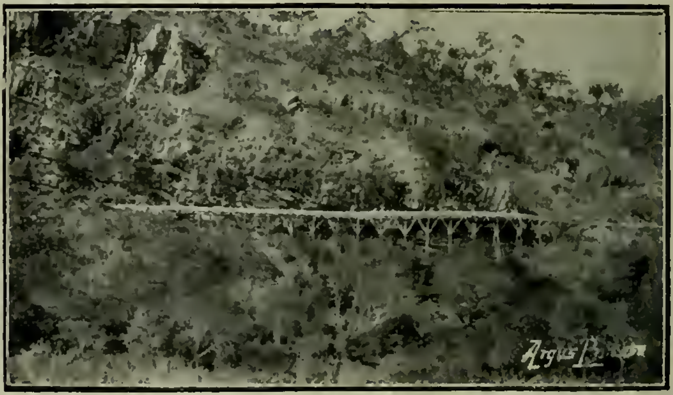
(To be Continued.)

LATEST FROM THE METLEPITSI ALLUVIAL FIELD.

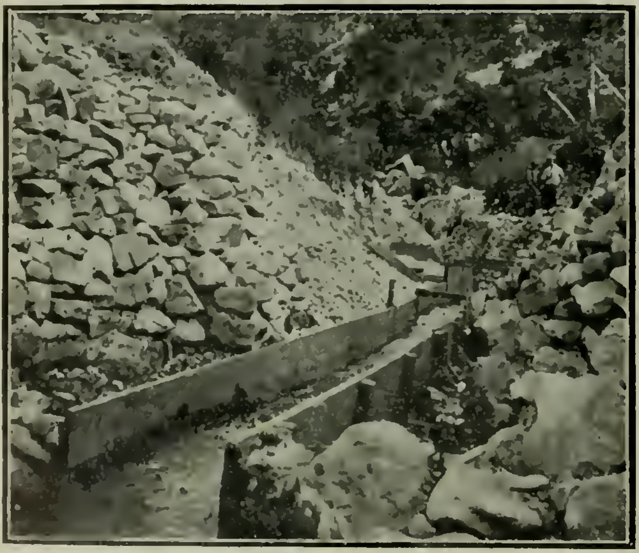
A Sketch of the Work Done—Some Views from the Property—Contemplated Additions to the Plant.

The Metlepitsi alluvial gold property is situated fourteen miles south and east of Haenertsburg. A head-race one and a half miles from intake to pent-head delivers eight cubic feet of water per second, and supplies the monitors at a nozzle pressure of 51 lbs. to the square inch. This pressure proves amply sufficient to break down and wash the gravel to the boxes; these boxes are 160 feet in length, and the gold and heavier particles are caught in them by cocoanut matting, ripples, and blankets. The tail-race, which has been cut a distance of 1,870 feet, at places to a depth of 21 feet through the boulder bed of the river, is designed to carry away the finer soil after it has passed through the boxes, and to drain the main workings. In the past much delay and expense has been caused by a series of heavy floods, and the company has now decided to instal hydraulic elevators, both to prevent these troubles in the future and to increase the treating powers of its plant. The gold is evenly distributed through the alluvium, and although in very fine particles, is easily caught. Washing on a large scale has not yet begun. The capital of the company is £14,000, and the shares are mostly held in England and South Africa. The property extends for thirty miles along the Metlepitsi River. Dr. Robertson is the manager and engineer. The water supply is ample. Labour, however, is not over plentiful, and transport is difficult and expensive. It is not expected that the new elevators will be ready before six months, when the first washing on a large scale will take place. To date some £8,000 has been spent on the property, which it is hoped will redeem the good name of alluvial gold working in the Transvaal.

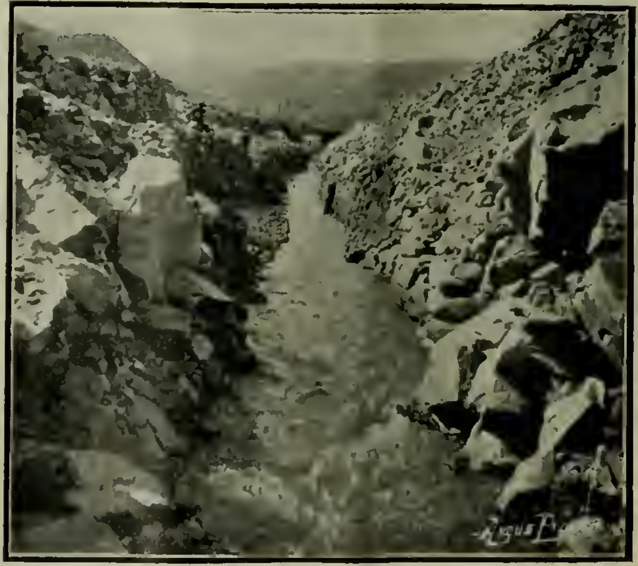
General View of Valley Above Paddock.



River Bed, with Flume 100 Feet Above.



View of the Boxes and Walling.



View of the Tail Race.

Mines of the Witwatersrand.

XIII.—BANTJES CONSOLIDATED MINES, LTD.

Strong Development Position—Large Number of Stope Faces—The Underground Scheme Explained—A Property with an Exceptionally Long Life.

If the index of a mine's worth be its profit, we may state at once that the earnings of the Bantjes Consolidated Mines, Limited, up to this date are quite unrepresentative of its true value. The profit earned last year amounted to £53,936, or 3s. 11d. per ton, which is a decided improvement on the £12,530 recorded in respect of the 1910 operations. Moreover, the profit announced for last month is given at over £6,000, as compared with £5,438 in January and £5,608 in December. It would seem that the mine is in a position to-day, at least, to maintain last month's profit, and it can be remarked without fear of contradiction that in the future the company will be able to distribute a larger dividend than is indicated in the February earning.

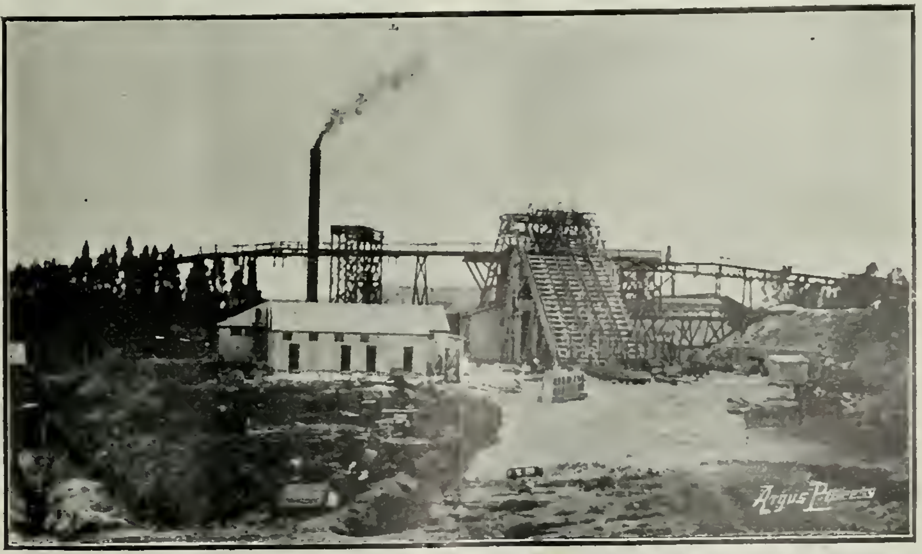
Bantjes Consolidated: A View of the Surface Works.

A Large Mining Area.

Properly to appreciate the situation of this nearer West Rand mine, it may be remarked that the property extends for 7,000 feet along the strike, and that in the extreme southern area of the property, since the reef dips at an average angle of about 35 degrees, the conglomerate beds should be met with at a depth on the incline of 9,000 feet. It is clear, therefore, that the mining area of the Bantjes is immense; on its present crushing basis the mine must have a life so long that it is really futile at this juncture to calculate for how many years it is likely to be productive, provided, of course, present development values are maintained. In order properly to exploit the southern section, it will, no doubt, be necessary at some time to sink a deep level shaft, but that, too, is a thing of the distant future; it is hardly likely that such a course will be contemplated for the next dozen years or so.

The Lay-out of the Mine.

Before discussing the present scheme of mining in vogue there, the general "lay-out" of the mine may briefly be described. There are three shafts which, more or less, equally divide up the property. The most important point in the scheme of attack is, of course, the central shaft, which is situated about 2,250 feet from the eastern shaft.



Bantjes Consolidated Mines: The Central Shaft.

The west shaft lies about 2,250 feet distant from the central, so that these shafts divide the mining area into three equal portions. Furthermore, equal distances intervene between the eastern shaft and the Aurora West boundary, and the western and the boundary of the Vogelstruis Consolidated Deep.

Pushing Down the Central Shaft.

The central shaft, which is of five compartments, has been sunk to a depth of 2,800 feet, and from this the 13th level is just being opened out. The intention is to proceed with the sinking of this down to 4,500 feet, but future policy in this respect will, of course, be influenced by considerations such as labour and development. This shaft has now been carried down several levels below the deepest point at which stoping is proceeding. There are one or two stopes on the 6th level, but to all intents and purposes the 5th is the deepest mining level in the property, so that there are eight levels opened up below the stoping area. From these a very large tonnage can be blocked out in a minimum of time; indeed, the present ore reserves could be greatly augmented on a comparatively small footage. At present the 6th has been driven as a main haulage level, and ore will be gravitated down to this point. At a later date the 10th, 14th, and 18th levels will be utilised for a similar purpose, the idea being to have every fourth drive a main haulage level, and to let ore gravitate down to these from the three levels above. The third level in the upper workings is also to be used as a haulage—a subsidiary haulage level—and in about four months time the western section will be further advanced in the matter of development, and ore from the western section upper levels will be allowed to gravitate down to this plane. In the eastern section the shaft has been sunk to a depth of about 100 feet below the 10th level.

Bantjes Consolidated: The Mill.

The Ore Reserves.

The ore reserves have been re-calculated as at December 31st, 1911, to be as follows:—

	Tons.	Value. Dwts.	Stoping Width. Inches.
Main Reef	25,136	6·1	47
Main Reef and Leader	10,947	6·5	39
Leader	67,791	8·4	38
South Reef	792,213	7·3	41
Total and Average	896,087	7·3	41

In addition, there are over three-quarters of a million tons of low-grade ore assaying 3·4 dwts. per ton. The Bantjes Consolidated is essentially a South Reef mine, but there are also considerable stretches of Main Reef Leader of very good value. It is encouraging to observe that the development of the Main Reef Leader in depth has been attended with good results. The values and widths disclosed in the lowest workings of the property may, in fact, be said to be wholly satisfactory, and to augur well for the future and the ability to block out a large profitable tonnage at very short notice. The Bantjes, as well as being a South Reef mine, is essentially a hammer-boy proposition. The great bulk of the ore is broken by hand; indeed, February was the first month during which a higher proportion than 10 per cent. of the ore was broken by machines. With a view, however, to economising in the matter of labour available so far as is possible, small drills of the Ingersoll and Waugh types are being employed where their use is practicable. The present labour complement of the company is 2,700, and a further 500 would be engaged immediately were they available. The labour position has, however, improved appreciably during the last few months. Previous to August last ore from development dumps was milled, but as the supply was better after that month, all ore was drawn from the mine, and a rise in grade and profit resulted.

As to the Future.

As the directors', consulting engineer's, and manager's reports, together with the usual financial statements, appeared in our last issue, we do not here propose discussing such matters as capital expenditure, working results, and financial position. A few words as to the general outlook for the company must, however, be said. The Bantjes Consolidated, although an outcrop mine and situated in the western part of the Central Rand, has only within the past year or two commenced production. It is perhaps somewhat surprising that an earlier attempt was not made to bring this property to the producing stage, but financial considerations and the unsatisfactory labour outlook proved retarding factors, which could not be disregarded. However, the belated commencement of milling has brought a host of advantages in its train. The financial affairs of the company have been properly adjusted, and now stand on a sound and satisfactory footing. The labour position at the property, too, although it has greatly hampered operations, and is still capable of much improvement, is now fairly

Bantjes Consolidated: Another View of the Central Shaft.

good. Moreover, the management have been able to take full advantage of all recent improvements in mining and metallurgical practice. The Bantjes, it may be said, has had the full experience of two decades of research, experiment and striving, and has benefited by them from the word "go"—a somewhat unusual state of affairs for a Rand outcrop. The development work carried out around the central shaft has placed the company in a very sound position underground, and there must be but few mines on the Rand of corresponding size that have so large a number of stope faces as this property. The life of the mine, as already stated, is so long that it would be idle to venture any predictions in this regard on the basis of present crushing capacity. Of course, at a later date the plant will, no doubt, be largely increased and extended. The present equipment consists of 100 stamps and 3 tube mills, and of these 65 were at work last month. More stamps should be got to work at an early date, and we anticipate an improvement of about thirty-three per cent. on the last declared monthly profit in the very near future.

OUR COLLIERIES AND THE BRITISH COAL CRISIS.

"It's an ill-wind that blows nobody any good." And this saying is exemplified by the fact that orders for coal for export are freely flowing in to Witbank Collieries, as a consequence of the coal strike in the Old Country. All the collieries in this district are working at full pressure, says the *Middelburg Observer*, and, if the great strike in Great Britain lasts for a few more weeks, the ever insistent cry for more trucks and cheaper rates will give the Minister of Railways and Harbours a troublous time. Enquiries made in Cape Town indicate that the Natal Collieries are working night and day in an endeavour to cope with the increased demand for coal, and, owing to an inefficiency of railway rolling stock, the line to Durban is blocked, while many ships which require coal can find no berthing place in the harbour and are waiting outside in the bay. The price of coal in Cape Town has risen, and it is stated on good authority that the Union-Castle Company, who have to obtain 50,000 tons of coal before the end of April in order to fulfil their contracts, are endeavouring to purchase every ounce of coal obtainable. This large amount of coal is required in addition to the increasing amount of fuel for the use of the company's own business. It is also understood that this company's steamers are not carrying much South African produce to England on account of having to carry sufficient coal to enable them to make the double journey to England and back. Owing to the scarcity of coal a number of ships are being hung up at the several ports, and delays are being caused at Cape Town by reason of there being insufficient boats to go round the coast to Natal in addition to the block at Durban. The Government, however, has stepped in and helped to relieve the congestion now being experienced on the Natal side by offering to bring overland from five to six thousand tons of coal per month.

A Day's Output at Witbank Station.

New Steyn Estate.

In the report issued last year, it was pointed out that the property of the New Steyn Estate had been considerably enlarged by the purchase of: (a) 248 claims on the farm Roodepoort immediately adjoining the Roodepoort United Main Reef, Durban Roodepoort Deep and Princess Estate; these 248 claims, together with two held previously, are situated along the northern boundary of the "Mynpacht" mining ground on Vlakfontein. (b) 318 claims on Vogelstruisfontein, forming the eastern extension of the Vlakfontein mining ground (balance of purchase price paid in 1911), and that the acquisition of further claim areas had been contemplated but not brought to a definite conclusion. The position at date remains unaltered. For the purpose of adequately exploiting and working the large property, a considerable amount in excess of the £68,000 forming the extent of the present funds is required. The general financial conditions prevailing during the past year, however, were not favourable to the procuring of the necessary capital, and the board has, therefore, been reluctantly compelled to continue a waiting policy.

Kamfersdam Diamonds.

Work on this mine is about to be resumed, new managers having been appointed.

Alluvial Diamonds.

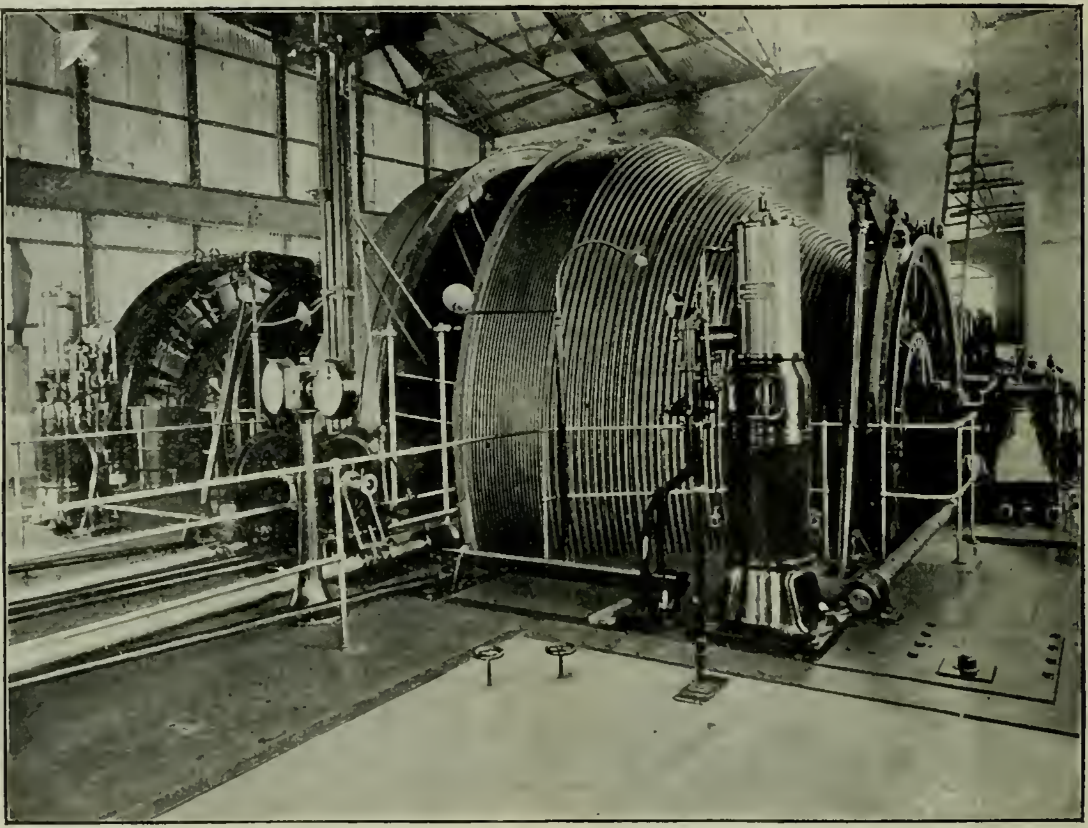
The returns of diamonds found in February in the various diggings of the South-Western Transvaal are to hand. Summarised, the returns are as follows:—

	Carats.	Value.		
Mooifontein	3.757¾	£16,155	17	0
Bloemhof	1.118½	5,995	14	0
Weltevreden	796¼	3.365	5	0
London	335¾	1,556	6	6
Modderkraal	192¾	1.237	0	6
Goedgenoeg	57¾	710	6	0
Zoutpan	62	414	15	0
Panfontein	64¾	197	7	6
Christiana	31½	164	5	0
Other diggings	48½	223	7	6
	6,465½	£30,019	18	0

THE YEAR WITH THE CINDERELLA CONSOLIDATED.

"A Most Difficult Period"— Shaft Sinking Progress—Ventilation and Underground Conditions Excellent.

The total revenue of the Cinderella for the year 1911 was £279,437 1s. 4d., and the operating expenditure amounted to £229,672 1s. 2d., leaving a gross profit of £49,765 0s. 2d. This, added to the credit balance of £100,871 19s. 5d., brought forward from the previous year, gives a total of £150,636 19s. 7d., which has been dealt with as follows:—Debenture interest, £21,770 16s. 8d.; debenture trustees' fees, £300; cost of printing debenture bonds, £725 18s. 4d.; stamping debenture bonds, £5,000; depreciation of stores, £652 19s. 3d.; profits tax and Government share of mining rights, 1910, £1,130 6s. 8d.; profits tax and Government share of mining rights, 1911 (estimated), £2,442 8s.; balance, being unappropriated profit carried forward, £118,614 10s. 8d.; total, £150,636 19s. 7d. The reduction works at present consist of 100 heavy stamps, three tube mills, and cyanide plant, etc. During the year under review, an average of 70 stamps ran for 331·294 days, crushing 192,341 tons of ore for a yield of £264,606 14s. 9d., equal to £1 7s. 6·171d. per ton. The working costs amounted to £229,672 1s. 2d., or £1 3s. 10·581d. per ton, leaving a gross profit on mining of £34,934 13s. 7d. The payable ore reserves are estimated by the manager at 740,157 tons of an average assay value of 6·73 dwts. per ton. In addition, there are 191,451 tons of ore fully developed taken to suspense, and 305,658 tons at present classified as unpayable; it is anticipated, however, that a large proportion of the " suspense " tonnage and a portion of the ore classed as unpayable, will allow of profitable treatment when opened up. The directors' report adds:—" As you are aware, your mine has hitherto had only one outlet by way of the main vertical shaft. This placed the management under restrictions imposed by the Government Single Outlet Commission, according to which, *inter alia*, only a certain number of workmen were allowed underground at any one time. To obviate these disabilities, a drive was started to connect the company's shaft with the Angelo Deep shaft of the East Rand Proprietary Mines, Ltd., and the same was completed to within about 200 feet of its objective, when it had to be discontinued, owing to the cessation of work by the East Rand Proprietary Mines, Ltd., at that point. Your company was, therefore, compelled to seek an outlet elsewhere. This was done by a drive connecting the shaft with the Cason shaft of the East Rand Proprietary Mines, Ltd., and that work was completed at the end of November last. The above-mentioned restrictions have since been removed. The new central vertical shaft of seven compartments has been sunk to a depth of 1,582 feet. The main incline shaft at the foot of the old main shaft has been sunk a further 110 feet, making in all 992 feet."



Hoisting Plant, Cinderella Consolidated.

Manager's Report

The Manager, Mr. F. Girdler-Brown writes, *inter alia*:—Main Incline Shaft: A further 110 feet have been sunk, making a total of 992 feet. At 900 feet the 5th level was established and the station and ore bin cut. Driving on the 5th level south section and cross-cutting to the reef on the north section has been proceeding. The south section driven shows no improvement in value. The north section, were intersected by box hole at the 5th level, assays 32.0 dwts. over a stoping width of 42 inches. Angelo Deep—Hercules Connection Drive: 1,061 feet were driven, making a total distance from our shaft of 3,764 feet. At the end of last year it was expected that this drive would be connected in about six months and the single outlet restrictions removed; it was, therefore, a great disappointment to your company when in the month of June with only approximately 200 feet to drive we were informed by the East Rand Proprietary Mines, Ltd., that it was their intention to cease all work in the Angelo Deep and allow the water to rise. We had, therefore, to seek other means of effecting a second outlet. The west drive on the 3,000 feet level (the ground acquired from Government) was at this time 1,114 feet from a point at this level, to which the Cason Shaft was being sunk, and it was decided to substitute a connection with the Cason shaft. This work was completed on the 30th November, the total distance being 448 feet of driving and 666 feet of crosscutting, thus giving the very creditable average rate of driving 222 feet per month. In order to connect the 3,000 feet level (the level of the Cason shaft) and the lower workings of the mine raising and winzing had to be done between the 3,620 feet and 3,000 feet levels. Main winze and raise connection: The winze was sunk a distance of 307 feet below the 3,000 feet level, and the raise was carried to the same horizon, where both were connected by means of a 300 feet drive, thus establishing a travelling emergency exit from the lowest workings to the surface by means of the Cason shaft. The total expenditure during the year in connection with this work has been £10,909 18s. 6d. The costs are high owing to: (1) The necessity for running the compressor alone for this work for eight hours each day and the whole of Saturday night and Sundays, being equal to 1-5th of the total compressor hours; (2) The long distance for tramming and carrying the air and water mains; (3) The high wages paid in order to get the fast rate of working; (4) The raising, particularly expensive owing to height of raise and nature of this difficult work. The winze that has been sunk will be used to complete the scheme of ventilation as well as for an emergency exit, and when the fan now arriving on the property is installed, will effectually ventilate the whole of the north section. The total distance raised and sunk is 828 feet, and the ordinary method of opening out a mine by means of an incline shaft, which would have had to be sunk for this distance in order to develop the claims to the north of the old boundary, has not been necessary, the work of blocking out the ground having proceeded from this raise and winze. The lower part of the raise is equipped as a shaft, and from a height of 225 feet on the incline the 3,450 feet level has been developed. The ore reserves made available by this work are approximately 375,000 tons. Central shaft: 1,428 feet were sunk during the year, making a total of 1,582 feet. A permanent pump chamber was cut at a depth of 1,000 feet. The shaft is equipped with two engines for the purpose of rapid sinking. Full advantage, however, of these facilities have not been made use of owing to the dearth of native labour. The average number of natives per shift for the year was only 43, while to sink efficiently at the rate of about 160 to 180 feet per month, 75 natives per shift are required. A number of these large shafts are being sunk on the east, and far east Rand, and by comparison the labour in each is about 60 per cent. only of their requirements. At the present rate of sinking the reef should be met some time during the last quarter of 1912. With an improvement in native labour it will, of course, be met at an earlier date

In spite of the actual shortage of native labour experienced, development was carried on vigorously. The ore actually developed during the year was 861,639 tons, 38 per cent. of the underground native labour force having been engaged on this work. It will be noted that of the total footage, 4,134 feet, equal to 31 per cent., was raising and winzing. During the year this work has received especial attention in order that a large number of stope faces should be available immediately the single outlet restrictions were removed, and a large number of miners permitted below. The total footage cut during the year was as follows:—Driving, 7,050 feet; raising, 3,045 feet; winzing, 1,089 feet; cross cuts, 2,212 feet; total, 13,396 feet.

On taking out the actual ore reserves as standing fully developed ready for stoping, the totals are:—North section, 528,273 tons; south section, 708,993 tons; total, 1,237,266 tons. Classified as follows:—North section, 528,273 payable; 6.56 dwts.; south section 211,884 payable, 7.16 dwts., 191,451 suspense, 305,658 unpayable; totals, 740,157 payable; 6.73 dwts.; 191,451 suspense; 350,658 unpayable. Note re suspense: The ore placed to suspense consists of large blocks of ground between the 3,620 and 3,000 feet levels; although these are developed by means of driving, and two winzes and raises are in progress, further information is required for accurate valuation and their inclusion in the ore reserves. The average value of residues were:—Sands, .526; slimes, .310; sands and slimes, average, .452. The average value of residues shows a further decrease of .062 dwts. Yield and extraction from all sources.—Tons milled, 192,341 tons; average screen assay, 6.933 dwts.; total gold contents of ore on basis of screen assay, 66,676.106 ozs.; total gold recovered, 62,509.492 ozs.; total gold in residues, 4,343.723 ozs.; total gold accounted for, 66,853.215 ozs. Costs and profits.—The total revenue, including £14,830 6s. 7d. from sundry sources, amounted to £279,437 1s. 4d., while working costs absorbed £229,672 1s. 2d., leaving a profit of £49,765 0s. 2d. It will be noted that no decrease in value of ore milled has taken place, the smaller profits being due to the higher working costs. Costs have been increased owing to the shortage of native labour. Under the single outlet restrictions 800 persons were permitted below at one time, but owing to the dearth of labour the average for the year was only 686. The policy of development might have been changed and a larger tonnage milled, but it was felt that the most advisable course was to build up an adequately large ore reserve, with a necessary number of stope faces available, so that with the removal of the single outlet restrictions mining could be carried on under normal conditions, provided a sufficient labour supply be forthcoming.

Sand Filling.—Considerable difficulty was experienced in the use of the wood-lined piping installed last year, and in common with like installations by other mines, was found impracticable; furthermore, the heavy costs of pumping water from 4,000 feet made this method prohibitive. An experiment was made by installing a wooden box, one foot square, from the surface to 3.900 feet; the sand being sent down dry, and mixed with water at that level, and from there distributed. Considerable difficulty was experienced at the beginning, but the introduction of air jets and careful attention to other details have made it practicable to send down 1,000 tons daily.

The whole of the machinery and plant has been maintained in good working order. Cinderella section.—The No. 1 hauling engine, which had for some time given considerable trouble, was replaced during the year by a 5-ton electric hoist, which was brought into use at the beginning of July and has since been working satisfactorily. A new 12½-cwt. steam hammer and a Landis bolt-screwing machine have been added to the workshops plant. Two spitzkastens have been erected at the cyanide works. The erection of the pumping machinery at the new dam was completed and the pumps started up in April. A new sample crusher and a "Rival" assay furnace were erected at the assay office. An electric pump and necessary driving gear were installed at the 4th level of the incline shaft—Cinderella section. A 6-cell transformer house with control house was completed and equipped during the year.

Cinderella section.—18 new rooms were added to the native compound, and a new ward was built on to the native hospital, whilst the location for married natives was completed. Central section.—10 additional rooms were built on to the native compound, and a location, capable of accommodating 100 married natives, was erected. Six new married quarters for white workmen were also erected.

The review of this year's work emphasises again how adversely the dearth of native labour has affected the progress of operations. I would emphasise the fact that although stoping ore from the deepest point on these fields, the ventilation and underground conditions are in excellent order. I am pleased to place on record my appreciation of the manner in which the mine staff has assisted me during the past—a most difficult—year.

The Year with the Roberts Victor Mine.

The sixth report of the Roberts Victor Diamonds, Ltd., does not make too satisfactory reading for shareholders, despite the "exceedingly satisfactory prices" obtained for the company's output. The directors state that they have had to consider the question of cutting down expenditure as much as possible, but the loss for the year carried to appropriation account stands at £12,588. The diamonds sold, less cost of realisation and diamonds on hand, amount to £59,000. As against this the mine working expenses amounted to £67,535, and this with other items brought the total expenditure up to £71,802. The report states *inter alia*:—

> The testing of the old mine at the 394 feet and 634 feet levels, carried out by a careful series of test washings of blue ground from those levels, has shown that the contraction of the pipe, coupled with a low average yield of diamonds, renders working at present unprofitable. Though prospects are not encouraging, yet it must be borne in mind, as the consulting engineer points out in his report, the test washing from the 634 feet level yielded 53·4 carats per 100 loads. Your directors are therefore keeping the water in the mine down to the 314 feet level by pumping, with a view to the possibility at some future date of doing further work in depth. All the blue ground that could be chambered down to the 314 feet level has been mined and brought to the surface for treatment. The surface development of the new area, to which reference was made in the last report, has shown what appears to be an extension of the old mine fissure. This has been opened up at two points, which are called No. 1 and No. 2 areas. The plans accompanying the consulting engineer's report show the position and extent of the workings. The combined extent of these two areas is just under 25 claims, but it is probable that as the overburden is stripped preparatory to removing the yellow ground for washing, the workable area may be found to be larger. Development work at the 314 feet level and the 394 feet level below the No. 1 area proves conclusively that a contraction, similar to that which occurred at the old mine, takes place under the No. 1 area, and consequently the amount of ground available for treatment is limited in a downward direction. Further work of a testing and exploratory character has been carried out (details are given in the reports), but the results achieved have been of an unfortunate nature. Washing from the yellow ground from the No. 1 area, with which a proportion of the blue from the old mine was mixed, was commenced in November, and is being continuously carried on. It is impossible to forecast how long washing operations may be continued, but as the blue ground from the old mine dumped on the surface is being exhausted, it is on the No. 1 and No. 2 areas that the management will have to rely for ground for treatment. Extensions of the area of 25 claims, above referred to, may be found to be workable as the areas are opened up, and it is probable that sufficient yellow ground can be extracted from this source to carry on washing operations for at least twelve months from the present date, and there is always the possibility of additional ground being opened up.

To enable the company to proceed with the opening up of the new areas, the development and testing of the old mine in depth, and the extraction of blue from the old mine, the directors had to make financial arrangements for a loan. The amount of this, with accrued interest at the end of December, was £30,715, since which date "substantial reductions have been effected."

POSITION AND PROSPECTS OF THE CITY DEEP.

Consulting Engineer Explains Disappointing Returns and Shows Why Higher Profits May Now Be Looked For.

THE City Deep earned a profit in 1911 of £90,935 14s. 6d. The balance of working capital brought forward from last year was £61,813, making a total of £152,749 for the year. This sum has been appropriated as follows:—Expended on capital account £117,581, Government profits tax £5,430, balance carried to balance sheet £29,738. The balance of £29,738 1s. 8d. is represented by cash and cash assets over and above liabilities. An item of £30 in the balance sheet under the head of property, etc., represents the difference between the cost of freehold property purchased and sold during the year. Under this head also appears £131,200, which is the value agreed upon to be paid in twenty annual instalments of £6,560 to the Government for the undermining rights of water-rights, etc., in extent 13·5451 claims. There are two items in the working expenditure and revenue account to which the directors draw attention, the first being £15,022 0s. 6d. appearing as preliminary stoping, and the second, £25,713 16s. 7d., appearing as extraordinary development expenditure. The former amount represents expenditure on preliminary stoping operations incurred prior to the commencement of milling extending from 1909 to 31st December, 1910, and now that there are profits available for the purpose, is written off. The latter amount represents the difference between the expenditure on mine development for the year and the amount charged to working costs. Some of this expenditure might have been charged to capital account, as it is chiefly represented by expenditure during the year on further developing blocks of ore included in the ore reserves as at 31st December, 1910. Seeing, however, that the ore reserves at the close of the past financial year show a shortfall below those of the previous year, the directors have considered it wise that the whole amount should be written off. The cash position of the company is not affected thereby. Legal proceedings have been instituted against the company with a view to contesting the titles to certain of its property. The directors state they are assured by their legal advisers that there is no cause for alarm as to the security of the company's titles. At the close of 1910 it was anticipated that the Rand Mines Power Supply Company, Limited, would be able to supply the company's full requirements of electricity and compressed air by about May last. The supply of power commenced in March last, but, for various reasons, the Power Company has as yet been unable to meet the full requirements of the company, and this has necessitated the running of steam plant in order to make up the deficiency. Arrangements are being made by the Power Company to increase its plant, and it is expected that a full supply of power will be available about the end of the year.

CONSULTING ENGINEER'S REPORT.

Mr. Hy. Stuart Martin, the consulting engineer, writes, *inter alia*:—The operations of your company for the year ended 31st December, 1911, have been disappointing. The tonnage milled was 349,713 tons, made up of 260,661 tons from the mine and 89,052 tons from the surface dump. The total working profit realised was £134,886, towards which the mine rock contributed £105,928, dump rock £24,936, and accumulated slimes £3,972. The tonnage handled has been less than anticipated and not representative of the capacity of the mine or reduction plant. The value of the ore mined has, however, been satisfactory, and in close agreement with the average value of the ore developed. The chief reason for the restricted tonnage output from the mine has been the poor efficiency obtained from the underground labour force. The large proportion of natives from tropical Africa showed little aptitude for underground work, and the tonnage produced per native has been abnormally low. The physical characteristics of the rock in the mine are quite normal, and with a more skilful labour force the output from the mine will show a steady increase. The native labour force has, at no period during the year, been sufficient for the company's requirements, and it has been concentrated on increasing the output of ore from the mine. The result has been that development operations have been much restricted, necessitating the splitting up of some of the larger developed blocks in order to provide more points of attack for stoping. At the commencement of mining operations, the working conditions were unfavourable owing to insufficient ventilation; this difficulty has been largely removed by the installation underground of a ventilating fan. In the stopes on the upper level, the conditions as regards ventilation are not yet good enough to look for a high standard of efficiency; steps are, however, being taken to improve matters in this direction by making a new connection from the main downcast shaft to the horizon of the 2nd level. This means crosscutting from the shaft a distance of about 1,100 feet. The payable ore reserve at 31st December, 1911, was estimated as follows:—Main Reef Leader, 2,063,157 tons, value 8·1 dwts.; South Reef, 15,648 tons, value 4·8 dwts.; total and average, 2,078,805 tons, value 8·1 dwts. The above ore reserves may be classified as follows: (1) Ore completely blocked out for stoping, 1,442,902 tons, value 8·1 dwts.; (2) ore fully valued, but not completely blocked out for stoping, but which will be rendered available for stoping by current development, 498,981 tons, value 8·0 dwts.; (3) ore contained in shaft pillars, 136,922 tons, value 8·2 dwts.; total, 2,078,805 tons, value 8·1 dwts. Compared with last year, there is a reduction of 335,759 tons, due to the fact that more ore has been stoped than developed, and that the pay limit has been slightly increased, but chiefly to the fact that the year's operations show that owing to the difficulty of ventilating back stopes a more conservative view has been taken of workable size of blocks developed above the upper level of the mine. At the date of writing, the native labour is coming in more satisfactorily, but is still far from our requirements, and before this report is in your hands we hope to have completed some of the additional development that will be required to render the whole of the reserves available for stoping, as well as further additions to the ore reserves in new ground. The unpayable tonnage developed in the mine amounts to 236,421 tons of 3·1 dwts. average value, about half of this ore consisting of South Reef. The total ore developed in the mine indicates an average stoping width of 57 inches. The ore reduction plant has worked satisfactorily throughout the year. As soon as labour is available, the No. 1 shaft, which is situated about 4,000 feet east of the No. 2 shaft, must be sunk a further estimated depth of 800 feet to strike the reef. This is necessary before the ground below the 9th level in the eastern section of the property can be blocked out and worked. The 8th and 9th levels are connected to the No. 1 shaft by long crosscut drives. The ore reserve is substantial and of good grade; and with the improved efficiency which can be reasonably expected higher profits can safely be looked for. The past year's work is not indicative of what can be expected from the mine. I regret to report that there have been two changes of management during the year, as well as several changes in the staff.

MANAGER'S REPORT.

The Manager, Mr. M. O. Tillard, writes, *inter alia*:—The working expenditure and revenue account stood thus: Total revenue, £537,548 9s. 7d., equal to £1 10s. 9d. per ton milled; total working costs, £406,634 9s. 11d., equal to £1 3s. 3d. per ton milled; working profit, £130,913 19s. 8d., equal to 7s. 6d. per ton milled. In addition to the above, a profit of £3,972 6s. 5d. was obtained from the treatment of 15,172 tons of accumulations, the results from which were as follows: Value of yield, £6,676 4s., equal to 8s. 10d. per ton treated; working costs, £2,703 17s. 7d., equal to 3s. 7d. per ton treated; working profit, £3,972 6s. 5d., equal to 5s. 3d. per ton treated. The capital expenditure amounted to £107,710 18s. 5d. During the year the mine suffered severely from several factors, which adversely affected the profits. The shortage of native labour proved a serious drawback, which was accentuated by the poor efficiency shown. This efficiency is still considerably below normal. Although the mine is almost entirely dependent on purchased power, the power company was unable to supply compressed air before the end of May, and since then the quantity thus obtained was not constantly up to our requirements, with the result that the mine's own compressors have been running under steam intermittently throughout the year, to the detriment of both the machine drill efficiency, and continuous winding, as the boiler plant was never intended to be large enough to serve both the compressors and winding engines after milling had commenced. A breakdown of the underground pumping plant towards the close of the year pointed to the necessity for its duplication, in order to avoid disorganisation to continuous hoisting. Work on a new sump and pump chamber is therefore in hand, and good progress is being made with the installation of the duplicate pumping set. The original scheme of exploiting the large area between the 5th level and the northern boundary, by means of rises and back stoping, was found to offer too many difficulties to ventilation and rapid progress, and it was therefore decided in the latter part of the year to put out a crosscut north from a point 2,137 feet below the collar of No. 2 shaft, to intersect the reef at a point about 310 feet south of our northern boundary. The total length of the crosscut is estimated to be 1,100 feet. During the year 109,716 tons of rock were sent to the sorting and crushing stations from the surface dump, and the profit derived from this source was £24,986. It will be noticed that a profit of £3,972 was obtained from the treatment of the accumulated slimes taken over from the Rand Central Ore Reduction Works. A satisfactory feature of the year's operations was the steady grade of ore from the mine, which confirmed expectations derived from the ore reserves. As regards the mining position, there are 52 stope faces, of which 14 are in back stopes. With reference to the development, 46 drives, winzes and raises are being advanced, and work would be immediately commenced in 49 additional faces if there were sufficient native labour.

THE RAND AS A FIELD OF LABOUR.

The Exodus of the Capable Miner—Special Disadvantages of Rand Mining—The Best Rate of Wages in the World.

The thought-compelling paper read on Saturday evening last before the Chemical, Metallurgical, and Mining Society by Mr. Barry, of the Nourse Mines, presents to us an aspect of the phthisis scourge which has been frequently referred to in general terms, but has never yet been so specifically enlarged upon as it was on the occasion referred to. The fact that phthisis has driven away large numbers of good miners from the Rand, has killed many others, and is still an active agent in the depletion of the skilled labour resources of the mines, was remarked upon in our last issue, and Mr. Barry's paper gave *in extenso* what we condensed into a few words. There is little doubt that the Rand as a field for labour of the best kind has been steadily acquiring an unsavoury reputation, which has reached to the uttermost ends of the earth, even beyond those places where its magnificent record of low working costs has aroused the admiration and astonishment of mining communities. Miners' phthisis is not an unknown disease in other mining regions; it has attracted no small amount of attention in Cornwall, and in Western Australia the creation of a Government Commission has been found necessary to investigate the matter. On the Rand, however, the extent to which it prevails, not merely among those engaged in actual mining, but among those also whose daily pursuits compel them to spend a great deal of time underground, even including electricians, is sufficient to show that it exists in a particularly malignant and all-pervading way. Why this should be so has not yet been satisfactorily explained, although suggestions have been offered in this direction. For instance, the peculiar spiculæ-like character of the fragments of rock which are carried into the air from machine drill holes, the poisonous condition of the average mine atmosphere, till recently, and the rarified state of the atmosphere at this altitude.

Vast Development Progress.

Whatever be the true reason, it seems sufficient to accept the enormous amount of machine drill development as one of the primary causes, and a glance at the figures given from time to time in the statistics of the Mines Department shows that, even in comparatively slack times, the distances covered month by month are amazing. It is not uncommon to find that nearly ten miles of main drives and cross-cuts have been accomplished in any month, to say nothing about five or six miles of what is grouped under the heading of other development. It is not difficult to conceive that the drilling of the huge footage involved in this operation must keep up a never-subsiding cloud of dust in those mines where the necessary measures are not taken to prevent it. No account need be taken of the sources of dust in stopes and other places to assure ourselves that the rapid progress which is essential if our low-grade big-milled mines are to be kept going is in itself a condition which singles out the Rand as a particularly dangerous, and therefore undesirable, place for miners who have the ordinary wish to keep alive as long as possible. In the face of this dust plague, the lesser requirements of comfort, of no small consideration in themselves, nevertheless, sink into insignificance. In the report of Mr. Walton, the manager of the Rose Deep, for example, it is thought important enough to chronicle the fact that "A new European change house was erected at No. 4 shaft, and it has been of great service in attracting good miners." Good miners, no less than indifferent ones, are obviously susceptible to the advantages offered by a decent bath and the opportunity of getting into clean clothes as soon as they reach the collar of the shaft. If comparatively small things can make a difference in the class of skilled labour at a mine, it will scarcely come as a surprise to the community that the absence of death-dealing dust is a still greater factor—as Mr. Barry has pointed out—the only factor worth mentioning, indeed, if its importance be considered.

The Wages Problem.

Apart from this dust evil, the Rand as a field for skilled mine labour has advantages which are exceeded in few other mining regions of the world. It is said, of course, that the high rate of pay which prevails here is merely commensurate with, and dependent upon, the dangers incurred, including the danger of phthisis. To some extent this may be true, but when the wages paid to tradesmen generally is remembered, it appears that the scale of underground wages is in conformity with the scale of living which prevails in this part of the Union, rather than specially contrived as an offset to the dangers and discomforts of mining. The campaign against the big cheque and the rage for low working costs during the past two or three years, moreover, have tended to disregard the idea of risk in favour of the notion of efficiency alone. Even so, the rate of wages is not a meagre one, and if other conditions were equally satisfactory, there is little doubt that miners would flock back again as in earlier days. In the report of the Department of Mines of Western Australia for 1910, we find that the wages payable to mining employees under various arbitration awards and industrial agreements—in which, according to all accounts, the employees have not come off second best—are materially lower than the wages paid to the same grades of labour on the Rand. Rock drill men, for instance, obtained from 15s. 6d. to 12s. 4d. per shift in the former region, according to the particular nature of their occupation, in shafts or elsewhere. In the latter field the pay for the same grades varied from 23s. 11d. to 20s. 3d. Miners on hand labour averaged from 15s. to 10s. 10d. in Western Australia, as against 25s. and 17s. 11d. for contract and day's pay on the Rand. It has to be borne in mind, moreover, that the wages in the first case are paid for actual work, whereas in the second they are paid, practically, for supervision. Trammers were paid as low as 10s. 10d. in Western Australia for doing work which trammers on the Rand were paid 13s. 6d. per shift for supervising. And so the list might be extended. There are allowances to be made for the cost of living, of course, but even with these the rate of pay upon the Rand is on the whole superior to that elsewhere to a marked degree.

The Need of the Skilled Miner.

The statements of Mr. Barry should make it clear to everyone that phthisis has got to be overcome, not only for humanitarian reasons, but for economic reasons also. Never before were skilled, reliable, and contented miners more necessary to the business of the Rand, and of South Africa, than they are to-day, when the native labour supply is more precarious and more inefficient than ever before, and when experience and understanding are essential elements of success in the mining of the deeper levels. The need is one that will increase rather than diminish as time goes on, as levels become deeper, and as larger tonnages are required. Upon the heads of the mining industry will rest the responsibility of stamping out the dust evil, and that they appreciate the extent of their responsibility is evident from the way they have taken the matter in hand. Upon the Government of the Union also rests the duty of bettering living conditions generally, so that the tide of departing miners may be turned back into South Africa. The little expedient of training "sons of the soil" will go but a very short way towards solving the problem of skilled white labour, even if it be continued for many years, and if, in the meantime, the mining industry is to be starved of efficient and abundant white labour from oversea, the outlook for these "sons of the soil" and all their relatives and patrons will be a bad one. Without a prosperous mining industry to bring it about, the probability of South Africa ever becoming the "white man's country" which many people hope for is extremely small, and without a contented and capable population of miners the foundations of the industry must become dangerously insecure. If Mr. Barry's illuminating paper has served to put the finishing touch to a mountain of evidence in favour of a thorough dealing with the phthisis scourge, it has no less brought into prominence the fact that good miners are becoming scarce in a field which should be the most attractive in the world. If any additional inducement is required to encourage the crusade against miners' phthisis we must confess ourselves unable to conceive one.

THE LANCASTER WEST POSITION AND PROSPECTS.

Reduced Costs—Increased Profits—Vigorous Development Work Augments Ore Reserves.

The profit earned by the Lancaster West on the mining operations for the year 1911 amounted to £33,220 17s. 7d. The total value of the yield was 22s. 8·378d., working cost (including mine development redemption) 20s. 1·587d., leaving a profit of 2s. 6·791d. per ton milled. The yield of gold was:—From mill and tube mills, 3·600 dwts.; from cyaniding current sands and slimes, 1·725 dwts.; from cyaniding accumulated slimes, 0·041 dwts.; total, 5·366 dwts. fine gold per ton milled. The profit and loss account shows: Credit balance brought forward from 1910, £43,873; profit on mining operations during 1911, £33,220; revenue from other sources (water sold, rents, etc.), £7,682; total, £84,776.; against which the following amounts have been charged, viz.: Debenture interest, trustees' fees and redemption premium, £7,981; interest on temporary advances, £201; French fiscal taxes, £358; contribution *re* Miners' Phthisis Sanatorium, £211; assessment *re* Miners' Phthisis Allowances Fund, £265; donations to charities, £186; depreciation of machinery and plant, £26,638; total, £35,845, leaving a balance of £48,930 15s. 8d., which has been carried forward to the credit of profit and loss account for 1912.

Consulting Engineer's Report.

The Consulting Engineer, Mr. W. McC. Cameron, writes:—The yield is down by 2.3d. per ton milled, as compared with the previous year, which was covered by the recovery from accumulated slimes treated, the total yield distributed over the tonnage milled remaining the same, namely, 22s. 8.4d. per ton milled. Working costs were reduced by 9.5 per ton milled in the face of a largely increased cost for native labour and the necessity of changing from a hand basis for breaking ore to a machine basis. The working profit has correspondingly increased, and, including sundry revenue, amounted to £40,903 for the year. In the latter months of the year arrangements were made to treat accumulated slimes and 9,770 tons of this product were treated for a revenue of £2,268. This product is being treated now at the rate of about 2,000 tons per month. Development was continued vigorously throughout the year, and a total of 16,605 feet of work accomplished, of which, however, practically 4,000 feet were barren cross-cuts necessitated by the heavy displacements on Battery Reef caused by the series of longitudinal faults encountered. At Battery No. 1 Shaft, the reef has just been recovered east of the last (No. 3) of these faults on the 13th and 14th levels, and for the 230 and 210 feet driven repectively on these levels unpayable values have been disclosed. At Battery No. 3 Shaft work has been underway down to the 17th or bottom level. The development in this section is gradually being completed and further shaft sinking will shortly be necessary if the development footage which is now being restricted is to be kept at a normal rate. On Botha Reef, No. 1 Shaft, some further prospecting on South Reef was carried on, but no payable ore disclosed. At No. 2 Shaft a considerable amount of development work was done on South Reef and additional payable reserves opened. On Main Reef at this shaft some footage was done in the upper levels, opening up small areas of reef, while the 11th level, in which previously no payable ore was discovered, was driven westwards showing good results for a distance of 290 feet. This is probably the most favourable feature of the year's development work, for no payable ore had been found previously on this reef tributary to No. 2 Shaft below the 8th level, and there is a large area on the western side of the mine which has possibilities of yielding a large tonnage. No. 3 Botha Shaft has, as in the past few years, remained idle. The yearly remeasurement of ore reserves shows the following tonnages developed as at 31st December, 1911:—Payable ore—Battery Reef, 401,300 tons assaying 6.65 dwts. over a milling width of 40.4 in.; Botha Main Reef, 18,460 tons assaying 7.15 dwts. over a milling width of 42.1 in.; Botha South Reef, 53,000 tons assaying 6.09 dwts. over a milling width of 27.5 in.; total payable ore available, 472,700 tons assaying 6.65 dwts. over a milling width of 40.4 in.; shaft pillars and ore unavailable at present, 43,500 tons assaying 9.33 dwts. over a milling width of 45.7 in.; unpayable ore, 326,000 tons assaying 3.45 dwts. over a milling width of 41.0 in. From the payable ore reserves a yield of 82 per cent. of the mine assay value may be expected, but allowance must be made for low grade ore from development work which will be milled at the same time and a yield of more than 5.05 dwts., or, say, 21s. 6d. per ton, cannot be anticipated. The available payable reserves have been increased during the year by 41,700 tons, but at a cost, on account of the large amount of barren cross-cutting necessitated by the large faults encountered, much above the rate of redemption. The total development account as at December 31st, stood in the books of the company at £55,065 including the ore standing developed at Botha No. 3 Shaft, which, distributed over the 472,700 tons of available ore given above, amounts to 2s. 4d. per ton, while 2s. 6d. per ton milled (including ore from development) is being written off for redemption. The average number of natives employed during the year was 2,044, against 2,465 in the previous year, and the complement has been as low during the latter half of the year as 1,762. The great shortage in labour supply made it necessary to change from hand work for breaking to machine work. The centralisation of compressor plant and the increased efficiency of machines has made it possible to do this to a very large extent, but the change over has increased the working costs considerably through the expenditure for machine plant, which has been charged to that account.

General Manager's Report.

The General Manager, Mr. C. R. Davis, writes *inter alia*:—The development of the Battery Reef was carried on with vigour during the year. In the western section the development of the mine to the 17th or lowest level served by No. 3 Shaft is nearly complete. At No. 1 Shaft the development of the eastern section has been hastened on the 12th, 13th and 14th levels. The development of the eastern section has been retarded by the long cross-cuts necessary to recover the reef east of No. 3 Fault, and to date the values disclosed on the 13th and 14th levels east are disappointing. The reef exposed, however, represents but a very small part of the virgin area yet to be explored in this section of the mine. On the Botha series, the opening of payable reef by the 11th level west drive in heretofore unexplored ground promises well for future development of the Main Reef West of No. 2 Shaft, and may prove an asset of considerable importance. The average stoping width over the mine for the year was 49.5 inches, and the calculated milling width 42.52 inches. The tonnage mined from the Botha series forms practically the same percentage of the total mined as obtained during the previous year. On the Battery Reef the tonnage mined was equally divided between the East and West sections. Mining conditions were radically affected by the shortage of native labour, necessitating a change from hand to machine mining. This was accomplished at a very considerable expense for new equipment, charged to working costs. The new conditions resulted in loss of efficiency during the period necessary to acquire a sufficient working force, but satisfactory progress has been made. Practically all hammer boys in the Botha South Reef stopes have been replaced by air hammer drills. The results compare favourably with hand stoping as regards costs, the width of stopes remaining the same. On the Battery Reef, the machine stoping is largely confined to the eastern section, the conditions lending themselves to this class of work. At the present time about 65 per cent. of the tonnage mined is obtained from machine stopes, as compared with 8 per cent. at the beginning of 1911. No shaft sinking was done during the year. Results from reduction operations (based on 258,943 tons milled):—Totals—Value of yield, £291,608 2s. 2d., value per ton 22s. 6.276d., actual extraction per cent. 93.371; slimes accumulated—value of yield, £2,268 2s. 4d., value per ton 2.102d. Grand totals—Value of yield, £293,876 4s. 6d., value per ton 22s. 8.378, actual extraction per cent. 93.371. A change house equipped with shower baths, change room, steam heated and provided with facilities for issuing a hot ration, has been provided for tropical natives. During the year the average cost of feeding per shaft worked increased 32.5 per cent., and the average wage paid for same period increased 4.9 per cent., as compared with the previous year.

E. J. MOYNIHAN,
CONSULTING ENGINEER.
PLANS, SPECIFICATIONS, REPORTS AND ADVICE, MINING EQUIPMENT, STRUCTURAL WORK AND FINANCIAL ADVICE.
10, ANGLO-AUSTRIAN BUILDINGS. Box 2061.

RESULTS FROM THE ROODEPOORT UNITED.

Decreased Ore Reserves—Shaft Sinking Delays Development.

THE total revenue of the Roodepoort United Main Reef for 1911 from all sources amounted to £400,790 15s. 6d., and the operating expenditure to £315,486 17s. 11d., leaving a gross profit of £85,303 17s. 7d. This, added to the credit balance of appropriation account of £56,822 9s. 1d., brought from the previous year, gives a total of £142,126 6s. 8d., which has been dealt with as under:—Adjustment of profits tax for 1910, £28 16s.; estimated profits tax for 1911, £8,400; interest, £16,236 19s. 1d.; balance of appropriation account carried forward, £117,460 11s. 7d. An average of 55 stamps ran 342·330 days, and with tube mills crushed 366,490 tons, yielding gold, etc., of the value of £397,383 19s. 11d., equal to £1 1s. 8·23d. per ton. The working costs were £315,486 17s. 11d. (17s. 2·6d. per ton), and the gross profit from mining operations was £81,897 2s. 0d. (4s. 5·63d. per ton). The fully developed payable ore reserves are estimated by the manager at 448,800 mining tons of an average value of 5·49 dwts. per ton over 42 inches, exclusive of 533,900 tons of an average value of 2·88 dwts., which are at present classified as unpayable and consist nearly all of Main Reef. The payable ore reserves (fully developed) show a decrease of 168,935 tons, as compared with the estimated reserves at the end of 1910, the value being practically the same. This decrease is due to the fact that the United Section was nearly all developed during 1910, and development in the Kimberley Section had to be delayed pending the sinking of the shaft. The widening of the Kimberley Main incline shaft was completed in April last, and sinking proceeded with. The total depth reached at the end of the year was 2,503 feet. The Kimberley East Shaft was sunk to a depth of 990 feet, and opened up a considerable quantity of payable ore. The delay in completing the widening of the Kimberley Main Incline Shaft, owing to the bad condition in which it was found to be after dewatering, has retarded development operations, with the result that not sufficient points of attack were available to keep the full mill of 100 new stamps at work. This drawback is expected to be remedied gradually if the native complement can only be kept at a fair level.

MANAGER'S REPORT.

The Manager writes, *inter alia*:—The main incline shaft (old Roodepoort United) has been kept in good order. The pumps have worked satisfactorily, and the renewing of the 6in. water column was completed during the year. The widening of the Kimberley main incline shaft down to 51 feet below the 10th level station was completed last April, when sinking was commenced. 807 feet have been sunk, which brings us to within 22 feet of the 14th level. In all 1,108 feet have been stripped, sunk and timbered during the period under review. The four skip roads have been laid down. The two western roads, where the 6-ton skips work, are equipped with 80lb. rails, with 12in. by 4in. runners under them, which makes them very permanent and solid. The two eastern sinking compartments have been equipped with 60lb. rails. The 10in. air pipe has been carried down the length of the shaft, and a 14in. ventilating pipe, with motor and exhaust fan on the surface, was installed during the year. This has facilitated sinking, as the smoke after blasting clears out very quickly. In November last we encountered a dyke which, owing to its containing very soapy seams, retarded sinking. The dyke had no effect so far as the dislocation of the reef was concerned. It was 26 feet wide at the point of intersection against 105 feet on the 10th level, which gives us, we hope, 79 feet more reef formation. The total depth of the shaft on the 31st December, 1911, was 2,503 feet. During the year the 9th and 10th level stations were enlarged and ore bins of 200 tons capacity put in. The 11th and 12th level stations were cut and a temporary ore bin made at the 11th level. It is the intention to cut one large ore bin at every other level to handle the rock from the two levels. The rock from the upper level of the two will be shot down through one of the winzes close to the main ore bin. This will, naturally, save considerable expense in the cutting of stations and making of ore bins. Two Pearn pumps, each of 10,000 gallons capacity per hour, with the necessary electrical appliances, were installed at the 8th level, with a sump of 175,000 gallons capacity. These pumps have been working very satisfactorily. The Kimberley east shaft was sunk 494 feet. Stations, with ore bins, were cut at the 3rd and 4th levels, and drives started on the 3rd level east, on the South and Main Reefs, also a crosscut north at the 4th level, which we hope will intersect the South Reef almost immediately. The shaft is 70 feet below the 4th level and has a total depth of 990 feet. This shaft has been very advantageous to the mine, as it has opened up a considerable quantity of payable rock. No driving will be done on the west side on the 3rd and 4th levels on account of the close proximity of the big dyke. Sinking was retarded during the last three months of the year owing to the shortage of unskilled labour. The total payable tonnage fully developed at the 31st of December, 1911, is estimated at 448,800 tons, of an average assay value of 5·49 dwts. over 42 inches. This width is now taken as a basis, having been proved during the year by measurement, etc., that this is the correct figure to calculate our tonnages on, and not, as last year, on 38·5 inches. There are in addition 533,900 tons, of a value of 2·88 dwts., which are considered unpayable at the present. Of these 338,000 are Main Reef in the old United section and 5,100 South Reef in the same section, which leaves 21,900 tons South Reef and 118,900 tons Main Reef unpayable in the Kimberley section. This seems to indicate a higher percentage of payable ore in the Kimberley section than in the United, and as we have a lot of virgin ground in the former section to develop, there is every hope that the mine will open up favourably. Details and particulars of ore reserves are tabulated below: Payable ore fully developed—South Reef: 231,300 tons at 6·36 dwts. over 36 inches; Main Reef, 217,500 tons at 4·56 dwts. over 48 inches; total, 448,800 tons at 5·49 dwts. over 42 inches. Unpayable ore fully developed: South Reef, 27,000 tons at 2·71 dwts. over 36 inches; Main Reef, 506,900 tons at 2·89 dwts. over 48 inches; total, 533,900 tons at 2·88 dwts. over 47 inches. In taking the ore reserves for 1910, which totalled 617,735 tons, of an assay value of 5·47 dwts. over 38·5 inches fully developed, as compared with 448,800 tons of an assay value of 5·49 dwts. over 42 inches for 1911, you will notice that there is a decrease of 168,935 tons. This is owing to the fact that during 1911 there were no available faces on the South Reef for development, and very few on the Main Reef, owing to the whole of the United section having been practically developed during 1910, and the Kimberley section drives having been all up to the boundaries on the western side, whereas the big dyke on the eastern side did not allow of any ground being opened up until the shaft had been sunk. As stated elsewhere in this report, the shaft was extended 1,108 feet during the year, and the 9th and 10th levels put in commission. At the 11th and 12th levels the stations were cut and drives commenced. There are also another two levels (13th and 14th) available at the present time. We have every reason to anticipate that during 1912 development will be vigorously pushed on, as we will have at least eight faces available on the South Reef in the Kimberley main incline to go ahead with, and also eight on the Main Reef in a few months' time. Furthermore, as the 3rd, 4th and 5th levels in the Kimberley East will be opened up, thus giving us another three faces, there is no question but that we shall increase our ore reserves considerably during 1912, always allowing for the fact that the supply of unskilled labour does not fall off. *Machinery and Plant.*—The necessary alterations and repairs were effected during the year. The plant at the Kimberley main incline has run very satisfactorily, giving very little trouble. The cost of maintenance has been low. The reduction plant has run very well and has given practically no trouble. *Reduction Operations.*—Mining: For the year 441,894 tons were mined and 8,726 tons of dump rock dealt with, making a total of 450,620 tons, as compared with 303,587 tons for the previous year. 18·895 per cent., or 85,146 tons, were discarded as waste. The total expenditure on mining was £177.829 16s. 2d., an average of 9s. 8·45d. per ton milled, as compared with 9s. 7·7d. per ton milled during 1910. Milling: An average of 55 stamps ran 342·330 days, crushing 366,490 tons, the stamp duty per day being 19·465 tons, as against 250,642 tons and a stamp duty of 8·333 tons for the previous year. This large increase in crushing is due to the much greater efficiency of the new plant, the two old mills having been still in use up to August, 1910. The milling cost for 1911 averaged 1s. 5·806d. per ton, the cost for 1910 having been 1s. 11·476d., a saving of 5·670d. per ton thus having been effected. The total fine gold recovered by amalgamation was 64,990·840 ounces, valued at £275,134 3s., the average recovery being 3·547 dwts. per ton, equal to a value of 15s. 0·17d. The increase in fine gold won by milling compared with the year 1910 is 22,967·544 ounces, value £97,165 14s. 7d. Cyaniding: 222.631 tons of sand were treated, the average value of charges being 2·366 dwts, and of residues ·463 dwt. per ton. 141,304 tons of slimes were treated, the average value of charges being 1·352 dwts. and of residues ·356 dwt. The cost per ton milled was 1s. 3·014d., as compared with 2s. 1·749d. for the previous year, a saving of 10·735d. per ton, which illustrates in a very practical manner the great superiority of the new reduction plant over the old works closed down during the preceding year. The fine gold recovered by cyaniding was 28,880·501 ounces of a value of £122,249 16s. 11d., as compared with 20,969 956 ounces, value £88,658 15s. 10d., for the year 1910, an increase of 7,910·545 ounces, value £33.591 1s. 1d. The total gold recovered from all sources for the year is 93,871·341 fine ounces, equal to 5·123 dwts. per ton, as compared with 62,993·252 ounces and 5·026 dwts. for the year 1910. *Revenue and Expenditure.*—The total revenue for the year, including sundry revenue, amounted to £400,790 15s. 6d., the expenditure being £315,486 17s. 11d., and total profit £85,303 17s. 7d. The total revenue per ton milled averaged £1 1s. 10·46d., the expenditure 17s. 2·6d., and the profit 4s. 7·86d. As compared with the previous year, the profit shows an increase of £50,086 9s. 2d., or 1s. 10·139d. per ton, and the costs a decrease of 1s. 8·874d. per ton. *General.*—The number of white employees in the company's service on 31st December, 1911, was 250, as compared with 288 on the last day of the previous year. The native labour during the year was somewhat short, having fallen from 3,077 in December, 1910, to 2,665 in December, 1911. This shortage has retarded progress of shaft sinking, but stoping operations have not been affected in the same proportion.

NEW GOCH: A YEAR'S RESULTS.

Improved Extraction—Scarcity and Cost of Labour Affect Development and Working Costs.

During 1911 the New Goch earned £126,403 18s. 5d., and with the addition of sundry revenue amounting to £2,000 5s. 1d., the gross profit totalled £128,404 3s. 6d. This, added to the credit balance of £3,301 8s. 4d. brought forward from the previous year, gives a total credit of £131,705 11s. 10d., which has been dealt with as follows:—Interest on debentures, £9,768 15s.; premium of 8 per cent. on £21,900 debentures redeemed during year, £1,752; debenture trustees' fees for 1911, £250; estimated Government profits tax for 1911 (plus amount under-estimated for 1910), £10,372 2s.; taxes paid to French Government, £499 6s.; dividends Nos. 4 and 5 of 7½ per cent. and 5 per cent. respectively, £68,750; revenue appropriated for redemption of debentures on the 1st July, 1911, £21,900; revenue appropriated for capital expenditure during year on equipment and development in excess of working capital provided, £5,807 14s. 8d.; depreciation on stores, £1,924 14s.; balance, being unappropriated profit, carried forward, £10,681 0s. 2d. The full mill of 120 stamps ran for 337·915 days and (with tube mills) crushed 346,862 tons, yielding gold to the value of £417,756 17s. 4d., equal to 24s. 1·05d. per ton. The working costs totalled £291,352 18s. 11d. (16s. 9·59d. per ton), leaving a gross profit from mining operations of £126,403 18s. 5d. (7s. 3·46d. per ton). The average duty per stamp per twenty-four hours for the year shows an increase from 8·2 tons in 1910 to 8·554 tons in 1911, and this is reflected in the extra tonnage milled during the past year of 8,244 tons over that of the preceding year. The payable ore reserves are estimated by the manager at 962,575 tons of an average mine value of 5·06 dwts. over an average stoping width of 63·4 inches, exclusive of 190,748 tons of an average value of 2·53 dwts., which are at present classified as unpayable. During the year the electrification and re-arrangement of the plant as well as the erection of one additional tube mill (making four in all) were completed. The amplified cyanide plant has been able to reduce the value of the residues as compared with previous years. Sorting has been increased by nearly 9 per cent. Scarcity of native labour and higher native wages and recruiting charges have detrimentally affected the amount of ore developed and the working costs, especially under the head of "Mining."

MANAGER'S ANNUAL REPORT.

The Manager, Mr. E. H. Bulman, writes, *inter alia*:— No. 4 Shaft (main incline with four compartments) was sunk 265 feet from a depth of 2,697 feet to 2,962 feet, and has been fully equipped with the necessary timber, ladderway, rails, etc. The 16th level station, with an ore bin to hold 200 tons, has been cut and timbered. A new pump station has been cut, and a horizontal three-throw 6in. by 12in. electric pump, with a capacity of 12,000 gallons per hour, installed at the 7th level to intercept the bulk of the mine water, which previously fell to the 9th level to be pumped back to the surface. The total expenditure on this shaft, including stations, ore bins, sumps, and pump chambers has amounted to £7,018 0s. 1d., equal to £26 9s. 8d. per foot sunk. The total footage developed during the year amounts to 6,474 feet, distributed as follows:—Drives, 3,899 feet; rises and winzes, 2,303 feet; crosscuts, 222 feet; crosscut rises, 50 feet; total, 6,474 feet. The footage on the different reefs being:—Main Reef and Main Reef Leader, 4,601 feet; South Reef, 1,406 feet; total, 6,007 feet: driving off reef, 167 feet; total 6,474 feet. The whole of this development was done in No. 4 mine. The total expenditure on development work was £12,500 9s. 10d., equal to £1 18s. 7.410d. per foot, and the tonnage developed by this footage amounted to 406,360 tons at a cost of 7.383 pence per ton. This expenditure was also charged direct to working costs. Owing to the native labour available being insufficient to produce the larger tonnage required during the year, certain machines which should have been used for development had to be used for stoping work, with the consequence that the tonnage developed is not as large as could have been desired. The estimation of available reserves of ore in your mine at 31st December, 1911, is as follows:—Ore (3.5 dwts. and over):

	Tons.	Value. dwts.	Width. inches.
South Reef	336,352	5.14	49.1
Main Reef Leader	85,772	6.03	37.6
Main Reef	87,523	4.93	64.8
Main Reef and Leader	452,928	4.85	96.1
	962,575	5.06	63.4

Under 3.5 dwts.—

	Tons..	Value. dwts.	Width. inches.
South Reef	83,066	2.60	38.8
Main Reef Leader	53,148	2.37	37.2
Main Reef and Leader...	54,534	2.57	81.1
	190,748	2.53	44.9

The ore reserves compared with the estimate of the previous year show an increase in the tonnage of payable ore of 220,887 tons, but a decrease in value of 0.28 of a dwt. The reason for this is the inclusion of large bodies of 3.5 to 4 dwt. reef, which can now be classed as payable rock, owing to the efficient system of sorting, which has been so effectually carried out during the year. During the year 480,714 tons were mined and hauled. Of the tonnage of 480,714 tons mined 12.932 per cent. were mined from No. 3 section and 87.068 per cent. from No. 4 section. The additional 3,679 tons of reef were sorted out and taken from the old Nos. 1 and 2 development dumps, which gives a total of 484,393 tons transported to the sorting and crushing station. The average width mined in the various stopes throughout the year was 62.87 inches. The total cost of mining for the year was £168,007 16s. 1d., equal to 6/11.243 per ton mined, or 9/8.246 per ton milled. These figures compared with those of the previous year show an increase of 7.170d. per ton mined, and 1/9.548 per ton milled. The increase in the cost per ton mined is largely due to the increased wages paid to natives, which also influence the cost per ton milled, but the chief reason for the large increase per ton milled is the much larger tonnage of waste rock sorted out, amounting to 54,417 tons, or 8.719 per cent. more than in the previous year. The general condition of the mine is good, and care has been taken to leave sufficient pillars throughout, so that there need be no anxiety with regard to caving of ground in the future. The milling of 484,393 tons, 138,131 tons, equal to 28.517 per cent., were discarded as waste. The mill of 120 stamps ran 337.915 days, crushing 346,862 tons, representing a duty of 8.554 tons per stamp per diem, the mesh of screen used being equivalent to an average of about 150 throughout the year. The gold recovered by amalgamation was 58,587.690 fine ozs., or 3.378 fine dwts. per ton milled, equal to 59.327 per cent. of the total recovery from all sources. Of this the tube mills (4) accounted for 31,393.393 fine ozs., or 53.584 per cent. of the total amount recovered by amalgamation. For the year the total cost of milling amounted to £29,957 3s. 4d., equal to 1/8.73 per ton milled, being a reduction as compared with the previous year of 3.33 pence per ton, which is due, firstly, to the reduction of the cost per unit of purchased power, and, secondly, to the increased tonnage milled, owing to one extra tube mill allowing a coarser screen to be used. During the year under review, 347,340 tons of sands and slimes were treated, consisting of 227,220 tons of sands and 120,120 tons of slimes, giving a recovery of 40,166.828 fine ozs., or 2.316 fine dwts. per ton milled, equal to 40.673 per cent. of the total output; the value of the recovery per ton treated was 2.313 fine dwts. The average value of the residues per ton treated was for sands .500 dwts., and for slimes .372 dwts., the average value of all residues being .456 dwts. per ton treated. and the same figure per ton milled. The decrease in value of residues is due to the completion of the new plant, which was accomplished early in the year, and which gives a sufficiency of capacity which was not available in the previous year. The revenue and expenditure at the mine are:—Revenue from gold, £417,756 17s. 4d.; total expenditure, £291,352 18s. 11d.; working profit, £126,403 18s. 5d.; sundry revenue, £2,000 5s. 1d.; total profit, £128,404 3s. 6d. The working costs for the year show an increase of 1/6.325 per ton milled as compared with the year 1910, which to a great extent is due to the vigorous sorting out of waste rock. The revenue from gold for the year shows an increase of £18,560 17s. 2d. Although the supply of natives has been better than during 1910, the operations of your mine called for a so much larger tonnage that the shortage of labour has practically been felt to the same extent. There is no doubt that with a more plentiful supply the work which has been accomplished would have been done at a lesser cost. The average monthly complement of natives on the company's books, including contractors' natives, was 2,384, while the average number of company's natives working was 1,981, equal to 83.096 per cent. of the total number.

Rietspruit Diamonds.

The third ordinary general meeting of the Rietspruit Diamond Syndicate was held on March 14, Mr. W. Edwards presiding. In moving the adoption of the report and accounts for the period ended the 31st December, 1911, the chairman said the outstanding feature of the period under review had been the acquisition by the directors of the 75 per cent. interest in the block of claims—the "Argo" claims—in the Abercorn district, Rhodesia, which were favourably reported on by Mr. Jones, but upon which little work had yet been done.

THE YEAR WITH THE WEST RAND CONSOLIDATED.

Delay in Development Programme Causes Postponement of Extension of Crushing Plant —Bigger Tonnage Milled—Higher Grade —Slight Increase in Costs.

During 1911 the West Rand Consolidated earned a working profit of £48,904 19s. 5d., which, with the inclusion of sundry revenue, amounting to £9,423 4s. 1d., makes a gross profit of £58,328 3s. 6d. This, added to the credit balance of £47,599 8s. 7d. brought forward from the previous year, gives a total credit of £105,927 12s. 1d., which has been dealt with as follows:—Interest on debentures, £28,750; debenture trustees' fees, £300; cost of printing debentures, £985 0s. 10d.; stamps on debentures, £5,000; profits tax, 1910, £1,781 6s. 6d.; profits tax estimate, 1911, £1,553 16s.; French fiscal tax, £704 0s. 2d.; depreciation on stores, £4,467 10s. 3d.; balance, being unappropriated profit, carried forward, £62,385 18s. 4d.; total, £105,927 12s. 1d. The full mill of 100 stamps ran 302·004 days, and (with tube mills) crushed 319,640 tons, yielding gold to the value of £366,401 18s. 5d., equal to 22s. 11·11d. per ton. Working expenditure amounted to £317,496 19s., or 19s. 10·4d. per ton, leaving a profit from mining operations for the period of £48,904 19s. 5d. The average duty per stamp per twenty-four hours was 10·584 tons. The payable ore reserves are estimated by the manager at 1,003,000 mining tons, of an average assay value of 5·25 dwts., over a stoping width of 49 inches. To this may be added a further 111,000 tons of payable rock in respect whereof the final valuation is not yet available. Besides, there are approximately 307,000 tons of ore partially developed, the greater proportion of which will probably be payable. Milling operations during the past year show an improvement in tonnage as well as grade, although the improvement in grade has been counteracted by slightly higher working costs, due chiefly to the increased cost of native labour. Since March last, the whole of the plant, with the exception of the air compressor and the shaft hoists at the East Plant and hoists at Nos. 1, 3 and Rand Shafts, has been electrically driven by power purchased from the Victoria Falls and Transvaal Power Company, Ltd. The permanent headgear at the west shaft was completed, and an additional tube mill (making four in all) erected. The East and West Shafts have attained a depth of 1,816 and 1,417 feet respectively. The Rand Shaft (Battery Reef Section) was sunk to a total depth of 810½ feet. Development at the East Shaft, as well as in the Western Section (including No. 3 Mine) has progressed as favourably as the available native labour supply would admit. The shortage of native labour has adversely affected stoping operations, nearly 70 per cent. of the rock mined having to be broken by machines. Sand filling has been made use of to advantage in different parts of the mine. The directors regret that owing to the continued scarcity of native labour it has not been possible to make satisfactory progress with the programme of development expansion. Under these circumstances the contemplated enlargement of the crushing plant has also been necessarily deferred.

Manager's Report.

The Manager, Mr. Robert Pill, writes, *inter alia:*—Work below ground was confined to the No. 1 east shaft and western sections on the Main Reef Series, and to the Rand shaft section on the Battery Reef. Of the shaft sinking done the footage was almost equally divided between the west shaft on Main Reef and the Rand shaft on Battery Reef. The development returns show that 87½ per cent. of the total advance was made in the Main Reef mines, and 12½ per cent. on the Battery Reef. The distribution of development on the Main Reef Series was: 18 per cent. No. 1 mine section, 40 per cent. east shaft section, and 42 per cent. western section. The proportions of milling rock drawn from the various mines and reefs has been materially altered as compared with last year. The Battery Reef has become a contributor to the mill in a small degree, the amount of ore taken from the South Reef has decreased, and that from the Main Reef increased. The tonnage mined in No. 1 mine was much smaller, and that mined in the east shaft and western sections greater. The several mines supplied rock to the mill in the following proportions: No. 1 mine 43 per cent., east shaft 21 per cent., western section 27 per cent., and Rand shaft (Battery Reef) 9 per cent., the Main, South and Battery Reefs contributing 74 per cent., 18 per cent., and 8 per cent. respectively of the total actually broken by stoping. Owing to the continued shortage of native labour, machines, though quite unsuited to most of the ground mined, have again, perforce, been largely employed in breaking rock, and nearly 70 per cent. of the stoping has been done by their means. Development in No. 1 mine section consisted principally of winzing and raising, most of it being done between the 1st and 3rd levels in the eastern part of the mine. The Main Reef was stoped at all levels down to the 5th, and the South Reef from the surface to the 4th level. The reclamation work above the 1st level, referred to in my last annual report, was proceeded with, and a considerable tonnage of fair grade rock obtained thereby. The introduction of the sand filling process will allow practically all the pillars left in the richer parts of the old workings to be removed at a profit. Sand-filling has proceeded throughout the year on a scale adequate to requirements, and most of the areas stoped under the railway in the central and western parts of the mine have already been secured. The filling of the railway stopes east of the shaft is now being done. Nothing has been done in No. 2 mine section during the year beyond keeping the workings free of water. Sinking in the incline of the east shaft section was resumed in December, but little progress was made in consequence of trouble with water through a breakdown of pumps. The depth of the shaft is 1,816 feet bellow collar measured in the vertical and on the incline. The 10th level shaft ore bin has been opened out sufficiently to satisfy immediate requirements. The permanent shaft track in the two eastern compartments was extended during the year from the end of the curve to below the 11th level. Work in connection with installing a third electric pump at the 5th level is almost completed. At the close of the year the station for the 12th level, at a depth of 1,803 feet, was in process of cutting. Development was carried on at the 6th, 8th, 10th and 12th levels. The Main Reef was crosscut for at the 12th level in November, and driving on it commenced. A considerable amount of prospecting on South Reef, principally on cross raises from the Main Reef drives, was done throughout the mine. Stoping was confined to the Main Reef, ore being drawn from the 6th, 7th, 8th and 10th levels. During the year the west shaft was extended 416 feet to a total depth, on the incline, of 1,417 feet. At depths of 1,094½ feet and 1,353 feet, levels were set off corresponding in horizon to the 6th and 8th levels of the east shaft. A station of the size necessary for present requirements has been cut, and a waste rock bin provided at the 6th level; also a raise was put up from the shaft to the station level for the shaft ore bin. The sump for the permanent electric pumping plant to be installed at this level was being excavated at the end of the year. At the 8th level a shaft waste rock bin has been made, and the cutting of the station commenced. Development from this shaft has consisted in crosscutting north at the 6th level. The reef, however, was not intersected, dyke formation being entered just prior to the crosscut reaching the point where it had been projected. Boring by diamond drill has shown that the reef cuts out against the dyke some 30 feet below where the latter was struck in the crosscut. The dyke causing the trouble is that met with in the 3rd level crosscut north from shaft and its intersection, where found at the 6th level, is due to it flattening considerably below the 3rd. There is reason to suppose that the reef will be found on the 8th level at no great distance north from the shaft, and as the crosscut at this point was about to be started at the end of the year, further work at the 6th has been deferred pending proving the reef in this level. A large proportion of the footage developed in No. 3 mine has been in winzes and raises at the 2nd intermediate and 3rd levels. The 1st level drive east has reached the dip dyke forming the boundary between Nos. 2 and 3 mines, and the 2nd intermediate drive east is approaching the same disturbance. The 3rd level west is within a short distance of the West Rand Central Company's boundary. A development winze has been started from the 3rd level, at a point approximately south of No. 3 shaft, to go to the 6th level horizon for the purpose of proving and opening up ground in advance of the drive, which will be put in west from the west shaft. At the 31st December this winze had attained a depth of 333 feet, a further 240 feet remaining to be sunk. A small amount of work has been done in connection with proving the South Reef. Stoping operations, which were commenced here at the close of 1910, have been gradually extended during the year, and the tonnage now supplied by this mine represents roughly 31 per cent. of the total mined. Rand Shaft Section (Battery Reef)—The new incline shaft was sunk 426 feet to a total depth of 810½ feet. Stations were opened out at the 3rd and 4th levels, 467 feet and 683 feet respectively below collar, and developing commenced therefrom. A permanent ore bin was made at 3rd level, and one for waste rock at the 4th. The footage developed was comparatively small owing to the limited number of points of attack available; the range of work will, however, be increased as soon as the next level—the 5th—is reached. It has not been possible to do the amount of stoping that was expected in this mine in consequence of the small number of hammer boys available. Machines were tried, but had to be discarded, as suitable stoping widths could not be carried with them. The total cost of development was £52,244 2s. 7d., equal to £3 8s. 6·3d. per foot developed. *Ore Reserves and Reef Values.*—The payable tonnage fully developed and ready for stoping at the 31st December, and to which a probable grade can be assigned, is estimated at 1,003,000 mining tons of an average assay value of 5·25 dwts. over a width of 49 inches. This ore, under normal working conditions, should yield a recovery in the reduction works of from 22s. to 23s. per ton. To this total may be added a further 111,000 tons of payable rock, for which, owing to insufficient data, a final valuation cannot be given. In addition to the above fully developed ground, 307,000 tons show in the estimates as "partly developed, payable," and "partly developed, probably payable," for a large proportion of which an average mine grade is indicated. *Projected Underground Work.*—A certain amount of detail work still remains to be done in No. 1 mine section. The developing of No. 2 mine section does not enter into the present programme, East Shaft Section: The shaft will be sunk sufficiently far to allow of a waste rock bin for the services of the 12th level to be made, and will then be stopped pending the proving of values at this level. Should development results be satisfactory, it is intended to resume sinking. A long raise connection now in progress from the extreme end of the 8th level east to the 6th will be completed, and if the values so far indicated hold, the question of extending the 10th level, in the hope of entering pay ground to the dip of the block just referred to, must be considered. Some further prospecting in connection with the South Reef is also necessary; other than this, and the items already mentioned, no work of importance is contemplated. Western Section: It is proposed to stop the shaft for a time at the end of January, at a depth of about 100 feet below the 8th level, and then to proceed with cutting the electric pump chamber at the 6th level, and to complete what is necessary as regards the station, etc., at the 8th. Driving west from the shaft at the 6th level to develop the ground to the dip of No. 3 mine will be commenced at an early date and pushed, and opening up at the 8th level will proceed with all despatch. In No. 3 mine development is to be continued at all available points. Rand Shaft Section (Battery Reef): The shaft will be extended, and the mine opened out as rapidly as possible. *Surface Equipment.*—The more important items of maintenance and of additions and alterations to plant and buildings are referred to below. A new gear for more efficiently and economically handling mine and sorting-belt waste rock and ashes from the boiler plant was installed at the east shaft, and put into operation in November. The six Lancashire boilers forming a part of the east shaft steaming plant becoming unfit for work, were discarded in March and replaced by two new Stirling boilers of 250 h.p. capacity each. The Victoria Falls and Transvaal Power Company, which was supplying a small amount of power to the east plant at the beginning of the year, completed its east transformer station, and has supplied all the mine's requirements at that point since March. The air compressor and shaft hoists is the only machinery here now operated by steam. The change over from steam to electric drive in the mill was effected in February. Other work in connection with milling plant includes raising the mill shuttle belt two feet to increase the bin capacity, deepening the tailings wheel pit and fitting a bucket elevator in order to provide a catch pit for tailings, and means of emptying it in the event of power being shut off suddenly, and an overhaul of the pile blocks. This latter work was commenced in October, and will be carried on as opportunity offers. The fourth tube mill, referred to in my last report, was completed and brought into service early in the year. Additions to the cyanide plant comprises: Two new sand settling tanks, three sand and three slime treatment tanks, and one solution sump, with the necessary platform and pipe equipment. One 4in. slimes pump, with piping and launders, and one return water pump. The slime and sand tanks were put into use in June and August respectively. At the end of the year all the preparatory work in connection with introducing trucks to replace belts in the transfer of sand from the settling to the treatment tanks was completed, and a favourable opportunity was being awaited to make the change. Plate bending rolls and a new screwing machine were added to the workshops equipment, and the electricians' workshop was extended. One 8in. and three 3in. water service pipe lines and light and power cables were laid between the east and west plants. The following remarks may be made regarding the west shaft plant, which was in course of erection at the beginning of the year: The headgear, engine-room 3 and 6-ton electric hoists and breaker stations were completed early in the year. The 6-ton hoist was put into commission in March, and the 3-ton in May; both have given every satisfaction in running. The electrically driven air compressor, which was started up in December of last year, has been run intermittently when required. White and Kaffir change houses have been built, and a waste rock dump gear provided similar to that at the east shaft, referred to in an earlier paragraph. *Summary of Working Results.*—The returns for the year summarise as under: Mining—Tonnage mined, 359,249 tons; waste rock sorted, 39,559 tons; waste rock sorted, 11·01 per cent. Milling—Tonnage milled, 319,640 tons; average number of stamps running, 100 stamps; total days run, 302·004 days; average duty per stamp per 24 hours, 10·584 tons; tube mills working, 3·66 tubes; total fine gold recovered, 53,958·146 ozs.; recovery per ton milled, 3·376 dwts.; value of gold recovered, £228,403 19s. 9d.; value per ton milled, 14s. 3·50d. Cyaniding—Tons of sands treated, 186,271 tons; average value of sands charges, 2·548 dwts.; average value residues, 0·417 dwt.; tons of slimes treated, 129,853 tons; average value of slimes charges, 2·044 dwts.; average value of slimes residues, 0·266 dwt.; total tons treated, 316,124 tons; average value per ton treated, 2·341 dwts.; average value of residues, 0·355 dwts.; theoretical extraction, 84·83 per cent.; actual extraction, 88·20 per cent. Revenue and Expenditure—Working revenue, £366,401 18s. 5d.; working expenditure, £317,496 19s.; working profit, £48,904 19s. 5d.; working profit per ton milled, 3s. 0·720d. Working Costs—Mining, £164,358 13s. 9d., equal to 10s. 3·408d. per ton milled; sorting, crushing and transport, £10,813 0s. 3d., equal to 8·119d. per ton milled; milling, £27,029 2s. 2d., equal to 1s. 8·294d. per ton milled; cyaniding, £25,965 11s. 4d., equal to 1s. 7·498d. per ton milled; general charges, £24,664 19s. 10d., equal to 1s. 6·519d. per ton milled; head office charges, £23,144 7s. 8d., equal to 1s. 5·377d. per ton milled; development redemption, £41,521 4s., equal to 2s. 7·174d. per ton milled; total, £317,496 19s., equal to 19s. 10·389d. per ton milled.

Wolhuter G.M. Co.

The report for the quarter ended 31st January, 1912, states:—Expenditure and Revenue (for quarter), calculated on the basis of the tonnage milled:—120 stamps, 4 tube mills, and cyanide works; milled, 88,400 tons. Working costs, £74,632 19s. 8d., per ton 16s. 10.624d.. Profit for quarter, £45,330 16s. 1d., per ton 10s. 3.070d. Revenue, £119,963 15s. 9d., per ton 27s. 1.694d. The capital expenditure was as follows:—Shafts, £49 2s. 7d.; buildings, machinery and plant, etc., £1,867 5s. 5d.—£1,916 8s. No allowance has been made in the above statement for the Government tax on profits. Reserve gold carried forward to 1st February, 1912, 3,698.227 fine ounces. Mining:—Approximate tonnage sent to the crusher house, 102,483 tons; waste sorted out (14.132 per cent.), 14,483 tons—88,000 tons; in mill ore bins 1st November, 1911, 500 tons—88,500 tons; tons milled, 88,400 tons; in mill ore bins, 1st February, 1912, 100 tons. Milling—Number of stamps running, 120; total time run, 83.875 days; tons milled, 88,400; duty per stamp per day, 8.783 tons; amalgam recovered, 62,800.0 ozs.; assay value of ore milled, 6.944 dwts.; yield in fine gold, 19,494.107 ozs.; yield per ton milled in fine gold, 4.410 dwts. Cyaniding Sands—Tonnage treated, 54,400 tons; assay value of sands treated, 3.109 dwts.; yield in fine gold, 7,111.558 ozs.; yield per ton treated in fine gold, 2.615 dwts.; yield per ton milled in fine gold, 1.609 dwts. Cyaniding Slimes—Tonnage treated, 33,600 tons; assay value of slimes treated, 1.484 dwts.; yield in fine gold, 2,085.000 ozs.; yield per ton treated in fine gold, 1.241 dwts.; yield per ton milled in fine gold, .472 dwts. Recovered from all sources, 28,690.665 ozs., equals 6.491 dwts. fine gold per ton milled. Development—The payable tonnage developed during the quarter amounts to 81,715 tons, valued at 6.34 dwts. over 51.7 ins. stoping width. Deep Level Section:—Main vertical shaft—The development in this section shows a decrease on the last quarterly values, being 5.1 dwts. over 51.5 ins. for 1.310 feet sampled. 17th Level—Drive, South Reef, averages 7.2 dwts. over 48 ins. for 150 feet. Raise 4 East, on the same Reef, is also good, viz., 10.8 dwts. over 45 ins. 18th Level—Drive East, Main Reef, averages 7.8 dwts. over 68 ins., and has intersected the Galena Fault and stopped in consequence of the strong throw South in the country, but will be continued from the South Reef, when this drive reaches the above fault. Drive East, South Reef, continues poor and is in troubled country. 20th Level—Drive East, South Reef, shows a marked improvement on the last quarter, being 9.4 dwts. over 43 ins., as against 5.0 dwts. over 42 ins. Raise 1 East, on same Reef averages 10.2 dwts. over 50 ins. Drive West, however, continues poor, the values being 2.0 dwts. over 54 ins. The strong South Throw Fault has been struck both in the Main and South Reef Drives West, the former being stopped, but work will be continued in the latter. Drives East and West, on Main Reef, disclose low grade ore, viz., 3 4 dwts. over 56 ins. for 105 feet driven. East Incline Section:—East incline shaft—In this section good values are being maintained; 875 feet have been sampled averaging 8.3 dwts. over 51.7 ins. 16th Level—Drive West, Main Reef Leader, averages 6.4 dwts. over 42 ins. South Reef, Drive West, has reached the boundary and stopped, the values for the quarter being 6.3 dwts. over 56 ins. 17th Level.—Driving West on the Pyritic Bands the value continue good, viz., 9.1 dwts. over 55 ins. South Reef West remains poor, being 3.5 dwts. over 40 ins. 19th Level—Main Reef Leader, Drive West, shows an increase on previous report, being 14.4 dwts. over 45 ins. for 81 feet driven, as against 13.2 dwts. over 41 ins., whilst Leader and Main Reef combined average 9.1 dwts. over 96 ins. for the same distance. Winze 2 West, on Leader, goes 9.1 dwts. over 50 ins. 20th Level—Drive East, Main Reef Leader, continues good, viz., 9.0 dwts. over 46 ins., whilst the Western Drive shows 12.8 dwts. over 48 ins., and when combined with the Main Reef, 9.3 dwts. over 79 ins. South Reef, Drive East, averages 5.8 dwts. over 69 ins. for 140 feet developed. Footage developed: Deep Level, 1,526 feet; East Incline, 1,012 feet; Mynpacht, 83 feet; total, 2,621 feet. Tons developed or exposed during the quarter (includes ore mined from development): Assumed payable tonnage—Deep Level, 50,021 tons, assay value 5.70 dwts., over 50.1 ins.; East Incline, 31,550 tons, assay value 7.37 dwts., over 54.6 ins.; Mynpacht, 144 tons, assay value 3.94 dwts., over 38.9 ins. Totals, 81,715 tons, assay value 6.34 dwts., over 51.7 ins. Assumed unpayable tonnage—Deep Level, 5,731 tons, assay value 2.61 dwts., over 52.9 ins.; East Incline, 1,876 tons, assay value 2.67 dwts., over 48 ins.; Mynpacht, nil. Total, 7,607 tons, assay value 2.63 dwts., over 51.6 ins. Ore reserves—The payable ore reserves at date are: 764,797 tons, valued at 6.41 dwts. over 51.5 ins; partially developed, 23,215 tons, valued at 6.67 dwts. over 49.2 ins. Total, 788,012 tons, valued at 6.41 dwts. over 51.4 ins. The machinery and plant continue in good working order.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted for the consideration of the Editor that is not accepted by him will be returned if a stamped and directed envelope is enclosed for the purpose.

THE MEYER AND CHARLTON IN 1911.

Improved Yield—Decreased Working Costs—A Nine Months' Year.

The total revenue of the Meyer and Charlton for the year from all sources amounted to £210,496 5s. 6d., and the expenditure to £123,235 7s. 4d., leaving a gross profit of £87,260 18s. 2d. This, added to the credit balance of £102,978 18s. 7d. brought forward from the previous year, gives a total available profit of £190,239 16s. 9d., which has been dealt with as follows:—dividends Nos. 43 and 44 of 20 per cent. each, £80,000; estimated profits tax for 1911, £7,511 18s., *less* over-estimated tax for 1910 £652 7s. 7d.—£6,859 10s. 5d.; estimated percentage of annual net produce due to Government of the Union of South Africa in respect of undermining rights of Bewaarplaatsen, etc., £8,310; stores written down, £936 0s. 3d.; French taxes for 1911, £375 19s. 8d.; transferred to special reserve, being revenue expended on equipment, etc., in excess of working capital provided, £66,885 6s. 5d.; balance of unappropriated profit carried forward to new year, £26,873. The full mill of 75 stamps ran 247·705 days, and, with accessory tube mills, crushed 117,154 tons of ore, yielding gold to the value of £206,027 15s. 10d., equal to £1 15s. 2·064d. per ton. The working expenditure amounted to £111,237 19s. 2d., or 18s. 11·880d. per ton, leaving a profit on mining of £94,789 16s. 8d. (16s. 2·184d. per ton). The recovery shows an increase of 2s. 2·216d. per ton, as compared with the yield for the previous year. The payable ore reserves at 31st December last are estimated by the manager at 312,336 milling tons, of an average value of 10·099 dwts., being an increase of 63,010 tons and 1·499 dwts. on the estimated reserves at the end of 1910. These reserves have been paid for out of past profits, and in addition there is an amount of £18,618 11s. 2d. to the credit of mine development, which, as mentioned above, constitutes a fund for further extensive development operations in the future. A decrease in working costs has taken place since July last; this would have been greater had the keen competition in the native labour market not led to a rise in recruiting fees and wages.

MANAGER'S REPORT.

The Manager, Mr. D. T. Morton, writes, *inter alia*:—The work of enlarging the shaft was continued under ordinary working conditions until the end of February, by which time everything was in readiness for dismantling the old headgear, breaker station, etc. The mill was shut down on the night of Monday, 27th February, and crushing was not resumed until the morning of the 3rd June. The actual mining operations therefore extend only over a period of nine months out of the year. During the year the main shaft has been sunk 131 feet, making the total incline depth 2,742 feet, and the bottom is now within 92 feet of the 19th level. Whilst the stripping for the enlargement of the shaft was proceeding, it was impossible to continue sinking, as the rock broken could not be hauled, and when hauling was resumed shortage of labour prevented this important work being carried on until October. Timbering has been completed to a total incline depth of 2,686 feet. A measuring chute is being fitted to the main ore bin at the 18th level, to accelerate the filling of skips. The enlargement of the shaft from three to five compartments is now completed, and this shaft has been new timbered from the collar set down to the 14th level main ore bin. New 60lb. rails have been laid in the two rock skipways from the headgear.tip to the 18th level main ore bin, and in the two new man-skipways the 45lb. rails are laid from the headgear tip to the 14th level main ore bin. A new concrete collar set, and just below it four steel pipe sets with galvanised iron and concrete roof, were laid. A new 8in. air main and a new water main were put in, and the old ladder was replaced by a new one from the surface to the 14th level ore bin. Ore reserves at 31st December, 1910, 277,029 tons; add payable ore developed during 1911, 191,066 tons; plus ore to adjust recalculation results, 1,988 tons; total, 470,083 tons; deduct ore mined during 1911, 123,043 tons; reserve at 31st December, 1911, 347,040 tons This reserve is composed of: South Reef, 152,923 tons, value 5·24 dwts.; Main Reef Leader, 143,298 tons, value 14·50 dwts.; Main Reef, 50.8 tons, value 5·43 dwts.; total and average, 347,040 tons, value 9·09 dwts. An allowance of 10 per cent. sorting brings this figure to 312,336 milling tons with an averag evalue of 10·099 dwts. With longer backs and the prospect of ground more free of faults and dykes, the ore reserves will increase rapidly. Mining: Total tons mined, 123,043 tons; less waste sorted underground, 1,190 tons; total, 121,853 tons; less waste sorted on surface, 5,099 tons; total, 116,754 tons; plus difference in mill bins, 400 tons; tons crushed, 117,154 tons. The total ore broken amounted to 123,043 tons, from which 6,289 tons (equal to 5·111 per cent.) were discarded as waste. Number of stamps in operation, 75; average running time, 247·705 days; ore received from sorting station, 116,754 tons; difference in mill bins between 1st January, 1911, and 31st December, 1911, 400 tons; total ore crushed, 117,154 tons; crushing duty per stamp per 24 hours, 6·306 tons; yield, 18,735·340 fine ozs. The two tube mills continue to run satisfactorily. Total cost of milling and tube milling amounted to £13,438 7s. 2d., equal to 2s. 3·530d. per ton. During the year experiments have been made to find out if some more economical and effective method could be found than the ordinary blanket tables to deal with the exceptionally large quantity of rich pyritic ore, which does not yield readily to amalgamation. The results show that the present method of dealing with this peculiar ore, although crude, is so far the most satisfactory one. The following are the statistics of cyanide treatment: Tonnage treated—Sands, 83,541; slimes, 30,186; total, 113,727. Percentage of mill pulp: Sands, 71·309; slimes, 25·766; total, 97·075. Yield, 25,940·342 fine ozs. Assay value residues—Sands, ·547 dwt.; slimes, ·233 dwt.; total, ·464 dwt. The average value of the residues compares favourably with the previous year, when the average was ·588 dwt. The value of the yield from current sand and slime was £109,737 8s. 8d., while the working cost was £14,024 6s. 6d., equal to 2s. 5·596d. per ton treated. The accumulated slimes plant ran satisfactorily through the whole year. Tonnage treated, 36,369 tons; average value of charges per ton, 2·649 dwts.; total gold recovered, 3,995·799 ozs.; theoretical extraction, 82·949 per cent. The value of the yield was £16,973, and the working costs amounted to £6,119 6s. 9d., equal to 3s. 4·379d. per ton treated. This plant has now been in operation for two years, and the total tonnage treated is 72,714, with an average recovery of 2·123 dwts. per ton, and residue value ·536 dwt. The original estimate of the tonnage to be treated was 130,000 tons, with an average value of 2·4 dwts. per ton. Yield and extraction from all sources: Tons milled, 117,154; average screen value, 8·487 dwts.; total gold contents, 49,718·007 ozs.; add gold in accumulated slimes charges, 4,817·166 ozs.; total gold to be accounted for, 54,535·173 ozs. Gold recovered, 48,671·481 ozs.; gold in residues, 3,458·449 ozs.; increased amount in circulation, 2,896·000 ozs.; total, 55,025·930 ozs. The yield per ton rose from 7·790 dwts. in 1910 to 8·308 dwts. in 1911, an increase of 0·518 dwt. The theoretical extraction was 93·658 per cent., whilst the actual recovery amounted to 89·2[illegible] per cent. Summary—Total revenue, £210,496 5s. 6d.; total working costs, £111,237 19s. 2d.; working profit, £99,258 6s. 4d.; less amount expended during March, April and May when mill was shut down, £11,997 8s. 2d.; actual profit for the year, £87,260 18s. 2d. The average complement of natives for the year was 1,029, including Cape boys; but whereas the average for January and February was 1,215 and 1,200 respectively, the average for December was only 1,013. Owing to the electrification of the plant, we have reduced our requirements by 107, which still leaves us with a shortage at the present time of about 100 boys. Although we have not been affected to the same extent as outside mines by the increased wages offered as a consequence of the competition to obtain labour, still there can be no doubt that many of our old natives are being tempted by the higher wages offered elsewhere, and instead of returning to the mine as heretofore, they are going where they can obtain a higher rate of wages, and consequently we suffer in the drilling efficiency of both hammer and machine boys, owing to our obtaining a lesser number of skilled labourers. During the suspension of milling operations, the old wooden headgear was replaced by a larger steel one, and a new 5-ton electric hauling engine installed. The 3-ton steam hauling engine was converted into an electric hoist and re-erected on a new site. The old sorting and crushing station was taken down and the erection of a new one completed. The mill was thoroughly overhauled and a change over from the existing direct current to three-phase motors was effected.

Mine Mortality Returns.

In this week's "Government Gazette" are published the quarterly mortality returns (incuding diseases and accidents) of mine employees in the Union for the quarter ended December 31st last. Summarised under the four Provinces they are:—Cape: whites 10, coloured 83: Natal: whites 0, coloured 33; Transvaal: whites 122, coloured 1,787; O.F.S.: whites 6, coloured 130. The totals for all the Provinces are: whites 138, coloured 2,033. Under the heading of accidents are bracketed homicides and suicides. They are distributed as follows:—Cape: Whites, 2; coloured, 8. Natal: Whites, 0; coloured, 8. Transvaal: Whites, 19; coloured, 218. O.F.S.: Whites, 2; coloured, 13. Totals for all Provinces: Whites, 33; coloured, 247. The average death-rate, including accidents and disease, per 1,000 employees per annum was:—Cape: Whites, 18.340; coloured, 17.754. Natal: Whites, nil; coloured, 12.343. Transvaal: Whites, 18.078; coloured, 32.487. O.F.S.: Whites, 20.202; coloured, 38.719. The average monthly population of mine employees of different Provinces were as follows:—Cape: White, 2,181; coloured, 18,700. Natal: White, 529; coloured, 10,694. Transvaal: White, 1,188; coloured, 220,024. O.F.S.: White, 1,188; coloured, 13,430; making a total for the whole of the Provinces of: White, 30,891; coloured, 262,848. The total deaths were (both black and white): Cape, 93; Natal, 33; Transvaal, 1,909; O.F.S., 136; giving a total for all Province of 2,171, with the average of 29.563 per 1,000 employees per annum. The average for the four Provinces were: Cape, 17.815; Natal, 11.761; Transvaal, 10.912; O.F.S., 37.214.

TRANSVAAL CHAMBER OF MINES' REPORT.

The Labour Supply—Points from the Report of the Executive Committee for February.

The report of the Chamber of Mines for February has the following, *inter alia* :—The returns supplied by the Witwatersrand Native Labour Association, Limited, show the following results for the months of January and February :—Number of natives employed by members of the Association on last day of month (including natives in the service of mine contractors, but excluding natives in the employ of members of the Association in the districts of Barberton, Breyten, Rooiberg and Louis Moore) :

	January.	February.
On Gold Mines	184,046	190,320
On Coal Mines	7,805	7,922
On Diamond Mines	9,524	10,789
	201,375	209,031

The Witwatersrand Native Labour Association also furnishes the following information with regard to the natives recruited by the Association and its members during the month of February, 1912, and the districts whence they were obtained. These figures do not include natives recruited by mine contractors. The corresponding figures for the month of January are given in comparison :

Source.	January.	February.
East Coast—South of Latitude 22 deg. S. ...	3,818	4,144
North do. ...	1,417	1,986
Cape Province	6,998	4,246
Transvaal Province	795	1,116
Basutoland and Orange Free State Province	701	825
Bechuanaland	24	205
Natal Province	490	362
Swaziland	147	109
Rhodesia (including via Pietersburg)	40	187
Local	5,810	9.430
	20,240	22,610

The monthly report issued by the Department of Native Affiairs shows that at the 31st January, 1912, 304,014 natives were employed in labour districts of the Transvaal. Of this number, 214,650 were engaged on mines and on the various classes of works specified in Part I. of the Coloured Labourers' Health Regulations, 1906, and 89,364 were in other employ.

In February the Department of Native Affairs issued a notification that licences to recruit would be granted for the following districts, viz. : Dundee, Vryheid, Ngotsche, Piet Retief, to District Labour Agents or employers on signed acceptance of the following conditions *inter alia* that natives resident in the three first-named districts shall not be recruited for employment outside the Province of Natal except with the consent of the owners of the properties on which such natives reside; that natives coming from other districts shall only be recruited within the townships of Dundee, Vryheid. Louwsburg, Piet Retief; that no labour organisation may have more than one licence in each such district; that no licencee may employ more than two runners in each such district

In the "Union Government Gazette" of March 5th a notice appeared to the effect that the following classes of labour, viz. : Onsetters, underground engine drivers and underground banksmen, are exempted from the provisions of sub-section (1) of section 9 of the Mines and Works Act, 1911.

Mining Taxation Act, 1910.—Your Executive Committee made representations to the Government last month on the subject of the provisions of the above Act in regard to excess development, pointing out that these press hardly on mines where values are less regular and tend to discourage the policy of developing adequately ahead of the mill, and submitted certain suggestions for amendments of the Act in order to meet the case.

New Legislation.—Survey of Lands, Registration of Deeds, Townships—A sub-committee of the Chamber has had these draft Acts under consideration and has prepared a statement embodying suggestions for amendment of certain provisions contained therein. The Chamber was notified that a Select Committee of the Senate would be prepared to hear evidence, and accordingly Messrs. George Kent, R. T. Ford and your Legal Adviser have proceeded to Capetown, as witnesses for the Chamber before the Select Committee. Administration of Estates Bill.—With reference to this Draft Bill, which was published in the "Union Gazette Extraordinary" of October 19th last, a communication was sent to the Minister of Justice suggesting the simplification of certain points of procedure, and a reply was received to the effect that the amendments put forward by the Chamber had been incorporated in the Bill. Death Duties Act.—A draft Bill to consolidate and amend the laws in force in the several Provinces of the Union relating to the payment of duty upon the estates of deceased persons was published in the "Union Gazette" of February 24th, and is receiving the attention of the Chamber. Irrigation and Conservation of Waters Act.—Several amendments in this draft Bill have been suggested to the Minister of Lands in respect of reserving the rights of the holders of mining title.

Miners' Phthisis Prevention Committee.—The appointment of this Committee, to which reference was made in the report of your Executive in December last, was notified in the "Government Gazette" of February 27th. The objects of the Committee are "to inquire into by experimental or other investigation and to report from time to time upon the improvement of the methods for the prevention of miners' phthisis in the Witwatersrand Gold Mines, and to advise upon the introduction of a systematic and uniform policy and the amendments to the Mining Regulations which may be necessary for combating the disease."

Mr. E. A. Wallers and Mr. H. O'K. Webber having resigned their seats on the Executive Committee, the vacancies must, in terms of Article 41 of the Chamber's Constitution, be filled at the Ordinary General Meeting on March 21st. Nominations will therefore be received by the secretary before or at the meeting.

Representation.—The following changes in representation have been intimated :—The Jumpers Gold Mining Co., Ltd., Mr. H. P. Rogers *vice* Mr. J. Jourdan; The New Era Consolidated, Ltd., Mr. H. T. Elliott *vice* Mr. T. W. Reclam; Rand Klip, Ltd., Mr. G. R. Airth *vice* Mr. H. P. Webber; Durban Roodepoort Deep, Ltd., Mr. J. Andrew Cohen *vice* Mr. E. Jacobs; Main Reef West, Ltd., Mr. E. Wolfes *vice* Mr. R. Goldmann; Ferreira Deep, Ltd., Mr. F. Boerckel, as second representative of the Company; Village Main Reef Gold Mining Co., Ltd., Mr. S. C. Steil *vice* Baron R. Kellerspreg; Rose Deep Gold Mining Co., Ltd., Mr. E. J. Renaud *vice* Mr. H. O.K. Webber.

Gold Output.—The output of gold for the Transvaal for the month of February has been declared at 703,866 fine ozs., valued at £2,989,832, being a decrease of £140,998, as compared with the previous month. Your Committee have decided to publish in future the actual output of each mine (excluding transfers to or from reserves, if any) as well as the declared output which is at present published. The total of the actual outputs of the mines will be the monthly output as declared by the Chamber.

South-Western Exploration Co.

The South-Western Exploration Company, Ltd., reports an idle year. The total expenditure for boring and other prospecting expenses, option rents and claim licences amounted to £8,928 0s. 4d. for the twelve months. When the funds of the company became exhausted arrangements were made with Messrs. A. Goerz Co., Ltd., under which they agreed to make advances to the company at their discretion, bearing interest at the rate of 7 per cent. per annum, and the advances thus obtained amounted to £4,498 17s. 3d. on 31st December, 1911. All boring operations were stopped in June, 1911, and no other prospecting work has been conducted since. The receipts and expenditure statement shows that the nett expenditure during the past year amounted to £10,001 14s. 4d., made up as follows: Boring and other prospecting expenses, options and rents, licences and mynpacht dues, £8,928; core boxes, £11; interest, £172; administration expenses (including directors', auditors' and London agency fees, and head and London office expenses), £1,079; less amount received for buildings, etc., sold, £190; total, £10,001. The profit and loss account for the year shows: Administration expenses, £1,079; interest, £172; depreciation of shares held in other concerns, £1,918; total, £3,170. This amount has been carried to the balance sheet. When prospecting operations were stopped, arrangements were made whereby the directors, London Committee, secretary and London secretary have continued their services at nominal fees.

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THE AURORA WEST UNITED IN 1911.

New Share Issue Still in Abeyance—Gross Profit £30,466—Full Number of Stamps to Drop Next Month.

The total revenue of the Aurora West United for the year amounted to £158,003 16s. 2d., and the working expenditure to £127,537 4s. 11d., leaving a gross profit of £30,466 11s. 3d. After adding the credit balance of appropriation account of £18,849 11s. 2d. brought forward from the previous year, and providing for interest on temporary loans and profits tax, the balance of unappropriated profit, amounting to £36,453 19s. 10d., has been carried forward to the new year. The financial position at the date the accounts were made up was as follows:—Liabilities: Temporary loans from the General Mining and Finance Corporation, Ltd., with accrued interest, £164,241; sundry creditors, £9,607; profits tax for the year 1911 (estimated), £1,017; bills payable, £6,000; total, £180,866. Liquid assets: Stores, £4,167; sundry shares, £219; payments in advance, £945; sundry debtors, £1,627; cash, £11,004; total, £17,964; excess of liabilities over liquid assets, £162,902. The directors state that owing to the general depression which has prevailed during the year, it has not been possible to submit to shareholders a satisfactory scheme for the capitalisation of the company's indebtedness to the General Mining and Finance Corporation, Limited. The mill of 60 stamps ran 342·069 days, and crushed 131,359 tons of ore, yielding gold, etc., to the value of £156,943 18s. 10d., or 23s. 10·744 per ton, and the working expenditure amounted to £127,537 4s. 11d., equal to 19s. 5·017 per ton, leaving a profit on mining operations of £29,406 13s. 11d., or 4s. 5·727 per ton.

Ore Reserves.

The manager estimates the payable ore in sight at 345,578 milling tons, of an average value of 5·85 dwts. per ton over a stoping width of 36 inches. In addition, there are in suspense partially exposed but not immediately available for stoping 69,064 milling tons of an estimated value of 6·81 dwts. over 36 inches. During the year 20 new stamps were erected, making 80 in all. Part of the mill consists of 40 old stamps, and these are being overhauled and placed on new foundations. This work will be completed in April next. The sands and slimes plant has also been augmented in order to bring its capacity up to that of the full mill. The main shaft was sunk and timbered a further 220 feet.

Manager's Report

The Manager, Mr. J. P. Ward, writes, *inter alia*:—Mill and cyanide plant.—During the year 20 stamps were added to the existing mill, and the full mill of eighty stamps was at work 15.3 days. The sands plant has been augmented by two vats—one settling and one treatment vat—and the slimes plant by six vats—one primary settler and five treatment vats—also one additional sludge pump. The above plant brings our capacity up to that required for handling the increased tonnage. In the meantime we are treating a larger tonnage, up to 1,000 tons per month, of accumulated slimes, until the 80 stamps are running. The old 40 stamps are being pulled out and re-erected on new foundations, it having been found that the pile blocks under these are completely decayed. After completion of this repair work, the crushing capacity of the mill will be up to 15,000 tons per month. Shaft engine and boiler plant.—Three old Hornsby boilers, each 100 h.p., were condemned by the Government Machinery Inspector during the year, and dismantled. One Stirling boiler of 250 h.p. was added to our plant. A "Willans" engine and generator of 100 k.w. capacity was erected as a stand-by. The 15 drill "Walker" compressor has had the h.p. cylinder bored out, giving this machine the necessary steam power to drive it and raising its capacity to 20 drills; heavy repairs have also been carried out on the "Sentinel" compressor. Workshops.—The capacity of the drill shop at the shaft has been doubled to enable all machine steel to be sharpened at the shaft. Buildings.—All buildings on the property have been overhauled and painted throughout. This exceptional maintenance charge on working costs, amounting to £1,500 for the year, should not fall so heavily in future. Main shaft.—The angle-iron guides in the vertical shaft have been replaced by heavier guides and stiffened throughout. The main shaft has been sunk and timbered 219½ feet. A total development of 10,570.5 feet has been accomplished in:—South reef, 3,555.5 drives, Main Reef Leader, 2,295 drives, total drives 5,850.5 drives; total cross-cuts 324.5; South Reef 1,565 raises, Main Reef Leader 774 raises, total raises, 2,339; South Reef, 1,213 winzes, Main Reef Leader 843.5 winzes, total winzes 2,056.5; total 10,570.5. The payable ore reserves fully developed and ready for stoping amount to:—South Reef: milling tons 201,343, Main Reef Leader milling tons, 144,235, total milling tons 345,578; South reef value 6.01, Main Reef Leader value 5.63, total values 5.85; milling width, South Reef, 36 inches, Main Reef Leader milling width 36 inches, total milling width 36 inches. In addition to the above there are in suspense, partially exposed, but not immediately available for stoping:—South Reef, milling tons, 39,854, Main Reef Leader milling tons, 29,210, total milling tons, 69,064; estimated value: South Reef, 6.25, Main Reef Leader, 7.57, total estimated values, 6.81; total milling widths 36 ins., the values of which are expected to be fully equal to that reported as fully developed. Mining.—The total tonnage of ore mined during the year amounted to 156,530 tons, of which 25,344 tons, or 16.191 per cent. was discarded as waste. The percentage of ore stoped from the various reefs is as follows, viz.:—South Reef, 62,418 tons, 39.876 per cent.; Main Reef Leader, 51,406 tons, 32.841 per cent.; Main Reef and M.R. Leader, 22,322 tons, 14.261 per cent.; development, 20,155 tons, 12.876 per cent; surface dump, 229 tons, .146 per cent.; total tons, 156,530, total percentage, 100.000. The total cost of mining amounted to £62,506 1s. 8d., i.e., 9/6.202 per ton milled, or 7/11.837 per ton mined. The efficiency in machine work has been maintained, and in hand drilling a considerable improvement has been effected, but owing to the higher cost of native labour, the costs have been increased in advance of this improvement in efficiency. Ore sorting, crushing and transport.—The expenditure under this heading amounted to £3,172 10s., for 163,695 tons handled, i.e., 5.796d. per ton milled, or 4.651d. per ton handled. The cost during 1910 amounted to 10.095d. per ton milled, the reduction being due the new mechanical haulage to the mill bins. Milling.—As already mentioned the erection of an additional 20 stamps was completed in September, making a total of 80 stamps, of which only 60 are in use at present. The full number of stamps will again be dropped in April, 1912, after the repairs to the old mill will have been completed. During the year 60 stamps ran 342.069 days crushing 131,359 tons of ore, showing an average stamp duty of 6.389 tons per 24 hours. The working costs under this heading amount to £12,722 6s. 7d., or 1/11.244 per ton milled, as against 2/0.286 during the previous year. The total yield from this source was 25,615.702 ounces of fine gold valued at £108,402 15s. 11d. equal to 16/6.057 per ton milled, the recovery from the mill being 3.9 dwts. per ton. The percentage of the total yield from all sources recovered by amalgamation was 69.073 per cent. Cyaniding.—During the year 92,548 tons of sands and 41,090 tons of slimes, making a total of 133,638 tons were treated, at a cost of £12,256 18s. 8d., i.e., 1/10.394 per ton milled or 1/10.012 per ton treated. The yield from this source amounted to 11,487.482 ounces fine gold, of a value of £48,451 2s. 11d. equal to 7/4.687 per ton milled. The recovery per ton milled being 1.749 dwts. The percentage of the total yield from all sources recovered by cyaniding was 30.927 per cent. The average value of the residues was as follows:—Sands .585, slimes .212, average .471 dwts. During the year 2,362 tons of accumulated slimes were treated at a cost of £320 10s. 4d., i.e., 2/8.567 per ton treated, yielding 145.834 ounces of fine gold. The actual gold recovered from all sources was 37,103.184 ounces fine, valued at £156,943 18s. 10d., i.e., 23/10.744 per ton milled. Costs and profits.—The total revenue for the year, including "Sundry Revenue" from rents and sale of old material, amounted to £158,003 16s. 2d., of which the amount of £127,537 4s. 11d. was absorbed by "Working costs," leaving a profit of £30,466 11s. 3d., equal to 4/7.664 per ton milled. Native labour.—Although the year's results are on the whole satisfactory, the outcome would have been more favourable had it not been for the keen competition in the native labour market, which made it necessary for us to offer increased rates of pay, and employ every possible means of obtaining labour. This affected the "working profits" adversely.

A correspondent of the "Ladybrand Courant" writes: Marquard is becoming a centre of very great importance. We are told that we have here the biggest diamond mine in South Africa! Prospecting is going strong. Mr. Appleby, formerly of the Monastery Mine, is highly satisfied with the prospects. Various expert people were here to have a look round, and there has been quite a bustle and commotion in connection with this big mine.

Pongola Activity.

The first five of the 10-stamp battery of the Klipwal-Pongola, Ltd., commenced experimental crushing on March 5, preparatory to regular and continuous running, which will be begun about March 20. The Wonder battery was also restarted during last week.

THE RELATION BETWEEN PHTHISIS AND ACCIDENTS.

Incompetence Caused by Phthisis and the Cause of the High Accident Rate.

At the Chemical, Metallurgical and Mining Society's meeting on Saturday night, Mr. Richard A. Barry made a contribution to the discussion on accidents in the Transvaal mines. During the course of his notes he said: We are all sadly aware of the fact that our accident rate is very high—how high in comparison with other countries which enjoy different conditions appears to me to be most difficult to arrive at. To reach a fair basis of comparison would need a much closer investigation into the conditions prevailing in each separate country than appears to me to have been entered into. Coal and metal mining are admittedly in quite different categories when considering accidents. Skilled and unskilled white employes also should each have their separate divisions, and whether such men were actually conducting their own operations and therefore were more or less limited to the risks which they themselves could control in some sort, or whether they were in charge of gangs of workers, and if so to what degree of intelligence and training such workers had attained, are points which, I think, should be stated before attempting to throw the onus on mining conduct. That accidents, with a force of highly intelligent beings such as the Chinese proved themselves to be, could be far better kept in check than, with the continuously shifting hordes of savages which it is mostly our unhappy fate to handle nowadays, there can be no argument. I think that ill-considered comparisons can only do harm through laying a misleading idea before the world and thus tending to drive workers away from us and into other fields, workers whose energy and brains our own industry can ill afford to dispense with. Figures have been adduced to prove that the number of changes which occur constantly on all our mines amongst our white labour force is inordinately high, and again further figures have been brought to show that where such changes occur most, there the accident rate has been highest, and what looks perhaps like obvious deduction has been made from these facts—i.e., that our accident rate is largely due to our unfortunate system of moving men on so frequently. Stop changing your men, they say, and you will largely decrease your accidents.

Phthisis the Cause.

Now, I hold that we must look much deeper for the root of the trouble. It is admitted by all who look into the matter that the hope of arresting the flux and efflux of our coloured labour force has no place in practical politics to-day, so that some 85 per cent. of your underground labour force is doomed to a perpetual flow, for reasons outside our control, and though, if we could secure more staple conditions amongst the balance of the underground labour force (the 15 per cent represented by the white workers), we should undoubtedly achieve something; yet see what a vast field of impossibility still faces you, after achieving this small but difficult part of your task. But apart from the unapproachable field and dealing only with the white labour force—the controllable 15 per cent. of the underground force—I would contend that you must look deeper than the mere shifting of our workers from mine to mine for your accident rate. Why do they shift? No manager ever moves a man on just for the fun of the thing, but he is ever anxious to keep any man who has any pretensions to being a good miner, though alas! the percentage of such men amongst the underground hands is by no means what it should be. A certain number of underground hands are absolutely necessary in each mine, and therefore after getting as many good miners as possible, the balance of the force has to be made up with the next best available, and it is this balance which the manager is ever trying to replace with better men. The fact is there are not enough miners to go round; good men can pick and choose and move about in the most extraordinary way to suit any whim they may have, for billets are always obtainable; whilst poor miners are for ever being turned over by one mine after another in the search for the unobtainable. Hence it follows that mines most favourably situated, or which have the best and nicest conditions get the first pick of the good miners and show the steadiest labour force, whilst those with bad working conditions find themselves left with the residue. Let the ground be a bit too steep, a bit wet, or the least bit difficult, and you find at once that your best miner shuns it, telling you quite candidly that at such and such a mine he can make the same money with much less discomfort and hard work, so why should he stay with you.

Lack of Good Men.

The inevitable result of this very natural process of selection is that the most difficult mines, which call for the best class of men, get left with the poorest selection, and up goes their accident rate; they change and change in their effort to get better men, and your statistician is led to the belief that the trouble is due to the rate of change. He is sadly mistaken. The trouble is due to the fact that there are not enough good men to go round, or anything like it, and the rate of change and the rate of accident are chiefly due to this fact. Every mine on the Rand is affected by this scarcity of good men, and to my mind the industry is as hard, if not harder, hit by the scarcity of really skilled white underground workers as it is by the much more generally recognised scarcity of unskilled labourers. And to what is this scarcity attributable? There can be but one answer—miners' phthisis. This hits at the root of everything. Miners' phthisis is destroying our best miners just when they are reaching the point when they are most valuable to the industry. After seven or eight years underground there are but few, if any, who come out untainted with this dread disease. We should by this time have a reservoir of good experienced men from which to draw—men who have good experience here and have decided to make this country their home—but what do we find in the reservoir after all these years during which our mining industry has been going—nothing but miners' phthisis. It hits us in every direction. We must pay bigger wages to try and blind men to the risk which they take. We get inefficiency in most of our underground work despite our tremendous wages. We find our Rand filled with miners who don't mean to make the country their home, but only come to snatch what they can from the jaws of disease, and we find the very heavy accident rate under which we labour and which we try to attribute to a hundred and one things, but which lies really at the door of phthisis—a door, mark you, which can closed if the effort be made.

REVIEW.

"REVUE ECONOMIQUE INTERNATIONALE."

The current number of the above magazine is a South African number devoted to a comprehensive survey of the leading South African questions. The articles are contributed by local specialists. One of the principal essays—South African politics—is written by M. Pierre Forthomme, Consul-General for Belgium in Johannesburg, who has had much to do with the compilation of the volume. M. Forthomme says: The three main questions are language, native policy, and immigration. With regard to the first he inclines to the view that the English language, from its superiority for political and every other purpose, will ultimately prevail. The disquieting problem of the rapid increase of the native as against the slow-growing European population, M. Forthomme thinks, can only be balanced by a progressive immigration policy. After reviewing the various suggestions brought forward to deal with this question, M. Forthomme comes to the conclusion "that in the present case it is better far to profit from the lessons of experience, and conclude that if the United States and other countries have been populated rapidly by European immigration, there is no essential reason why South Africa should not be populated in the same way in the proportions according to the forms that its special circumstances may determine." He concludes as follows: "National defence, exterior relations, the native menace, the creation of new industries, the language question, the supremacy over the rest of Africa—all these will settle themselves in one way or another, according to the extent to which the current of immigration will be encouraged or retarded. The numbers which will be reached by the population of European origin within the next twenty-five years will determine the role which the Union of South Africa will play in the affairs of the Empire and in the history of the world"

Rooipan Discoverer's Rights.

Mr. William Seymour Smythe, of Klerkskraal, Potchefstroom, has been awarded 50 claims as an award in respect of reef gold upon the farm Rooipan, Potchefstroom, in the Klerksdorp mining district.

Barkly West Commonage Proclaimed.

Mr. John Miller, the President of the Vaal River Diggers' Union, has received a wire from the Minister for Mines to the effect that the whole of the Barkly West Commonage will be proclaimed an alluvial diggings at an early date. There is a very large area of unproclaimed alluvial ground on the Barkly Commonage, a great portion of which, according to prospectors, is very rich.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' Examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings, Box 2061, Johannesburg.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Sheba Redivivus.

To the Editor, *South African Mining Journal.*

Sir,—Can you or any of your readers tell me why a section of the local Press has recently begun to "boom" the Sheba? Who controls it? Are the shares quoted? Are they about to be? Is yet another reconstruction scheme afoot?—Yours, etc.,

"INQUISITIVE."

[Messrs. Lewis & Marks control the company. The answers to the other questions are in the negative.—Ed. *S.A.M.J.*]

Tube Mills and Mines Trials Committee.

To the Editor, *South African Mining Journal.*

Sir,—May I ask you to draw attention to the appeal made by Mr. Alfred James last Saturday night to the Mines Trials Committee to take up the closer investigation of tube mill questions. Your own columns have already contained similar appeals in the past.—Yours, etc.,

"AMALGAMATOR."

[The appeal in question is quoted elsewhere in this issue, and, needless to state, we cordially endorse it.—Ed. *S.A.M.J.*]

Rand Auditors' "Independence."

To the Editor, *South African Mining Journal.*

Sir,—With reference to the discussion that has been going on in your columns on the duties and responsibilities of auditors, there are two questions that I, as an ordinary small shareholder, wish to ask. The first is why nearly all the auditing of Rand companies is split up among a few firms, honest and long-established, no doubt, but still very limited in number? The second is, why the auditors do not come forward and reply to Mr. Pott's attack on their "independence," which is another way of questioning their honesty. Doctors and lawyers are not slow to defend the good name of their respective professions, when attacked. If our auditors take Mr. Pott's strictures lying down, people will draw their own conclusions.—Yours, etc.,

"SHAREHOLDER."

A New Fumes Destroyer.

To the Editor, *South African Mining Journal.*

Sir,—There have been so many plans lately for destroying fumes, when blasting in mines, that I feel afraid to say anything even now, after witnessing a great success in a new departure from the old ones, where sprays, respirators, etc., have and do yet monopolise the minds of men sworn to annihilate the "fumes demon." I will give a brief account of what I saw recently regarding a new "fumes destroyer." A shaft and drive were used for the test. A hole was bored and charged with dynamite at end of said drive, and charge lighted by fuse in usual way. When all was ready and blast completed, time was called, and from the time of the explosion to the exit of fumes from shaft and drive, so as to be able to descend into same, three hours elapsed. A second hole to try the new process was then bored at the end of the same drive and charged with the same amount of dynamite as the first hole. From the time of explosion to the descent into shaft and drive only ten minutes elapsed, thus beating the old system by over two and three-quarter hours. I was so far convinced as to the efficiency of this new plan that I will now undertake to clear of fumes, after blasting, any shaft of, say, 20 feet and drive of same length, in ten minutes, although the time generally taken is three hours.—Yours, etc.,

FRED. B. BOWYER.

[Mr. Bowyer seems to overlook the fact that other fume-killers have been introduced with some success, notably that invented by one Walker, which was, however, rejected by the Mines Trials Committee.—Ed.]

Weighing Ore by Electricity.

To the Editor, *South African Mining Journal.*

Sir,—In view of the letter on "Ore Weighing" that appeared in a recent issue of your paper, may I bring to your attention an interesting application of electricity to the weighing of materials in motion on conveyors recently made at the plant of the Steptoe Valley Smelting and Mining Company, of McGill, Nevada. This installation is by the Electric Weighing Company, of New York, under the Messiter patents. It is claimed that it weighs materials while in motion as accurately as stationary scales. It does not require an operator to control it, but indicates and records the weight. The process adopted is to determine at any instant the weight of a definite length of the moving stream of material which is being handled, and also the speed at which that stream is travelling. The total weight passing a point in a given interval of time can be thus determined in terms of the product of the speed of motion and the average weight of a given length of stream. This can be expressed in electrical terms. Electro-motive force can be developed in strict proportion to the speed of the stream of material, and the resistance of an electric circuit can be made to vary inversely at any instant. Thus the quantity of electricity flowing in an electric circuit, controlled in such a manner, would be accurately in proportion to the weight of material discharged by the conveyor in the time considered. The apparatus contains an electric generator run at variable speeds and so constructed that the electro-motive force produced is strictly proportional to the speed. This is secured by making the field absolutely constant by the use of permanent steel magnets, properly aged so that their flux will not vary. Under such conditions the rate of cutting of the field by the conductors of the armature is strictly proportional to the speed of rotation of the generator, and neglecting the effect of armature reaction and internal resistance, it will be seen that the terminal voltage of the generator will be strictly proportional to this speed. If such a dynamo, therefore, be attached to the pulley system of the conveyor, this electro-motive force will be a measure of the speed of the belt. A portion of the loaded or carrying part of the conveyor and a portion of the return or unloaded part are suspended from scale beams in such a way that the weight of the unloaded part at any instant offsets the weight of the loaded part. In this way the scale is self-balancing, and any influence of sticking material, moisture or wear on the belt is automatically compensated for. The lever scale beams, mounted on knife edges, control a resistance placed in the dynamo circuit, consisting of a considerable number of wire loops placed in narrow compartments at the sides of the weigher. Each loop is attached to a platinum contact point inserted in a vessel which contains mercury, the level of which is changed by the action of a cylindrical plunger which partly floats in the mercury. As the position of the scale levers alters correspondingly to the changes of weight on the portion of the belt measured, this plunger, which forms the counterpoise of the scale, varies its position and this affects the level of the mercury in the vessel. The dynamo circuit is connected into the lowest portion of the mercury, and leaves it at its top level as determined by the highest contact point which happens at the time to be below the surface of the mercury. Thus varying portions of the total resistance are short-circuited according to the weight of the material on the belt at any instant. On the top of the mercury, in a bell-shaped extension of the mercury vessel, is a layer of oil which not only protects the mercury surface from the air, preventing oxidation, but also catches any dust which may possibly find its way to the mercury vessel. In order to further protect the appliance from dust, the generator is completely enclosed. In order to register the indications of this weigher a recording ampere-hour meter is used, the dial being calibrated directly in terms of weight. This meter, which totals the weighing continuously, is connected in series with the generator and the rheostat, and by using an auxiliary circuit operated from a battery or other supply source, it is possible to operate indicating and recording instruments at a distance from the actual weigher, thus facilitating the use of a check instrument in the superintendent's office or similar suitable location. The possibility of the application of the idea on the Rand is obvious.—Yours, etc.,

" ELECTRICAL ENGINEER."

ANSWERS TO CORRESPONDENTS.

" W. B."—Your query should be sent to the Government Mining Engineer, who will, no doubt, give you all the desired information.

" C. O." (Makwiro).—The Secretary, c/o Messrs. Lewis & Marks, will find the company.

" Concession."—Enquiries are being made, but we believe the concession has already been given out.

" X.Y.Z."—Your letter appears to be libellous.

" Concessionaire."—Enquiries are being made, but it is almost certain that the concession has already been granted.

THE FERREIRA MAKES ITS FINAL REPORT.

Fewer Stope Faces and Decreased Tonnage Reduce the Grade and Send Up Working Costs.

In 1911 the Ferreira earned a net profit of £206,261 11s. 2d., making, together with unappropriated balance brought forward from last year, £159,571 5s. and £4,934 15s. 7d.—credit on capital expenditure account—a total of £370,767 11s. 9d. This sum has been dealt with as follows:—Government tax on profits, £14,709 2s.; dividends Nos. 35 and 36, £190,000; balance carried to balance sheet, £166,058 9s. 9d. As the stope faces become exhausted and the tonnage decreases, so the working conditions become less and less favourable; this is evidenced by the decrease in grade and increase in working costs over last year's operations. Since the close of the financial year an offer has been received from the Ferreira Deep, Limited, for the amalgamation of the two companies. This proposal, which provides for the sale of the assets of this company to the Ferreira Deep, Ltd., has been accepted by the directors, subject to confirmation by shareholders.

Consulting Engineer's Report.

The Consulting Engineer, Mr. Ferey Cazalet, writes:—The operations of your company for the year, as advised would be the case in last year's report, show considerable shortfall when compared with those of the previous year, the tonnage mined showing a reduction of 50,093 tons, and that milled one of 35,850 tons, while the quantity of waste sorted on the surface also decreased by 2.3 per cent.; a large amount of additional waste, however, was sorted and packed underground for stope support. The declared yield per ton (excluding accumulations) at 27s. 10.7d. shows a decrease of 4s. 8.6d. as compared with 1910, and the costs an increase of about 10d. per ton. A large amount of ore, viz., 116,000 tons, of a mine value of 6.7 dwts., was obtained from sweepings and by turning over and sorting out the reef in stope packs, this tonnage of lower value accounting for most of the drop in grade. A very small tonnage of block ground now remains, and the bulk of the ore must in future be obtained from pillars, sweepings and the remaining reef packs in in the stopes. The packs have been almost exhausted in the wider stopes of the western section of the mine, only those in the narrow stopes of the eastern section now remaining. The operating results of the past three years are as follows:—

	1909.	1910.	1911.
Tons milled	339,150	346,150	310,300
Working revenue... ...	£685,843	£579,473*	£453,712*
Working expenditure	£262,636	£278,399*	£264,249*
Working profit ...	£423,207	£301,074*	£189,462*

*Including accumulations.

1,570 ounces of gold were placed to reserve during the year, the value of the gold now in reserve being £8,262 13s. 9d. The total payable ore reserves have been re-estimated as at 31st December, 1911, as follows:—Main Reef, 2,524 tons, 6.00 dwts., 67 estimated S.W. inches; Main Reef and Leader, 162,577 tons, 7.53 dwts., 110 estimated S.W. inches; Leader, 104,791 tons, 8.12 dwts., 68 estimated S.W. inches; South Reef, 51,708 tons, 10.02 dwts., 59 estimated S.W. inches. Total and average, 324,603 tons, 8.13 dwts., 81 estimated S.W. inches. Of the above total 146,645 tons are in blocked ground, the remainder consisting of pillars, including shaft and boundary pillars. This total compares with 598,671 at 8.10 dwts. at 31st December, 1910. In addition to the above ore reserves it is estimated that there are some 25,000 tons of a value of 6.7 dwts. of ore broken and packed in the narrow stopes, of the eastern section of the mine, and used to support the hanging wall, which are now in process of being recovered, while it is probable that some further ore may be recovered from sweepings, etc. There are also 55,869 tons of unpayable ore standing developed in the mine. The development of the mine is now completed, some blocks of Main Reef, in which it was hoped to find payable values, having been proved unpayable during the year. Owing to the block ground nearing exhaustion, and in consequence the number of stope faces becoming smaller, it will not in future be possible to keep the same number of stamps running as heretofore, and therefore greatly decreased tonnages and profits must be looked for during the coming year, with an increase in the cost per ton milled.

Manager's Report.

The Manager, Mr. Palmer Carter, writes, *inter alia*:—Mine—The underground operations comprise the following:—Stoping, etc.—Stoping was carried on in the Main Reef on the 6th, 8th, and 9th levels, in the Main Reef and Leader on the 1st, 2nd, 3rd, 4th, 11th, and 17th levels, in the Leader on the 3rd, 5th, 6th, 7th, 9th, 11th, 13th and 17th levels, and in the South Reef on the 9th, 11th, 13th, 15th, and 17th levels, resulting in a total of 336,757 tons, to which can be added the ore obtained from developing faces, making a total of 340,433 tons mined, of which 13,824 tons (4 per cent.) were from the Main Reef, 152,785 tons (45 per cent.) were from the Main Reef and Leader, 77,739 tons (23 per cent.) were from the Leader, 96,085 tons (28 per cent.) were from the South Reef. The stoping widths in these reefs averaged respectively 70 inches, 84 inches, 58 inches, and 55 inches. The development operations resulted in the following footages:—Drives, 586 feet; winzes and raises, 456 feet; crosscuts, 148 feet. Total, 1,190 feet. Of the above footage 1,042 feet, or about 88 per cent., was in reef formation, the reef disclosures in which were as follows:—Main Reef—Distance exposed 414 feet, width 29 inches, assay value 4.4 dwts; Main Reef and Leader—Distance exposed 489 feet, width 29 inches, assay value 5.6 dwts.; Leader—Distance exposed 89 feet, width 52 inches, assay value 4.6 dwts.; South Reef—Distance exposed 50 feet, width 26 inches, assay value 55.5 dwts. The estimated tonnage of ore exposed by drives and stoping in undeveloped ground, all of which was unpayable, was as follows:—Main Reef, 15,425 tons. Ore reserves.—The payable ore reserves at 31st December, 1911, were estimated as follows: Main Reef, 2,524 tons; Main Reef and Leader, 162,577 tons; Leader, 101,794 tons; South Reef, 54,708 tons. Total, 324,603 tons. During the year the " Pack System " in stopes was continued and 26,291 tons of reef and waste were packed. Robbing the packs from worked out areas has been carried on throughout the year, and 49,753 tons, value 7.51 dwts., was obtained from this source. The whole of the building, machinery, plant, etc., have been maintained in a thorough state of repair.

The Daisy Mine.

Mr. Howard Hill has acquired the Daisy mill and Harewood claims in the Barberton district.

Rhodesian Section.

LATEST MINING NEWS FROM THE SOUTHERN AND NORTHERN TERRITORIES.

Pessimism and Development—Reports of Several Mines Examined—Water Shortage—Giant Returns—A Mining Law for the North—Activity in Northern Rhodesia and the Congo.

PESSIMISM seems to be the prevailing note in certain Rhodesian circles at present. The feeling of despondency has, no doubt, been largely brought about by the withdrawal of certain important Rand firms from the field of Rhodesian activity—firms like Messrs. S. Neumann and Co., A. Goerz and Co., the General Mining and Finance Corporation, and Sir Abe Bailey. The public, too, despite all that has been said and written to the contrary, insist on the fact that, despite all the glowing reports circulated a year or two ago, the output of the country is not increasing. That development is progressing at a greater rate than ever previously is an important—a most important—bull point, but it is largely lost sight of, and it is urged that Rhodesia has not fulfilled expectations in the matter of production. Then again, the unsatisfactory rumours which have been afloat regarding recent developments in some of the most important mines of the country have very naturally further tended to depress matters.

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It should here be of interest, therefore, to afford some space to an examination of recent development operations as disclosed in the latest reports published. The Eldorado has come in for a great deal of adverse criticism and unfavourable report since the beginning of the year, and the following information which was cabled from Bulawayo. on the 9th inst., to the London office of the Eldorado Banket G.M. Co., Ltd., is thus of special interest:—The main reef on this property has now been cut at two points on the 9th level, the latest assay giving the satisfactory result of 32 dwts. over 60 ins. As to the Shamva, the following is a copy of a cable which was despatched to the London office of the Shamva Mines. Ltd., on the 11th inst.:—No. 8 Level.—Cross-cut No. 3 has so far exposed 60 ft. of reef. From 50 to 55 feet the reef assays over 2 ozs. per ton, whilst the average assay value over 60 ft. is 14 dwts. unreduced, and 6·7 dwts. reduced; reef continuing. In cutting chamber for winze to the 4th level a good deal of visible gold was encountered. " Next to the Shamva, the Cam and Motor mines near Gatooma have a larger tonnage blocked out than any other mines in the country. The summary of a report despatched by the last mail regarding this concern is as follows:—Motor Mine: No. 3 level rises: 100 ft. north of No. 1 shaft now up 30 feet. Values average 26·4 dwts. over 50 ins. No. 3 level cross-cuts: Average value over total pay-section at cross-cut 105 ft. north is 7·1 dwts., over 15 ft. 2 ins. No. 4 level: Main south drive advanced further 44 ft. Total 416 ft. south of No. 1 shaft, cross-cut east at 300 ft. north of No. 1 shaft extended a further 7 ft., total width, 102 ft.—values over last 10 ft. 6 ins. of width average 15·6 dwts.—face still in values. Rise 300 ft. north of No. 1 shaft, footage 43 ft., values average 7·8 dwts. over 35 ins. As to the Falcon, a cable from the mine manager, dated February 12th, reads:—" Shaft No. 9. No. 4 level main drive east, No. 8 cross-cut south, from 27 to 32 ft., assay value £2 0s. 9d. per ton. No. 5 level main drive east, No. 1 cross-cut south, from 57 to 62 ft., assay value £3 1s. per ton. Winze No. 1, at a depth of 35 ft., assay value £4 2s. 6d. per ton." At the Lonely the following are the results of development work carried out during January:—No. 6 level south drive 420 to 435 ft., average width is 28·66 ins., average value is 1 oz. 6 dwts. No. 7 level south drive 390 to 470 ft., average width is 29·56 ins., average value 15 dwts. Winze No. 1 (from No. 7 level) 55 to 70 ft., average width of reef is 40 ins., average value, 3 ozs., 14 dwts., not all exposed. No. 8 level, commenced to cross-cut from shaft end of January, 30 ft. in up to date. Head office note: " Including the above figures, the development of the ore shute on the 6th level now stands at 740 ft., having an average value of 29·3 dwts. for an average width of 40 ins.; and on the 7th level it stands at 680 ft., having an average value of 37·8 dwts. for an average width of 52·2 ins. The south drives of both levels are being continued in good ore. Owing to a temporary breakdown of one of the tube mills the crushing is not proceeding at full capacity. Steps have already been taken for the immediate repair of the broken part." Another venture at which development is being pushed on with is the Gaika.

Of this mine the mine manager's report for December, dated January 16th, gives the following particulars of development: North Section. North shaft No. 4 level drive north driven 10 ft., a total of 69 ft. from the winze. The section 56 ft.—65 ft. assayed 6.4 dwts. over 48 ins. No. 5 level drive north driven 31 ft. The section sampled (131 ft.—155 ft.) assays an average of 24 dwts. over 48 ins. No. 5 level drive south driven 28 ft. The section sampled (101 ft.—120 ft.) assayed 29.8 dwts. over 54 ins. No. 6 level drive north driven 30 ft. Exceptionally high values have been exposed, the last 10ft. assaying 100 dwts. per ton over a width of 72 ins. These are reduced values. The section sampled (111 ft.—140 ft.) assayed 45.7 dwts. over a width of 72 ins. No. 6 level winze 1 sunk 23 ft. The average value for the period 41ft.—65 ft. is 7.7 dwts. over 48 ins. No. 7 level drive north driven 23 ft.

Taken on the whole, the developments reflected in the above may be deemed quite satisfactory, and they should be recognised as such by those who are for ever condemning the country and its future.

* * * *

The scarcity of water is becoming a serious matter in the Midland district. The Yankee Doodle, the Don, and the Sheba-Bongola mines have been forced to close down for want of water. The Yankee Doodle is now laying pipes down from the Tebekwe river several miles away. Several of the mines, owing to curtailed operations, have had to dispense with much white labour, the prospects for which are not too happy since, with the water trouble solved, some of the properties are bound to be affected by the high cost of mealies which is threatened.

* * * *

The following extracts are taken from the report of the Giant Mines of Rhodesia, Limited, for the quarter ended 31st December:—Driven, sunk and risen, 431 ft.; ore developed at 1st October, 274.795 tons: ore developed during period 1st October to 31st December, 27.565 tons—302,360 tons. Ore crushed, 32,326 tons; ore in sight at 31st December, 270,000 tons. Yield in fine gold from mill, 13,041 ozs.; yield per ton treated, 8.059 dwts.; cost per ton crushed, 14s. 6.733d.: estimated working profit, £31,764, or 19s. 7.581d. per ton; capital expenditure, £3.633. In connection with the mine, the London office has issued the following:—" Owing to numerous enquiries from shareholders, the board have cabled to the mine to ask whether everything is running smoothly. The reply to hand is as follows: Everything running very satisfactorily here."

* * * *

As already announced, Mr. R. T. Bayliss intends proceeding shortly to Rhodesia in connection with the important interests to which he has already become attached, namely, the British South Africa Mines Development Company. His presence there, says the *Mining World*, cannot fail to be of all-round benefit. He, however, takes a very modest view of the services he is likely to render. He is not proceeding to Rhodesia "with any idea of teaching men who have been working there so long and so well how to carry on mining operations," but he is ready to place at their disposal the experience he has gained in mining during a long course of mining, which, it may be said, has been of much benefit to investors in the past. Some of the best Mexican mines of the day owe no inconsiderable part of their success to the timely action of Mr. Bayliss. Mr. Bayliss, while placing his unique mining knowledge at the disposal of the Chartered Development Company, does not relinquish the chairmanship of the Exploration Company, which has large interests in Mexico and elsewhere.

* * * *

In regard to Northern Rhodesia, it is important to note that the Chartered Company's last yearly report, just published, states that a mining law for Northern Rhodesia has been approved by the Secretary of State, but it will not come into force until 1st April next in order that those interested may have sufficient warning to comply with the conditions as to pegging, registration, etc., of existing locations, which will be enforced under the law. A mines department has been established, and the terms of the licences to be issued to prospectors have been settled. The organisation of the mining office is in hand; an acting secretary for mines has already been appointed.

* * * *

It is further stated that in the Northern territories during the past year prospecting on a small scale has been carried out by companies holding mining concessions, but no general prospecting has been possible pending the promulgation of the Mining Law. At the Kansanshi Copper Mines a new pumping plant and a new smelter have been installed. Four new traction engines are now running, carrying a load of 22½ tons of copper per trip, and a new road has been made for them from Kansanshi to Nikola Siding, 78½ miles in length. The gold discovered by the Kasempa Gold Mining Company is in pockets, and development is proceeding in order to strike the reef. During last year the Broken Hill Development Company sent 131 tons mixed ores (lead and zinc) to England for experimental purposes, the value of the ores being £655. Nitrates have been discovered by the Northern Copper Company in the south-east of Chilanga Sub-District, Luangwa District. Steam pumps and steam winding gear have been installed at the Bwana Mkubwa mine. A fifth level has been made at a depth of 550 feet, and development work is proceeding. Seven hundred tons of copper ore were sent home for experimental purposes. Development work is proceeding on the Koloko Iron Claims, near Bwana Mkubwa. Saltpetre exists in the Luangwa District, and is made into gunpowder by the natives. The output of the limeworks in the Luangwa District amounted to 1,187 tons, valued at £2,515. The workers report that with more labour the output could have been doubled. The Rhodesia Katanga-Junction Railway and Mineral Company have continued experimental boring, with diamond drills, on their coal property in the Luano Valley. Two thousand tons of copper from the Kansanshi mine, which is now owned by the Rhodesia-Katanga Junction Railway and Mineral Company, Limited, have been shipped to Europe. A smelting plant has been erected at the Sable Antelope mine at which copper from the neighbouring Silver King mine to the estimated value of £51,000 was produced during 1911.

* * * *

Up to the present the Katanga Special Committee has been asked to reserve the exclusive right of further prospecting for 111 different places in the Katanga. Amongst these applications 32 come from the Thys-Jadot Syndicate. Practically one-half of these later discoveries are of gold, and one-half of copper. As to the other 79 applications, they mostly concern copper discoveries.

A Mining Case.

In the High Court, Bulawayo, Messrs. Fripp and Ballard, owners of the Ringstead Mine in the Essexvale district, sued Mr. Devenish, a mining speculator of Barberton, for £2.000 damages for breach of contract, £212 for 90 feet work, and £240, the value of 60 feet work, wrongly used by him for inspection purposes. The plaintiffs contended that Devenish for £500 was given a year's option over the property. If the option was exercised within six months, the purchase price was to be £5,000 and a thousand £1 shares in any company floated, and, if exercised after then, £10,000 cash. A condition of the option was that he should do further sinking and driving on a new level and keep titles afoot at his own expense. Sinking and driving were not carried out, and he declared that 90 feet of the work had been done by the plaintiffs. When inspection fell due, he then abandoned the claims before the agreement lapsed. Judgment was given for the plaintiffs.

The Treatment of Katanga Copper.

A rumour has been current for some time past that the smelting works at Lubumbashi were about to close down for an indeterminate period varying from six to twelve months, says the *Star of the Congo*. We are able to assure our readers that there is no reason to be alarmed, for the Union Miniere has no intention of stopping work for more than a few weeks at most while certain necessary alterations and repairs are in progress. A Commission has been sitting at Brussels to decide whether it would be more advantageous to adopt the American electrical system of extracting copper from ore, or whether they should continue the existing process which necessitates the use of coke. The present process is quite satisfactory so far as the extraction of the copper is concerned, but the difficulty is to procure a continuous supply of the right quality of coke at a reasonable price, and it is a moot point whether the electric system would not prove more economical in the long run, especially as the Government has now put an import tax on coke. The Commission should have arrived at a decision last Tuesday, so we shall probably be able to announce the result of their deliberations in our next issue. In the event of the American system being adopted, an electric plant will be installed at some point on the Lufira River suitable for the purpose—most likely at the falls near Koni Hill. Smelters for the ore from Kambove and more adjacent mines may be built at the Lufira, and the power generated at the electric works will be conducted to Lubumbashi, where the ore from the Star and neighbouring mines will be treated.

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THE TRUTH ABOUT TROPICAL NATIVE MORTALITY.

Misleading Statistics Create Wrong Impressions—A Marked Improvement Shown—Striking Reduction in Death Rate.

The vexed question of tropical natives' mortality was discussed at length by the President of the Chamber of Mines, at the monthly meeting on Thursday. He said, *inter alia*:

The death rate per thousand per annum from disease among these tropical natives was reduced to 38.9 for the month of February. I regret to have to say, however, that the figures which have recently been made public by the Minister for Native Affairs do not appear to reflect the improvement which has taken place during the last few months in the health conditions of the natives hailing from tropical areas. You have been made fully acquainted with the exceptional provisions made to protect the health of these natives, and Mr. O'K. Webber went very fully into the matter at the late annual general meeting. In regard to the published mortality figures it has always seemed to me that these, if made public, would give a most erroneous impression as to the number of deaths which take place among tropical natives. In saying this, however, I do not wish you to infer that I in any way desire to minimise the necessity for the mines taking every possible step to safeguard the health of the natives. I will give you a concrete instance or two of what I mean. During the year 1911 one company which I have in mind had an average number of tropical natives employed of 37.67. This company had the misfortune to lose six boys from disease during that period, and its death rate, according to the ordinary statistical formula, worked out at 159.27 per 1,000 per annum. Now my impression in the past has been that the ordinary man in the street on reading these figures would at once come to the conclusion that the company in question actually lost one hundred and fifty-nine boys during the year. Now let me give you another case in which the company had in its employment the small monthly average number of tropical natives of 8.96 during the same year. This company suffered one death, and its average death rate per 1,000 per annum worked out at 111.6.

Misleading Impression.

The actual position may be very easily grasped by anyone thoroughly acquainted with the way in which these statistics are compiled; but I found that when these figures were given publicity to in the Union Parliament a couple of weeks back the utterly misleading impression of which I was afraid was actually created in the minds of people here generally. The Chamber has made certain representations on this subject to the Minister of Native Affairs, and it is hoped that the Minister will make the actual position clearer before the close of the debate in which the figures were used and which has now been adjourned until the 27th inst. Meanwhile, I would like to call your attention, and the attention of the public, to the particulars of the death rate given by Mr. Drummond Chaplin in the Union Parliament yesterday, in the course of the same debate. One word more on this subject. We have one thousand eight hundred natives from the British Nyasaland Protectorate employed on the mines here, and we had hopeful anticipations of drawing a larger number of mine labourers from the Protectorate. I am glad to be able to say that the death rate among these natives has been very considerably reduced of late, and to inform you that there were only three deaths among them during the month of February. There are other very important aspects of the native labour question with which, however, I do not propose to deal to-day. These matters are having very serious consideration, and I hope to be in a position to give you some information on the general subject before long.

ANGLO-FRENCH (TRANSVAAL) NAVIGATION COAL ESTATES.

The Improved Results Not Reflected in the Profits Earned.

The net profit on coal winning earned by the Anglo-French (Transvaal) Navigation Coal Estates in 1911 amounted to £9,983 8s. 3d., which amount, together with a balance of £6,880 2s. 1d. brought forward from last year, has been appropriated as follows:—Preference dividends, £10,500; amount allocated to provide for extensions to plant, depreciation, etc., £4,500; balance carried forward, £1,863 10s. 4d. The contingent liabilities include accumulated interest on preference shares amounting at the end of the year to £34,629 17s. 3d. This interest is payable before the ordinary shares rank for dividend. The sales amounted to 229,692 tons of marketable coal, or an increase of 61,305 tons as compared with 1910. Owing to the intrusion of stone in the seam and persistent rolls in the floor, the working of the upper seam has been rendered more costly, and the quality of the coal seriously affected. Consequently the profits have not improved with the increased sales. In view of these adverse conditions, it was decided to explore the lower seam, which was known to exist below the present workings. It will be seen from the General Manager's report the results have been encouraging, and if the seam continues to open up satisfactorily, it is intended to transfer all coal winning operations thereto, which should give improved results.

Consulting Engineer's Report.

Mr. E. J. Way, the consulting engineer, writes, *inter alia*:—The principal feature of the year's working has been the very satisfactory nature of the development carried out on what is known as the "lower seam." The opening up of this seam was undertaken owing to the increased working costs resulting from the continued occurrence of "rolls" in the "upper seam," from which practically all the coal mined has been won up to the present time. The "lower seam" has so far proved to be of a workable thickness, and the coal obtained from it to be almost entirely free from waste, and to be of superior calorific value to that obtained from the "upper seam." If this satisfactory development continues, it should result in a reduction in the working costs in the near future. The coal-cutting plant continues to work very well, and the whole of the coal mined is now under-cut by machines. A very satisfactory feature of the year's work is that the increase in output which followed the formation of the new Coal Owners' Association about the middle of 1910 has been well maintained, as is shown by the fact that whereas, after the formation of the above Association the output increased from 10,239 tons per month for the first six months of 1910 to 17,825 tons per month in the last six months of that year, it has in 1911 averaged 19,141 tons per month for the whole year. The erection during the year of a new Lancashire boiler and of a new pumping installation providing a plentiful supply of pure surface water for steaming and domestic purposes completes the surface equipment of your mine. The whole of the surface and underground equipment of your mine has been well maintained.

Manager's Report.

Mr. J. R. Thom, the general manager, writes, *inter alia*:—The mine development is in excess of the previous year, owing to increased output. Figures are attached showing the actual tonnage sold during the year. The development amounts to 4,365 feet, representing an area of 45·24 acres available for mining purposes, which should yield 340.252 tons of clean coal. The total output for the year amounted to 229,692·5 tons of marketable coal. The mechanical haulage has been extended throughout the year as occasion required, so that tramming by manual labour is reduced to a minimum. Fifty of the wooden tubs having worn out have been replaced by steel ones. The coal cutting plant continues to work very well—the whole of our coal is undercut by machines. There are now on the mine 16 Siskol cutters, one New Century cutter, and five "C" type Siskol hammer drills. To enable the mine to obtain a plentiful supply of surface water for steaming and domestic purposes (the mine water being unfit for use), a new pumping station was put down near the old homestead on Elandsfontein farm, from where an unlimited supply can be obtained. The cost of this installation was £1,111 6s. 4d. The result of the year's work so far as output is concerned shows an improvement on the previous year, but unfortunately the profits do not show any improvement. This is accounted for by the reduction in selling prices and the continued occurrence of rolls in the upper seam, entailing extra expense, and adversely affecting quality. Owing to the continued prevalence of these rolls in this seam, it was considered advisable to prove the lower seam. Two drives were put down, and some development done, which has exposed a seam of workable thickness, from which the percentage of sorting will be almost *nil*, and the calorific values, so far, are superior to those obtained from the seam presently worked. The development of this seam is being pushed ahead as rapidly as possible. The total output for the year 1911 was 229,692 tons, as against 168,387 tons for the year 1910.

T.G.M.E. Dividend.

A dividend of 12½ per cent. has been declared by the Transvaal Gold Mining Estates for the half-year ended March 31.

RESULTS FROM THE MAY CONSOLIDATED.

Reduced Profits from Lower Yield—Life of the Mine—Milling Low Grade Ore.

The profits from mining operations earned by the May Consolidated in 1911 amounted to £125,239 15s. 8d. The total value of the yield was 28s. 2·12d. per ton milled, the working cost (including current expenditure on mine development) 14s. 7·18d. per ton milled, leaving a profit of 13s. 6·94d. per ton milled. The yield of gold was:—From the mill, 4·065 dwts. ; from cyaniding, sands, concentrates, and slimes, 2·594 dwts.; total, 6·659 dwts. fine gold per ton milled. The balance brought forward from 1910 amounted to £33,654 14s. 6d.; profit on mining operations in 1911, £125,239 15s. 8d.; revenue from other sources, £3,561 18s. 9d.; total, £162,456 8s. 11d. Against this the following amounts have been charged, viz.: Government tax on profits, £11,515; dividends Nos. 26 and 27 (equal to 40 per cent.), £115,500; French fiscal taxes, £471; contribution *re* Miners' Phthisis Sanatorium, £78; assessment *re* Miners' Phthisis Allowances Fund, £82; donations to charities, £186; depreciation of buildings, reduction works plant and reservoirs, dam and water service, £768; total, £128,602; leaving a balance of £33,853 11s. 3d. to be carried forward to the credit of profit and loss account at the 31st December, 1911. The amount payable by the company in respect of profits tax for the past year is estimated at £11,515.

CONSULTING ENGINEER'S REPORT.

The Consulting Engineer, Mr. W. McC. Cameron, writes, *inter alia:* Details of work done and results obtained are given in your manager's report. The tonnage milled was slightly increased, while the yield decreased by 1s. 6·88d. per ton milled and costs by 3·28d. per ton milled, resulting in a reduction in working profit of £9,301 17s. 11d. for the year. Although the average yield for the year amounted to 28s. 2·12d. per ton milled, it has had to be dropped from 30s. 7·09d. in January to 25s. 3·53d. per ton milled for the month of December. Owing to the impossibility of maintaining the grade of ore milled, the monthly profits had to be reduced considerably in the latter months of the year. During the coming year the monthly tonnage milled will probably have to be decreased as the reserves are depleted, and faces available for attack become fewer in number, and the yield per ton will also continue to decrease during the remainder of the life of the mine. As stated last year, the development of the payable reefs has been completed. The re-measurement of ore reserves show a total remaining of 212,707 tons of 6·84 dwts. value over the milling width, from which a yield of 85 per cent. of the mine assay value may be expected; but as in the past few years, a considerable tonnage of low-grade ore and ore previously considered unpayable but which it will be profitable to mill rather than hang up stamps, will be sent to the reduction works, thus reducing the yield to a lower point than the reserves would indicate. While the measurable ore reserves show a life for the mine of one year and two months, the actual life of the mine will probably be several months longer and extend well through the year 1913, but the profits earned during these closing months will be small. The uncertain factors entering into an estimate of profits to be earned from a mine which is finishing its career are so many that it is difficult to frame such an estimate for the whole year, but you can probably not look for a working profit of more than £38,000 for the first six months of 1912. Of the ore mined for the year, 43·02 per cent. came from Main Reef (40·6 per cent. from North Reef, and 16·38 per cent. from Slate Leader. A very small footage of subsidiary development work was done on the payable reefs, but 1,397 feet of prospecting work and a large amount of diamond drilling was done on the so-called Southern Series which disclosed at no points payable ore, and this series as a possible asset has now been abandoned and the work discontinued. The mine has been able to obtain sufficient native labour for its needs during the year but at largely increased costs for recruitment and wages.

MANAGER'S REPORT.

The Manager, Mr. K. K. H. Sartorius, writes, *inter alia:* Extensive prospecting was done on the Southern Reef Series. As shown by details of development footage, there were 1,397 feet of drives, winzes and crosscuttings. In addition, 1,425 feet of diamond drilling was performed. Of the above development, 1,248·5 feet were driven on reef, averaging 2·58 dwts. over a milling width of 24·03 inches. Development has been discontinued on this reef. The total footage on all reefs for the year was 1,676½ feet. *Mining.*—At the main shaft operations were carried on on all levels from 3rd level to below 11th level, or bottom level, and at the west shaft on all levels from 3rd level to below 5th level, or bottom level. There were mined and hoisted from all sources 207,183 tons, of which 155,491 tons, or 75·05 per cent., came from stopes, and 51,692 tons, or 24·95 per cent., from reclamation and development. 171,568 tons, equal to 81·81 per cent., were hoisted through the main shaft, 28,130 tons, equal to 13·58 per cent., through the main shaft, 28,130 tons, equal to 13·58 per cent., through the west shaft, and 7,485 tons, equal to 3·61 per cent., taken from surface open workings. The tonnage mined came from the various sources in the following proportions: Main Reef, 89,120 tons, equal to 43·02 per cent.; North Reef, 84,123 tons, equal to 40·60 per cent.; Slate Leader, 33,940 tons, equal to 16·38 per cent.; total, 207,183 tons, equal to 100·00 per cent. The upper levels—that is, between the 3rd level and the surface—produced 15,077 tons, or 7·55 per cent. of the total. *Sorting and Crushing.*—207,183 tons were sent to the sorting and crushing station, from which 22,615 tons, equal to 10·915 per cent., were sorted, and 184,568 tons sent to the mill. *Milling.*—184,568 tons were received at the mill and added to stock of 202 tons in hand, from which 184,470 tons were milled, leaving a balance of 300 tons in bins. The following are the results of milling operations for the year: Number of stamps erected, 100; number of stamps running, 100; running time, 351·56 days; tons milled, 184,470 tons; duty per stamp per 24 hours, 5·247 tons; average assay value of ore milled, 7·362 dwts.; total yield, 37,490·563 ozs. fine gold; yield per ton milled, 4·065 dwts.; average assay value of pulp leaving mill, 3·297 dwts.; extraction in mill, 55·22 per cent.; total extraction, 90·45 per cent. Working costs amounted to £134,645 8s. 4d., or 14s. 7·18d. per ton milled, being a reduction of 3·28d. as compared with the year 1910. Working profits amounted to £125,239 15s. 8d., or 13s. 6·94d. per ton milled. *Machinery and Plant.*—Extensive repairs were necessary to maintain the battery, also the shaft headgears. At the crusher plant, a supplementary motor was installed to relieve overload, and a water spray (air pressure) to allay dust. Alterations and improvements have been made to the change house for tropical natives. A water cooling tower was erected at the battery reservoir. All machinery was kept in good repair. No expenditure was incurred on capital account, the cost of all repairs and alterations mentioned being charged to working costs. The average number of white men employed, including staff and apprentices, was 99. The average number of natives employed was 1,198, and the average number working 1,166.

Romola Nigel G.M. Co., Ltd.

The following telegram has been received from the Rhodesian manager, for the information of shareholders:—"Claydon winze 'A' connected with 160 ft. level. Assay value for last 50 feet sinking and rising, 20·80 dwts. across 44·25 inches. Eastern Queen's driving started on second level."

Van Dyk Proprietary.

The Van Dyk remains closed down. The revenue and expenditure account for the past year shows: Administration and other expenses, £1,544; interest, £4,330; contribution to Miners' Phthisis Allowances Fund, £36; caretaking expenses, £594; loss on furniture and stores sold, £342; total, £6,846. From which has to be deducted the following revenue, viz.: Rents, £383; owner's share of licences, £10; interest (8 per cent. per annum) on 20 shares in Rand Mutual Assurance Company, Ltd., £16; total, £409; leaving a debit balance at 31st December, 1911, of £6,437, which has been carried to the balance sheet. The directors have continued to accept nominal fees, and members of the London Committee, the secretary, London secretary and Berlin and Paris agents have continued to serve at reduced rates of remuneration.

A Development Company Operating in Rhodesia

REQUIRES THE SERVICES OF TWO MINING ENGINEERS between the ages of 28 and 33 to make preliminary investigation of mining properties or oversee development of ground under option. Moderate knowledge of Rhodesia desirable but not imperative. Engineers who have successfully undertaken similar work on other than banket mines given preference. A moderate salaried position at start but one with good possibilities. In replying state salary expected, age, nationality, university and year of graduation. Attach record of past employment, copies of recommendations, and give names of individuals to whom we may refer.

Replies directed to—

"Rhodesia,"

Box 963, Johannesburg,

will be treated in confidence.

Dr. MELLOR'S READING OF RAND GEOLOGY.

Interesting Discussion by the Geological Society—Mr. J. S. Olver's Contribution.

To the discussion on Dr. Mellor's paper at the meeting this week of the Geological Society, Mr. J. S Olver made the following contribution :—

I understand that this will, in the ordinary course, be the last meeting at which Dr. Mellor's paper, "The Normal Section of the Lower Witwatersrand System," can be discussed. Dr. Mellor's official position—apart from his personal standing and the known thoroughness with which his work is being carried out—will inevitably impress his final reading of Rand geology with the stamp of authority. It is, therefore, most important that his reading, when it is ultimately issued in its authoritative form, should have passed beyond the controversial stage, and his course in offering preliminary statements to this society was a very wise one. It showed that his aim was to arrive at the ultimate truth, rather than to maintain a pose of personal infallibility.

But how has the society as a whole responded to Dr. Mellor's advances? What have its members done to help him to unravel his problems or to correct the errors into which the student of such a large and complex problem as this is nearly sure to fall? His first contribution was received with almost complete silence, and his second has so far been met only by a short criticism from Mr. Baring Horwood, which may be said to offer a direct negative to the central idea of Dr. Mellor's reading.

Now, what does this prevailing silence mean? It might be taken by the interested layman to imply consent—that Dr. Mellor had merely co-ordinated the work of previous observers, linking up the surveys of different areas and correcting minor discrepancies—making, in fact, a mere compilation from the work of acknowledged authorities without falling foul of the main contentions of any one of them. But this is very far from the truth. It is, perhaps, a mistake to speak of accepted authority with regard to Rand geology as a whole, but there has for some years been a fashionable creed which may be said to embrace the following articles—an accepted succession of beds in the Central Rand; a purely local duplication of the Lower Witwatersrand beds in the western end of the Bezuidenhout Valley; and the identity of the reefs worked in the Kleinfontein and Randfontein districts with the Main Reef Series. A certain latitude of belief has been allowed with regard to the Rietfontein reefs, but they have not been included in the Witwatersrand System; while, though Dr. Molengraaf's section of the beds at Witpoortje seems to have been accepted as correct by the adherents of this school, they have made no serious attempt to actually link up the beds in that section with those in the Johannesburg area. It has been simply laid down that there is a very considerable widening of the Witwatersrand System towards the west. They appear to have made no authoritative pronouncement upon the nature of the Witpoortje break.

Though this may be said to be the fashionable creed, it has not been accepted by anything like the whole body of geologists—in fact no single one of its articles has been universally accepted as yet. Perhaps the most powerful body of dissentient opinion is that which was voiced by Mr. Bleloch some two years ago. This heresy has been treated somewhat scornfully by the exponents of orthodox opinion, but a large number of the heretics are still unconverted. They hold that there is no duplication in the Bezuidenhout Valley, and that the orthodox idea of the succession of the Lower Witwatersrand beds is therefore wrong; that the Rietfontein Reefs are an integral part of the Lower Witwatersrand System; that the Kleinfontein Reefs are identical with those at Rietfontein and do not represent the Main Reef Series. The gulf between these two schools is sufficiently wide, and that Mr. Bleloch's supporters are not to be altogether ignored is evidenced by Mr. Baring Horwood's contribution to this discussion. It will be admitted that Mr. Horwood's opinions on Rand geology are entitled to respect, and he seems to be ready to subscribe to the majority of Mr. Bleloch's dogmas.

Now, Dr. Mellor has not accepted any part of this heterodox belief, but he is just as strongly opposed to the orthodox creed in many of its essential articles. He claims that the Bezuidenhout Valley fault, far from being a purely local phenomenon, is a powerful factor affecting the apparent succession of the beds from Witpoortje, in the west, to Rietfontein, in the east: that the orthodox succession of the beds in the Central Rand is far from complete; that there is no true thickening of the system from east to west, but that each of the beds in the Witpoortje section is present—though not always exposed—in the Central and Eastern areas. He contends, in fact, that the apparent variations in the system are attributable, not, as the exponents of the orthodox creed believe, to the lenticular development of local beds, but to the local elimination of beds which originally maintained a uniform succession throughout the whole area dealt with. Some of the supposed effects of this faulting are so remarkable, so far-reaching and so subversive of orthodox opinion that they surely cannot be accepted without very thorough discussion by the members of this society who take an active interest in the geology of the Witwatersrand. If this society is to justify its claim to represent the living body of geological opinion in South Africa it cannot continue to maintain a passive attitude on a question of such vast importance as this.

I have recently published, in my book "Faults and Dykes," a new reading of Rand geology which differs in many important particulars from each of the three schools of thought referred to above. This reading has also been received with silence—a silence which in this case cannot be taken to imply consent, and which can scarcely be said to encourage or stimulate original thought and research.

My position is very different from that of Dr. Mellor, since I did not come forward as a recognised geologist; but I think I can fairly say that my reading was based on an examination of the area concerned as thorough as his is admitted to be, and it does not seem too much to claim that my suggestions are at least worthy of consideration—if only for the reasons that they are based on a first-hand study, and that they offer a possible solution of the whole problem.

I have already admitted that I was mistaken with regard to the suggested continuation of the Rietfontein reefs to the north-east, and I am quite prepared to find that I have made mistakes on other important details.

I find myself in practical agreement with Dr. Mellor on many points in which he differs from what I have called the orthodox creed. I deny that there is any material widening of the system, or increase in the number of its component beds, from east to west, and I agree with him that the apparent changes are almost entirely due to longitudinal faulting. I do not go quite as far as he does in one respect, since I believe that the beds are more lenticular—or show a greater original variation in width—than he is prepared to admit; and that in some cases his impression of the local elimination or squeezing of certain beds is to be accounted for either by original variation in width, or, particularly in certain instances on the south side of the Bezuidenhout Valley, by mistakes in the identification of the beds.

I side with him as against Mr. Horwood in his identification of the "Coronation Shales" and accompanying beds to the south-west of Rietfontein, and I agree generally with him as to the identification of the Government Reef Series at the Scottish Monument. My tracing of the faulting to the south of Rietfontein and through the Bezuidenhout Valley is very similar to his, and the course of the fault shown by him to the west of Maraisburg seems to be identical with that of my "Orange Grove Fault." He also agrees with me that there is no outcrop of the contorted bed for a long distance along the "Orange Grove Fault," where that bed was located by previous observers.

Our work was done quite independently, and yet it will be seen that we have quite a lot of common ground; and on each of the above points we have departed from the orthodox conception of Rand geology. There are still many important points on which Dr. Mellor and I are at variance, such as the true horizon of the "Coronation Shales" (which I have suggested to be a mere duplication of the contorted bed) and the number and course of the faults and the nature of their movements and action. With regard to the faults, Dr. Mellor has not yet dealt with the Witpoortje Break, and I anticipate that when he does so he will be obliged to accept my solution of that problem in its general outlines. If that be so, his final reading of the main faulting will probably approximate more closely to mine. I do not propose to discuss these questions further at present, but here is another very important point on which I differ from Dr. Mellor, and which I should like to see fully discussed at this stage, i.e., the relation of the Rietfontein Reefs to the Witwatersrand system.

On this point Dr. Mellor has followed the orthodox school, while I have enunciated an entirely new theory—that the Rietfontein reefs are simply a duplication of the Main Reef Series. Now, I think it will be admitted that I am entitled to express an opinion on that series, and I claim that a *prima facie* case for my theory has been made out.

(To be continued.)

The Dunraven for Sale.

Attention is drawn to the advertisement offering for sale by tender, as a going concern, the well-known Dunraven Mine, Selukwe, Rhodesia. Tenders are invited for the purchase of the mine, consisting of 50 claims and 3 acre sites, of which the B.S.A. Company's interests are commuted in 30 claims and are free from royalties, situated about two miles from Selukwe Station, together with the machinery and plant thereon. Full particulars and schedule of plant, etc., and order to inspect can be obtained at the mine. Tenders to be sealed and marked "Tender, Dunraven Mine." and must be forwarded to the Dunraven Mine on or before the 15th April.

An old resident of Pretoria, after two months' experience of the Vaal River and Bloemhof Diggings, says the life there is a "huge, demoralising gamble, with odds of 30 to 1 against the diggers."

MINING MEN AND MATTERS.

Mr. Bernard Price left for Capetown last Saturday night, *en route* to England, on a six months' holiday.

* * * *

Mr. H. Nicols, late of De Beers Consolidated Mines, Ltd., together with Mr. Andrew Reid, have been appointed joint managers of the Kamfersdam Mine.

* * * *

Mr. P. Q. Treloar, manager of the Roodepoort United G.M., has resigned, and is succeeded by Mr. Ross, of the Vogelstruis Estates G.M., whose position is being filled by Mr. R. A. Alston, formerly of the Glencairn G.M.

* * * *

Mr. W. R. Dowling (vice-president) presided at a meeting of the Chemical, Metallurgical and Mining Society, held on Saturday night at the School of Mines, Eloff Street. There was a large attendance of members present. The chairman took an opportunity of extending a welcome to Mr. Alfred James, a past president of the Institute of Mining and Metallurgy, and an old pioneer of the Rand and Barberton, who, he said, arrived on the Rand in 1888, had been identified with the Langlaagte, and was afterwards associated with the introduction of the cyanide process on these fields. That was in 1890, and in that connection the chairman mentioned that he had recently seen an interesting photograph of the original cyanide demonstration plant on the old Salisbury mine, which comparatively few of them would remember. In that photograph were Mr. John Stuart MacArthur, the inventor of the cyanide process, Mr. Alfred James, and their old friend, Dr. Caldecott. An interesting feature of the plant was that it was an agitating plant for the treatment of sand. It seemed to him (the chairman) that to that plant and the enterprise of the gentlemen he had named, they owed the position of the fields; for on the low-grade ore they were able to make a profit for the companies and enable the fields to work on so large a scale. Mr. James was the centre of metallurgical knowledge in London. Mr. James, who was received with applause, expressed his pleasure in being present, and the obligation of the industry to the results of the research and painstaking investigation carried on by the members of the Society that he was addressing. All over the world the transactions of the Society were read with interest. The members of the Society had particularly identified themselves with the subject of crushing and milling. Personally he would have welcomed it if they had gone to the other end and had devoted some attention to the products in the material that went to the waste dams. But with regard to the information they had placed at the disposal of the world on the subject of how to increase the duty of the stamp and the efficiency of the grinding apparatus, he would confess that he would personally much welcome an attempt to induce the Mines Trials Committee to undertake more of that research which had been so useful to the industry here and elsewhere, as to definite data of tube milling. There were many points on which they were working in the dark, and if they had more data worked out by the mines it would be both interesting and informative.

Vellefontein Tin.

An extraordinary general meeting of the Vellefontein Tin Company, Ltd., will be held at the registered office of the company, Pretoria, on May 21, when the subjoined resolution will be proposed: "That the company be wound up voluntarily; that Lawrence Handley, of Pretoria, be, and he is hereby, appointed liquidator for the purpose of winding up the affairs and distributing the assets of the company, and that the remuneration to be paid to him shall be on the same scale as that usually paid to a trustee in insolvency."

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CHARCOAL - 72/6 per Ton.

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INVESTORS' DIARY.

The following company meetings have been announced :—

March 26.—Cassel Coal Co.
March 27.—Rand Mines; Modder Deep Levels; Princess Estate; Geduld Prop.; S.A. Gold Mines.
March 28.—East Rand Deep.
March 29.—Simmer Deep; Jupiter; Randfontein Deep.
April 12.—Transvaal Consolidated Lands.
April 17.—South Randfontein Deep.
April 25.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep; Cloverfield (Extraordinary General Meetings).
April 30.—New Era; Springs Mines; Brakpan Mines; Transvaal Coal Trust.
May 3.—Cinderella Consolidated; Aurora West.
May 8.—Roberts Victor Diamonds.
May 10.—Ferreira Deep; Ferreira G.M.
May 17.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep (Extraordinary General Meetings).
May 18.—Aurora West.
May 22.—Apex Mines; New Kleinfontein.
May 23.—Benoni Consolidated; Crown Mines.
May 29.—Robinson Gold Mines.
May 30.—Village Deep.
June 4.—Ferreira G.M.
June 5.—Rand Mines.
June 26.—Transvaal Consolidated Lands.
July 19.—Transvaal Consolidated Lands.

Situations Wanted.

Position as Mine Manager, in Transvaal, or any part of the World. Advertiser has Home Training and 14 years' experience in all branches of Gold Mining on the Rand. Holds Transvaal Mine Manager's and Surveyor's Certificates.

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CERTIFICATED MINE MANAGER

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A Scotsman, aged 50, recently passed as a first-class life for Insurance, is willing to go to any Country or undertake any mission or work of a nature dangerous to life and limb, provided same has no dishonourable motives, and good hearing not essential.

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THE WEEK IN THE SHAREMARKET.

Fluctuating—Coal Crisis Keeping Markets Undecided.

But for the coal crisis in Great Britain, the market would undoubtedly have gone better this week. As it is, there has been a reassuring display of firmness in face of a very trying time. How and when the situation will mend, we do not profess to foresee, but the tone of the market gives reason to expect that when that event does come the delayed activity may be resumed. The good annual reports now being issued should have a reassuring effect on the other side, and though the labour question is still unsettled the outlook is better. It is a pity that the Assembly at Capetown does not evolve some businesslike way of dealing with this question instead of wasting weary hours in fruitless academic discussions. The Budget speech should provide the market with food for discussion, the references to mining taxation being particularly interesting. The changes in the list for the week are not very important, as will be seen below.

	*	*	*	*		
	Friday, 15th	Sat., 16th.	Monday, 18th.	Tuesday, 19th.	Wed., 20th.	Thurs. 21st.
African Farms ...	17 6	17 3	16 6	16 0	17 0	16 9
Aurora West ...	10 0B	...	...	...	...	...
Apex Mines ...	38 0	35 0S	31 0B	..	33 0B	35 0
Bantjes Consolidated	25 6	25 3S	24 9B	24 0	24 9	21 3B
Benonis	6 6	6 0	5 6B	5 5B	5 9	5 6B
Blaauwbosch ...	...	...	...	15 0B	15 0B	...
Bushveld Tins ...	1 1B	1 0	1 2S	1 0B	..	1 2S
Brakpan Mines ...	59 6S	58 0B	58 0B	57 0B	57 6B	57 0B
British S A. ...	...	...	...	29 0S	28 9B	28 0B
City and Suburban ...	49 0	48 6B	48 9	48 0	48 6	48 0B
City Deeps	53 9	53 0	52 0B	51 6B	53 3	52 6B
Cloverfield Mines ...	5 8	5 7	5 5	4 10	5 5	5 0B
Cons. Langlaagtes ...	22 0	22 0	21 6	20 6	21 3	21 0B
Cons. Main Reefs ...	18 9B	18 9	18 3B	18 0B	18 3	18 0B
Clydesdales	10 0B	10 0B	10 0B	...	10 0B	...
Coronation Freeholds	0 7B	0 9	0 8B	...	0 7B	0 7B
Con. Investment ..	23 9B	...	22 0B	...	22 6B	22 6B
Concrete Cons. ...	10 0B	...	10 0	10 0B	10 0B	...
Crown Mines ...	...	...	...	132 3B	...	...
East Rand Cent. ...	8 9	8 0B	8 0B	8 0B	8 0B	8 0B
East Rand Coals ...	2 5	2 4B	2 4B	2 5	2 6	2 5B
East Rand Deeps ..	2 9	2 9	2 4B	2 3S	2 3	2 2S
East Rand Props. ..	58 0B	58 0B	56 0	55 6	59 0	59 0B
East Rand Deb. ...	£94	£94	£93	£94	£92	£92
Eastern Gold Mines	2 0	2 1B	2 0	2 0B	2 0B	2 0B
Govt. Areas	24 3	24 0	23 9	23 0	23 9	23 3B
Glencoe (Natal) Colls.	6 5B	6 5B	6 5B	6 5B	6 5B	..
Glynn's Lydenburgs	33 9	...	...	..	...	...
Glencairns	4 0B	4 0B	5 0S	4 0B	4 0B	5 0S
General Minings ...	22 3B	22 0B	24 0S	...	...	...
Jumpers	10 3B	...	10 0B	11 0S	9 0B	9 0B
Jupiters	11 0	11 0B	11 0	10 3B	10 6B	10 9B
Kaalfontein Diamonds	0 9B	0 6B	0 6B	0 6B	...	0 7B
Klerksdorp Props. ...	3 6	3 3B	3 0B	3 1B	3 2B	3 1B
Knight Central ...	15 6	15 0B	14 6B	15 0	15 0B	14 9B
Knights Deeps ...	51 0B	..	...	...	...	...
Kleinfontein Estates	...	...	...	...	...	32 6S
Lace Props.	3 10	3 9	3 6	3 6B	3 7	3 6B
Lydenburg Gold Farms	8 9	8 7B	8 7B	8 7	8 7	8 7B
Main Reef Wests ...	31 3	29 9	29 0	28 6	29 0B	28 6B
Modder B's	55 6B	54 6B	54 6	52 9B	54 0B	52 0B
Midas Deeps ...	1 3B	1 3B	1 3B	1 2B	1 3	1 2B
Middelvlei Estates...	2 2B	2 0B	2 0B	2 0B	2 0B	2 0B
Modder Deeps ...	27 0B	24 0B	24 0B	22 6B	25 0	...
Meyer and Charltons	84 0B	82 0B	81 0B	80 0B	81 0B	82 6B
New Eras	6 9B	6 10	6 3B	6 6B	7 0	6 9B
New Kleinfonteins ..	29 0B	29 6	29 0B	29 0	28 6B	29 6
New Rietfonteins ...	...	11 6B	11 0B	10 9	11 0	10 9B
New Unifieds ...	...	...	17 0B	19 0S	18 0B	17 0B
New Boksburgs ...	2 9	2 0B	2 6S	1 10S	1 6B	..
Nigels	16 6B	...	...	...	...	...
Orange Diamonds ..	2 1B	1 10B	1 9B	1 9B	1 9B	1 9B

B Buyers. S Sellers.

	Friday, 15th.	Sat., 16th	Monday, 18th.	Tuesday, 19th	Wed., 20th.	Thurs. 21st.
Pretoria Cement Co.	52 6B	50 0B	51 0B	51 6B	50 0	48 0B
Princess	11 9B	11 6B	10 0	10 0B	11 6B	11 0B
Potchefstroom Est....	...	...	1 9B	...	..	1 6B
Rand Nucleus ...	3 1	3 5	3 0B	3 0B	3 1B	3 3B
Randfontein Estates	35 9	34 0S	33 6B	33 9	34 6	34 3B
Rooiberg Minerals	29 0	28 6	27 6B	27 6B	28 6B	28 6
Rand Klip	5 6	5 0	5 0B	4 9B	5 1B	5 2B
Ryan Nigels ..	4 1B	4 0B	4 0B	4 0B	4 0	4 0B
Robinson Deeps ...	56 0B	...	...	...	53 0B	52 6B
Rood. Durban Deeps	26 0B	25 0B	26 2S	...	...	...
Rood. U.M.R. ...	...	...	...	...	22 0S	..
Simmer Deeps ...	...	4 0B	3 3S	3 6B	4 0B	4 6
South African Lands	5 0	4 9	4 7	4 6	4 10	4 9B
S. Randfontein Deeps	4 9	4 6	4 6B	4 0S	4 6	4 4B
Sub Nigels	6 3B	6 3	6 9	6 0B	6 6B	6 3B
S. A. Breweries ...	39 0B	39 0B	39 0B	39 0B	39 0B	39 0B
Springs Mines ...	11 6	11 0B	10 9B	10 6B	...	11 0B
Trans. G.M. Estates	43 6B	43 0B	43 0B	43 0B	44 0B	43 0B
Temple Tins	3 0S	...	...	3 6S	2 9B	...
Trans. Coal Trusts...	39 6B	39 6	38 3B	36 0B	36 0B	37 0B
Tudors	...	2 0S	...	...	2 0B	...
Van Ryn Deeps ...	8 1	...	7 6B	7 9B	7 9B	7 9B
Village Deeps ...	43 2S	44 0S	41 0B	40 9	41 3	40 6B
Vogel. Cons. Deeps...	2 6S	2 0B	1 9B	1 9B	1 9B	1 9B
Wolhuters	22 6	22 6B	22 6B	22 6	22 0B	22 3
Wit. Deeps	53 6	52 0B	53 0S	51 0	51 0B	51 0B
West Rand Con. ...	11 3B	11 6	8 6B	...	...	10 6B
Zaaiplaats	54 6	52 6	50 0B	48 0	47 0B	47 0B

B Buyers. S Sellers.

The Acting Secretary for Agriculture has accepted the undermentioned tenders for supplies during the calendar year 1912, to the Grootfontein Agricultural School, Middelburg, Cape Province, viz. :—Messrs. W. Don and Co., Port Elizabeth : Bacon (South African), pearl barley, beef (corned), chicory, cocoa (Van Houten's), coffee (raw bean), egg powder (Bird's), essences, flour (pea), fruit (dried), fish (tinned), jelly powders, pickles (Morton's), raisins (Cape), syrup (golden), soap (blue mottled), soda (washing), salt (fine), sauce (Worcester), tea (Nectar). W. C. Turpin, P.O. Box 30, Middelburg, Cape Province : Colonial rolled oats (Tiger brand). Messrs. Stahl and Co., P.O. Box 88, Middelburg, Cape Province : Baking powder (Royal), chutney (Hotch Potch), custard powder (Bird's), currants, macaroni, matches, maizena, oil (Lucca), peas (split), spice, soap (carbolic), salt (coarse), sago (fine), tapioca (flake), beef (Colonial). Messrs. D. Mackinnon, P.O. Box 4, Middelburg, Cape Province : Boot paste (Nugget), candles (South African), cinnamon (stick), curry powder (Cape), flour (wheat), fish (tinned), gelatine (Nelson's), insect powder (Keating's), jams (tinned), marmalade (South African), mustard (Keen's), milk (Nestle's), oatmeal (loose), pudding powders (Yeatman's), plate polish (Goddard's), rice (bass), sugar (white, syrup) (golden), soad (Pear's unscented), tanglefoot, vermicelli.

Companies in Liquidation.

Eureka Brick Co., Ltd., The; a meeting of creditors will be held at the office of the company, 25 Erasmus Buildings, Pretoria, on March 8th. Evelyn Glover, liquidator.

Quince Syndicate, Ltd. ; the final meeting will be held at 30 Stock Exchange Buildings, Johannesburg, on April 9th. G. Astley, liquidator.

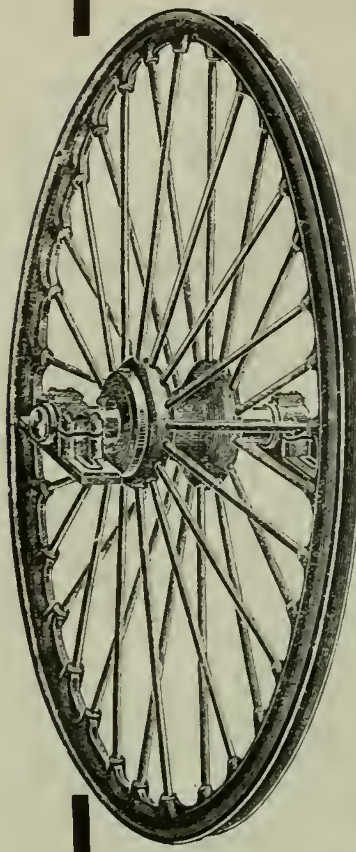
Severn Estates, Ltd., The (voluntary) : March 4th ; meeting of creditors will be held at 114 Market Street, Johannesburg, on March 20th. William E. Moxley, liquidator.

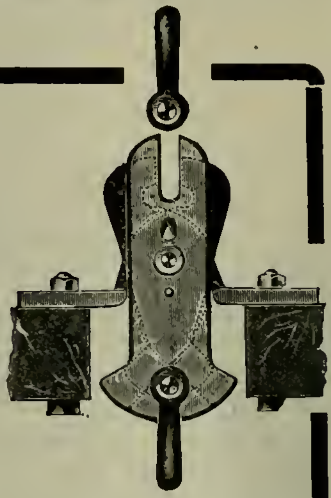
Three facts regarding the Transvaal worth remembering:

(1) The Transvaal is producing over one-third of the world's gold output.

(2) Transvaal mines have spent 24 millions sterling on machinery and plant.

(3) The *South African Mining Journal* is the official organ of the Mine Managers' Association.





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FACTS & FIGURES.

THE "SISKOL" STOPE-DRILL, TYPE S.A. 65

THE RECORD BREAKER.

HERE ARE SOME OF ITS PERFORMANCES:

A First Prize in Transvaal Stope-Drill Competition, won **£2,500.**

4 "SISKOL" Drills stoped **144·4** *fathoms and box holed* **6***ft. in one month---***104** *Drill Shifts.*

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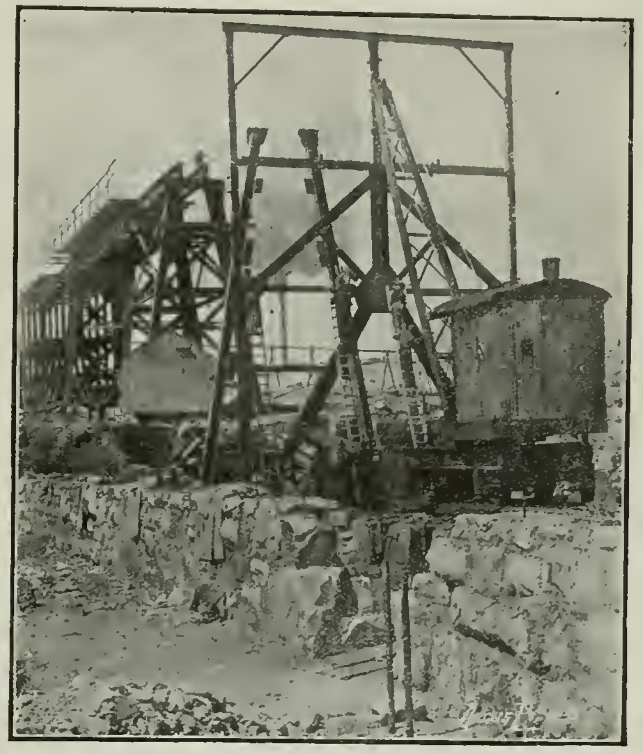
Engineering Notes and News.

Electricity in Mines: Revised Rules.

The long-expected Special Rules for the Installation and Use of Electricity in Mines in the United Kingdom have now been issued in their revised form by the Home Office. Compared with the original draft issued early in 1911, the alterations, while few in number, are of considerable importance. In an explanatory circular accompanying the Rules, Sir Edward Troup, K.C.B., Permanent Under-Secretary of State at the Home Office, states that the Home Secretary has considered the objections which were sent to him in regard to certain points in the Rules as originally drafted. He is advised by the Departmental Committee which framed the Rules as originally proposed that certain modifications to meet the objections may properly be made, and he understands that these modifications, which will be found embodied in the amended text, are accepted by all the coalowners' associations throughout the kingdom from whose members objections were received. The circular concludes by stating that the Home Secretary thinks that for the purpose of bringing the Rules, as amended, into operation, the simplest course will be to re-propose them in the new shape in pursuance of Section 54, Sub-section (2), of the Coal Mines Regulation Act, 1887. Each owner is advised that if he does not object to the Rules within twenty days after their receipt, they will become established at his mine.

S.A.I. of E.E.: Annual Report.

The second annual report of the South African Institute of Electrical Engineers contains the following *inter alia*:—"Despite the high pressure, at which most of the members have been compelled to work during the year, owing to the ever-increasing use of electricity on the mines and elsewhere, it may be claimed on the whole that much good work has been accomplished, both for the Institute and its members and the profession in South Africa as a whole. The membership of the Institute is increasing slowly but none the less satisfactorily. The Council had hoped to have doubled the membership reported last year, especially having in view the fact that there are so very many gentlemen connected with the profession resident along the reef, and elsewhere in South Africa, who have not as yet thrown in their lot with the Institute. It is hoped that the coming year will emphasize the fact enunciated by Mr. Chaplin at the annual dinner that the Institute has a great future, because it lies with it to educate the general public in the technical details of electricity and electrical science, and to act as pioneers in spreading electrical science all over South Africa. If every present member will induce only one electrical friend to join the Institute, the membership will be doubled. During the year under review there have been elected and admitted 8 members, 32 associate members, 16 associates, and 16 students, or a total of 72. The Council would like to point out that great care is taken to ensure that every candidate for election or admittance is graded according to his qualifications and past experience. Those proposing candidates for election are therefore requested to see that the proposal forms are filled up carefully, and the fullest details given of past experience, in order that the grading may be accurate. Recently, many proposal forms have been referred back to candidates on this account. On the whole the papers read have reached a high level of excellence. In March last the Institute was honoured by the attendance at its meeting of Sir Wm. Preece, K.C.B., F.R.S., who read an interesting paper on "Some Aspects of Theory," which was highly appreciated by those present. The discussions are also showing improvement, and it is noted that many more members are availing themselves of the opportunity to submit notes of their past experience in the discussions, which is all to the general welfare of members. Yet the Council looks to a still greater interest being taken in this direction. More papers are required, and a fuller discussion of each paper submitted is needed to enable the objects of the Institute to be fulfilled.



THE NEW MILL AT CROWN MINES, TAKEN WHEN IN THE CONSTRUCTION STAGE.

The Modder B. Machinery and Plant.

DETAILS FROM OFFICIAL DESCRIPTION—A MODEL AND MODERN EQUIPMENT.

THE following is taken from the official description of the Modder B plant and mine prepared for the visit of the South African Institute of Engineers last week, which was accompanied by excellent illustrations. The rock hoist is of the Ward-Leonard type, with a single twelve feet diameter by five feet parallel drum. The maximum winding speed is one thousand five hundred feet per minute. The motor is about one thousand one hundred maximum h.p. and is direct connected. The hoist is capable of raising four hundred tons per hour. The electrical portion was made by the A.E.G. and the mechanical portion by Fraser and Chalmers. The main hoist is an eighteen inch by thirty-six inch Tangye direct driven steam engine with drums seven feet diameter by two feet six inches. The air compressor plant consists of two sixty-five drill Belliss and Morcom sets, direct connected to one thousand h.p. Westinghouse motors. One sixty-five drill. Fraser and Chalmers, steam-driven compressor with rope grooved flywheel for subsequent electric driving, a King Reidler and a small Ingersoll machine, all steam driven, are kept in reserve. Steam is supplied by a one thousand five hundred h.p. boiler plant.

Sorting and Crushing Station.—The skips tip the ore on to double grizzlies; the top grizzly has wide openings and spreads the load, giving the bottom grizzly, which is set closer, a chance to more effectively separate the fines from the coarse. There are two bins, fines and coarse. The fines bin discharges on to a twenty-four inch belt carrying the rock to the mill bins. The coarse bins discharge on to the two thirty-six inch sorting belts, through chutes with grizzlies in the bottom. Water is sprayed on the rock as it passes through the belt loading chutes, and the rock is washed clean, the small stuff passing through the grizzly and thence to pumps which send it to the tube mills. The rock is sorted intermittently, and

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large chutes are provided at the ends of the belts to balance the loads on the crushers. Three No. 6 Gates crushers, of which one is always a spare, crush the sorted rock to mill size. These crushers are capable of crushing sixty tons per hour. Either sorting belt is capable of supplying the present mill demand of one thousand tons per day, if necessary. The rock from the crusher joins the fines and is elevated to the mill by a twenty-four inch conveyor helt. Small bins for holding tube mill pebbles are situated at intervals along the length of the sorting belts. These bins, when full, are discharged on to the fines belt above mentioned and are carried up to a special bin at the top of the mill, the main belts having previously been run clean of ore.

Mill.—The conveyor from the crusher station passes up into the gable of the mill and discharges on to a shuttle belt in the centre of the bin. This single shuttle belt fills all the bins, and the arrangement gives an exceptionally large capacity by increasing the effective height of the bin. The total storage capacity is over four thousand tons. The stamping machinery is of the usual type, the falling weight, new, being one thousand six hundred and sixty pounds. There are eighty stamps erected, but the steelwork and bins are completed to allow another row of eighty stamps to be erected at the back of the existing eighty. The cam shaft boxes are held in line by an eighteen inch by twelve inch I. beam, which is bolted to and rests on the king posts. The capacity of the mill is thirty-one thousand tons per month.

Tube Mill Plant.—The crushed ore is pumped by ten inch R.D. pumps. These are internally reduced to the equivalent of eight inch pumps, so as to allow of future extension with a minimum change The pulp is elevated and distributed in the usual manner. There are three cone classifiers to each tube mill, the large one being fitted with Caldecott diaphragms. A very thick pulp is obtained. There are five twenty-five feet by five feet six inch tube mills, geared directly to one hundred h.p three hundred and sixty-five revolution motors. The tube mill speed is about twenty-eight revolutions per minute. For each tube mill six stationary twelve feet by five feet amalgamating plates, having a special pulp distributing arrangement, are provided.

Sands Plant.—After passing the plates the pulp is again raised, as before, to eight two feet nine inch conical concentrators. The heavy product underflow from these cones goes back to the tube mills, set aside for this product, for regrinding. The overflow passes to nine feet conical concentrators. The underflow from these cones passes to the Butters and Mein distributors. The sand is collected in water. There are four forty-five feet by nine feet sands collectors with overflow rims and no slime gates. The large and small cylindrical concentrators have hydraulic arrangements at the bottom which thoroughly washes the underflow, giving good classification. The overflow from the large cones passes directly to slimes collector tanks. The collected sand is shovelled out of the tanks one to twenty-four inch shuttle conveyors. Three shuttle belts take care of all the collectors, passing the sand on to another conveyor which carries it to the Blaisdell distributor. This distributor serves eight forty-five feet by ten feet six inch treatment tanks. The treated sand is trucked to the dumps in the usual way—by means of mechanical haulage.

Slimes Plant.—The slime is collected in four sixty feet diameter by twelve feet deep tanks with conical bottoms four feet deep, where it is settled in the usual manner. The settled slime is diluted with solution and transferred to three Brown vats, each fifteen feet diameter by forty-five feet deep. Each vat has a capacity of eighty tons slime, which is aerated for eight hours. After aeration the slime is kept in suspension by a mechanical stirrer driven by a fifteen h.p. motor. From the stock pulp tank the pulp is drawn off as required by the Butters plant. The Butters plant, having two hundred and fifty-six leaves and eight filter boxes, is designed on the gravity system. Its capacity is five hundred tons of dry slimes per day.

Refinery.—The refinery is very well equipped with the usual apparatus. Considerable thought has been spent on this unit, the clean-up room and bisulphate plant in particular being very complete. The interchangeable Merrill presses each have a capacity of one thousand tons of solution per day. Zinc dust is added at the suction of the pumps supplying these presses. These pumps and zinc feeding devices are installed in the pump house, just east of the sands plant. The property is equipped with a complete waterborne sewerage system and septic tank.

Property and Underground.—The property consists of one thousand four hundred and sixty-eight claims, of which about one thousand three hundred and fifty claims are reef bearing. The length on the strike is twelve thousand three hundred feet, and the main shaft through which all rock is handled is situated in the middle of the property. The shaft is seven hundred feet deep, and has five compartments, two main skipways with six ton skips for rock, two cage ways with three-decker cages for handling men and materials. and one compartment for pipes. Only one reef, namely, the main reef, lying immediately in contact with the footwall slates of the district, is worked. The property is opened up by means of a main haulage way driven nearly straight for a length of one thousand two hundred and fifty feet east and four thousand five hundred and fifty feet west in the footwall of the reef. Subsidiary crosscuts from this main level intersect the reef, which is opened up by means of drives and winzes in large blocks averaging about one thousand by eight hundred feet. Each stope is equipped with an air winch and main central track from which branches are carried to the stope face at suitable intervals. The ore is loaded on to the trucks at the face and lowered down the central track, in trains from two to five trucks. to collecting partings on the main haulage level.

Railways and Roads.

In the course of their report to Parliament, the Railway Board observe:—The Railway Commissioners during their tour of inspection of country districts, the claims of which for railway communication are being considered by the Government, had impressed upon them the extent to which transport suffers owing to the condition of the roads in many districts. In the absence of good roads in the area where traffic has to be conveyed to and from railway stations and sidings, the value of a railway for the development of a district is seriously impaired, while the railway itself does not secure as a consequence the support it would otherwise receive. As the credit of the whole country is pledged when money is found for the building of a railway it seems but reasonable for means to be provided for making the fullest use of the railway when built, and it is therefore suggested that attention should be given to this question when any fresh proposals for the construction of new railways are being considered by Parliament with a view to provision being made by the proper authorities for the construction of such necessary roads simultaneously with the building of a railway.

Electrical Accidents in Mines.

This week at a general meeting of members of the South African Institute of Electrical Engineers, Mr. J. S. Ross (in the course of discussion upon a paper by Mr. A. E. Gibbs, upon "Troubles of Cables") dealt in detail with the question of efficient earthing. He emphasised how important was attention to details in mine insulation, as was evidenced by the following facts taken from the Home Office report on accidents in British coal mines. The report covered a period from January, 1905, to January, 1911, and showed that electric shock was responsible for 53 accidents and 53 deaths. The causes of the accidents were as follows: Absence of or inefficient earthing, 22 accidents, 24 deaths; defective insulation of cable system, 20 accidents, 20 deaths; contact with uninsulated line parts, 9 accidents, 9 deaths; miscellaneous causes, 2 accidents, 2 deaths. In the Hebwon Mine, New South Wales, accidents from electric shock were so prevalent that the mine was shut down, and a commission was appointed to enquire into the matter. These examples should impress the members of the Society that sufficient earthing of cables and electrical equipment was of more importance than the conditions; and that it was their duty in the interests of life and limb, as well as of the profession, to see that all possible precautions were taken on the Rand goldfields to prevent such occurrences.

Plough for Small Irrigation Furrows.

Wheat growers and others who practise irrigation will be interested to learn that the Cradock Agricultural Society (Cape) has decided to offer at its 1913 show a £25 prize for a plough suitable for making small furrows such as are necessary in wheat lands for irrigation purposes. The usual method of making such furrows is to plough the ground loose and have it thrown out by natives with spades, and it is to do away with this hand work in making and cleaning small furrows that this special implement is required. Experiments made locally have demonstrated that a great deal of time and manual labour can be saved by such an implement.

It is notified in the "Provincial Gazette" that the following tenders have been accepted for the undermentioned services in the Province of Natal:—

Additions, Durban High School.—Union Joinery Works, £4,527 6s. 9d.
Erection of Bridge over Lion's River.—George Grundy, £2,935 7s.
Erection of Latrines, Maritzburg College.—Baker and Smith, £1,295.
Erection of Bridge over Pemvaan River.—J L. Mouritzen, £2,340 4s. 7d.
Erection of Bridge over Lindiques Spruit, Estcourt Division.—J. Brand, £473 2s. 6d.
Masonry and Earthwork of Bridge over Batje Spruit, 'Nqutu Division.—J. Brand, £1,303 2s. 6d.

Finance, Commerce, and Industries.

Mule Breeding. Undoubtedly one of our most far-seeing public men is Mr. J. X. Merriman, and with his recent statement to the effect that the market for mules which was now in the Argentine should be in the north-west of the Cape Province, the majority will agree, remarks the *Farmers' Journal.* Mule breeders in South Africa seem to be few and far between, and apart from Mr. Cuthbert A. Pope, of Molteno, which is in the Eastern Province, that paper does not know anyone seriously endeavouring to cater for the demand for mules and donkeys which, entirely apart from East Coast fever considerations, are a means of transport eminently adapted to South African conditions. It is noteworthy that Mr. Leggat Neale, lately manager of the T.G.M.E., has started mule breeding on a large scale in the O.F.S.

* * * *

Glycerine Convention Threatened. The British Convention which regulates chemically pure glycerine is threatened with disruption on 4th March unless some means can be found of satisfying two of the most important members—namely, Joseph Crosfield and Sons, Ltd., and William Gossage and Sons, Ltd., who gave the necessary thirty days' notice to terminate the agreement.. Notice has also been given of their withdrawal from the Continental Convention, so that failure to find a *modus vivendi* would mean the breakdown of the international arrangement at present obtaining, by which the trading spheres of the various groups are delimited. Free competition, both at home and on the Continent, would quickly make its influence felt on prices, which are already to a considerable extent nominal. The Convention does not apply to crude or industrial glycerine, but to C.P. glycerine. It collapsed in 1905, after a career of nearly five years, but was reconstituted in 1907, since when it has played an important part in regulating prices. During the two or three years preceding the end of 1910 prices had a sensational rise, the high-water mark of £105 per ton being reached for the industrial article. Glycerine derives its chief importance as an article of commerce from the part it plays in the manufacture of high explosives, the demand in this connection having increased enormously of late years. It is obtained principally from the oils and fats used in the process of soap making, the waste liquor containing an average of 9 per cent. of glycerine. Soapmakers, as a rule, sell their crude glycerine to the refiner, and particularly to the great European house of Nobel.

* * * *

Tree Planting. The *Union Gazette* publishes a revised list of the cost of tree seeds from Government stocks in order to encourage tree-planting in the Union of South Africa. The tariff will come into effect as from the 1st of April next. The report of the Chief Conservator of Forests, Mr. J. Storr Lister, I.S.O., for the year ending 31st December, 1910, has been recently published. Its belated appearance has no doubt been due to causes for which the official concerned is not responsible. It incorporates a report on the Government railway-sleeper plantations for the same period, and reports on the forest services of the separate provinces immediately prior to Union. With Union, the forest departments have been amalgamated, and attached to the portfolio of the Minister of Education. It might have been thought that the work would more properly belong to the Agricultural Minister. A comprehensive forest law is in contemplation. One point to be noted from the report is that the demand for charcoal from the forest estates is increasing. For the working of suction gas engines it is declared to be equal to the best Welsh anthracite coal. The returns of the Customs Department at Knysna show that there was also a substantial increase in the exports of timber for 1910, as compared with the previous year.

Sale of Fruit Boxes. Fruit growers and others should note, says the *Agricultural Journal*, that it has been decided that the sale of fruit boxes by the Railway Department to farmers in the Transvaal shall be discontinued, it being considered that the time has arrived when supplies of this nature can well be entrusted to private enterprise or to co-operative societies and other agencies.

* * * *

New Building Plans. Eight municipalities in the Transvaal Province during the month of February approved plans having an estimated value of £143,701, as against £140,422 for the month of January, showing an increase of £3,279, and four municipalities in the Cape Province approved plans having an estimated value of £8,994.

* * * *

Production of Butter During 1911. During the year 1911 the several creameries of the Orange Free State turned out 3,056,244 lbs. of butter, valued at £189,858 12s. 11d. The total cream produced at 40 per cent. average amounted to 2,827,463 lbs., valued at £141,373 3s.; 468,170 gallons of milk were sold for local consumption, valued at £15,605 13s. 4d.; 248,032 gallons of fresh milk, worth £8,184 9s. 8d., were sent out of the Free State; whilst the value of milk for cheese production and of cheese manufactured amounted to £454 6s. 8d. and £85 17s. 6d. respectively. Of skim-milk at 90 per cent. 6,876,549 gallons were produced, valued at £3,581 10s. 8d.; whey at 85 per cent., 11,585 gls.; and butter-milk, 4,584,366 gls. The quantity of cream at 40 per cent. average sent out of the Orange Free State was 76,843 lbs. These figures do not include goats' milk, milk used on farms for domestic purposes, or feeding of calves; and the figures relating to butter production do not include home-made or farm butters made for sale or domestic purposes.

* * * *

Railways and the Coal Industry. In the Assembly last week, Mr. Fawcus (Umlazi) asked what steps the Government would take to provide for the heavy traffic of coal from the coalfields in Natal in view of the shortage of trucks, and whether the Minister would contemplate the possibility of reducing the present rates on coal exported from South African ports. The Minister of Railways replied, in regard to the latter part of the question, that he had made an announcement some days back, and the Government had in contemplation the reduction of rates. The question of coal would be considered at the same time, and further information be given later on. As regards the other part of the question, that affected all the other ports and even Delagoa Bay. He would say that of late a very great advance had been made, and whereas formerly it took four days to bring the coal from the coalfields to Durban that time had now been reduced to twenty-three hours. All possible facilities had been provided to get the coal as quickly as possible to the ports. Unfortunately just at present, owing to the strike in England and owing to other reasons, the demand for coal was very heavy, but the Administration was doing its utmost to comply with the demand, and Mr. Hoy had informed him that considering the extraordinary pressure and the suddenness of the present conditions they were doing very well. The most urgent needs were being supplied, but, of course, they had only a limited quantity of trucks, though they were getting more rolling-stock. He was, however, pleased to say that there was no great delay, and he recognised that the present opportunity should not be missed. Mr. Henderson pointed out that the colliers in Durban often had to wait for days and days before they could get their coal aboard. He was, however, pleased to state that there had been considerable improvement in the last few days.

Empire Trade.

In the annual report of the Royal Colonial Institute the following interesting reference is made to the all-important subject of Empire trade:—

For some time the Council has had under consideration the question of identifying itself in a more active manner with the furtherance of Empire trade and industrial interests, and a representative committee has been formed to carry out the Institute's work in that direction. The work of the committee includes the arrangement of industrial conferences with a view to regulating and co-ordinating Empire trade conditions, and by means of lectures at the Institute itself, and before the Chamber of Commerce and trade bodies throughout the country, and in other ways to make more widely known the opportunities that exist in the oversea dominions for British trade and capital, and, on the other hand, to place the British merchant and manufacturer in touch with the sources that are available within the Empire for the supply of raw materials and other products. The work of the committee has received the support and co-operation of the Governments of the various Dominions and oversea possessions, who have undertaken to supply to the Institute their reports and other documents affecting Empire trade and industry. The following subjects have already gained the attention of the committee, and formal resolutions thereon have been forwarded to the President of the Board of Trade and the Secretary of State for the Colonies, and otherwise dealt with:—1. Uniformity of Company Law within the Empire. 2. The work of the British Consular Service in regard to Empire trade. 3. The establishment of through bookings of goods by sea and land from one part of the Empire to another. 4. The issue of popular handbooks setting forth the resources and trade conditions of the Crown Colonies and Dependencies. 5. The necessity of taking some definite action to develop the resources of and British trade with India and the Crown Colonies and Dependencies by the appointment of Trade Commissioners, as has already been done in the case of the self-governing Dominions. The representations which the committee have made in connection with some of the foregoing matters have already met with a measure of success. The broadening of the work of the Institute generally in such respects will, in the opinion of the Council, prove of practical value to all concerned in the improvement of the Empire trade and industry.

* * * *

Bank Combine.

It is understood that the basis of the amalgamation of the National Bank and the Bank of Africa has been agreed upon by the controlling bodies of the two institutions. It is stated that the amalgamation will partake of the nature of an absorption of the latter corporation by the first named. It is also rumoured that the Natal Bank will come into the combine at an early date, and that the negotiations between the boards of management of the various parties are almost complete.

* * * *

A New Fire Extinguisher.

The "Rectus" fire extinguisher, for all outbreaks of fire particularly caused by petrol or other inflammable material, is now on the market. Colonel R. P. Macdonald, D.S.O., P.O. Box 5557, Johannesburg, Transvaal, South Africa, is now booking orders for these, and is prepared to consider special terms on application. Endeavours are being made by Colonel Macdonald with various insurance companies to obtain a reduction of premium on the insurance policies of all cars and motor cycles which carry the "Rectus." The extinguisher promises to be invaluable in mine hospitals, engine rooms, and recreation halls. Colonel Macdonald certifies that at a demonstration given in the yard of the fire brigade at Johannesburg, at which he and many others were present, that a wooden tub, about 2 ft. 6 in. in diameter, coated with coal tar inside, into which a gallon of petrol and a gallon of paraffin was poured and sprinkled round on an asphalte floor, was set fire to and almost immediately extinguished with one of these "Rectus" extinguishers.

The Publicity Manager of the Union Railways has returned from Europe and America, having made a thorough study of railway advertising in these continents.

The Exchequer receipts for February total £2,021,351, or, including loan account and the opening balance, £4,531,200. For the period since April 1, the total including loan account, was £26,576,894. The issues for the month of February were £953,670, or, including loan account, £1,035,670. The issues for the 11 months, including loan account, total £23,039,039. The Exchequer balance at the end of February was £3,495,529.

Pebble Efficiency in Tube-Milling.

By A. W. Allen.

The question of the efficiency of pebbles of various sizes in tube-milling is an open one. In the earliest application of these machines for sliming gold ores at Kalgoorlie it was a common practice periodically to overhaul the contents of the mills and to reject the smaller flints. Some advantage evidently accrued, although the question was not discussed, and there was a want of unanimity of opinion as to the advantages gained by the operation.

The bulk of the sliming action in tube-mills results from the direct impingement of the pebbles, one upon the other. This is also the easiest action to consider theoretically. If it be supposed that the contained pebbles in a tube-mill are perfect spheres of 1, 2, 3, and 4 in. diam, their respective masses are in the ratios of 1, 8, 27, and 64; and since the velocity at point of impact would practically be the same in each case, the available energy can be roughly estimated as follows:—

(1) At point of impact,

Diam. of pebbles.	Momentum ratio.	Energy ratio.
1 inch	1v.	1
2 ,,	8v.	8
3 ,,	27v.	27
4 ,,	64v.	64

(2) Assuming one point of impingement per pebble, in each cubic foot,

Diam. of pebbles.	Points of impingement.
1 inch	1728
2 ,,	216
3 ,,	64
4 ,,	27

(3) Energy ratio times frequency equals composite efforts per unit volume,

Diam. of pebbles.	Energy ratio.	Frequency.	Unit of effort.
1 inch	1	1728	1728
2 ,,	8	216	1728
3 ,,	27	64	1728
4 ,,	64	27	1728

In place of a statement of simple facts the above details may seem laboured, but the idea is to emphasise the utility of the smaller, as well as the larger, pebbles. A composite equality of available energy per unit volume does not, however, necessarily imply identical performance with pebbles of any size, under all conditions. Fracture, and resultant effect, will depend on the friability of the ore as compared with the size of the particles to be broken and the momentum of the mass that is expected to break them. Present-day tube-mill practice indicates that a cylindrical mill operates with a mixture of pebbles of all sizes below 4 or 5 in. diam., with the exception of a proportion of the smallest, which are periodically discharged with the pulp. Attention is seldom paid to the question of feed, but it is evident that efficiency is sacrificed if the material fed contains a proportion that is too coarse even to be fractured by the smaller pebbles; that is, energy is being lost if any individual impact is unproductive of result.

Under these conditions a reduced feed often indicates an improved efficiency, the probable reason being that, with the full feed, coarse sand is found even at the discharge end of the mill, and, in consequence, the smaller flints have no opportunity for doing useful work on particles of ore proportionate to their size. By lowering the feed the coarse sand may be uniformly reduced in the first half of the mill. The smaller pebbles in the second half then have an opportunity of doing useful work in return for power expenditure. From which may be inferred that an efficiency with regard to feed-volume is strictly relative to the grade of ore being introduced.—"The Mining and Scientific Press."

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Automobile Notes.

The T.A.C. Racing Season.

The Transvaal Automobile Club open their season with the competition for the shield presented by Mr. Ernest Lezard, on April 7th, on which day the route, as selected for the contest, from Johannesburg to Warmbaths, via Pretoria, will be traversed. Competitors stay overnight at Warmbaths, and return the following day to Johannesburg. The rules and regulations of the contest, as furnished to members, are mostly similar to the conditions governing former events, a few extracts bearing on the main points, briefly referred to, follow: Cars will start from, and finish at, the Orange Grove tram terminus, and with the exception of the compulsory half-hour control at the Transvaal Hotel, Pretoria, a non-stop run each day must be accomplished to qualify a competitor as a prize-winner. Petrol being carried will be gauged by the Club officials before the start, and the amount consumed throughout the trip ascertained at the close of the competition. No adjustment of any nature is allowed in any control, and this provision equally applies while cars are actually competing. Repairs to punctures, however, may be repaired en route, provided the engine is kept running, but not within the controls. A maximum average speed of 30 miles per hour, and a minimum of 18 miles per hour must be observed by all competitors. The regulations further have regard to the observance of the rules of the road; therefore, no car shall attempt to pass another without due warning, and others in turn must allow faster cars to pass them, where the conditions of the road permit. Due respect and consideration is also expected in regard to municipal speed limits. Competing cars must be in regular touring condition, and carry passengers consistent with the respective seating accommodation; in other words, over-crowding is discouraged. The winning cars will be decided on a formula, based on total weight of car, miles per hour, petrol consumed, and horse-power. A prize will be awarded by the Club for the competitor making the fastest time outside the formula. The distance for the round trip is approximately 180 miles. For those unacquainted with the route a strip map has been compiled, and can be had on application to the Club secretaries. As the competition is confined to amateur members of the T.A.C. some interesting running is expected. It is hardly necessary to point out that a large entry will augur well for future events, and should be assured, having regard to the fact that a special inducement attaches to this opening event, in that the Lezard Shield is a new trophy, being for the first time offered in competition.

The Forthcoming Show.

As the date of the opening of the Agricultural Show draws near, it is hoped that those responsible for the motor section in the show will give this matter the measure of attention necessary to the success of such an exhibition. The field of possibility at this advanced stage of the motor industry in South Africa very considerable, and the opportunity afforded the motor traders to reach certain classes of the community, who in the ordinary way are not brought into actual touch, in the daily routine of their vocations, with the motor vehicle, must be patent to all. Large numbers of visitors will be attracted, during Easter week, from country parts to the annual agricultural event,

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and a thoroughly representative exhibition of motor vehicles cannot fail to appeal to a public intent on sight-seeing, in any way other than gratifying. For the information of those who advance the argument that the holding of motor exhibitions in these parts is premature, and who are probably unaware of the immensity of the automobile trade, it will be interesting to remark that last year South Africa purchased motor cars to the value of £372,826, and motor cycles to £74,194, figures which at once clearly justify any attempt made to organise an exhibition, in the nature of that being held on the 10th, 11th, 12th, and 13th prox., in conjunction with the Agricultural Show.

A Noteworthy Show.

The North of England motor show, recently held at Rusholme, a suburb of Manchester, was most representative of the present day industry, the selection of cars comparing favourably with that of Olympia, and numbering some 300 touring cars and chassis, ranging in price from under £200 up to £1,500. The growth of the commercial vehicle industry was also unmistakably demonstrated, the exhibits being very comprehensive. Nearly all the well-known British, American and Continental cars were displayed by the respective North of England agents, and some altogether new models were subjected for the first time to public criticism. The success of the show was assured from the outset for several reasons, one owing to the fact that it was held in one of the richest districts in the world, and also at a time of the year when the purchase of a car is being freely contemplated by so many. On the whole the venture was acclaimed by all to be the finest show that has ever been held in the Provinces.

Motors for the Doctors.

In connection with the South African Medical Congress, which will be held in Johannesburg next month, it is proposed that the delegates should visit various municipal works during their stay here. In his capacity as Mayor, the President of the T.A.C., Mr. J. Dowell Ellis, has made a request that members should kindly assist in this direction by providing motor cars for the purpose of conveying the delegates to such municipal works as it may be decided to visit. Having in view the reputation Johannesburg has acquired in the past on the score of hospitality to visiting bodies, doubtless the request of the Mayor, in this instance, will be readily acceded to.

The Question of Roads.

Lecturing recently before the Royal Institution on the past, present, and future of roads, Sir J. H. A. MacDonald gave some instructive and interesting information relative to this most widely discussed subject, which may be wisely digested by those responsible for the road system obtaining in South Africa. This recognised authority drew attention to the ever increasing strain which is being brought to bear on roads by the volume of vehicular traffic, which is also ever increasing, and dwells on the great importance of the weight-bearing nature of the road crust, remarking that, despite many types of mudless and dustless surfaces, it had become universally recognised that the effective road of the future must be a truly bound road, in which stone, whatever kind is used, must be held together by some pitchy or bituminous material, through which water will not be able to find its way. It appeared, in the lecturer's view, that if a satisfactory binding substance is employed, it is unnecessary to use any but quite small stones for the top dressing, and he also laid stress on the advantage which lay in treating roads with a thin film of some resilient material upon the top of the waterproof surface, and recommended the employment of bitumen to this desired end.

The Vauxhall Car.

In the Swedish winter race from Stockholm to Gothenburg and back (600 miles), the Vauxhall car secred a remarkable success in this classic event. Starting second and eighth, the two Vauxhalls quickly secured the lead, were first and second at the half-way mark, and finished at Stockholm in the same order, arriving there one hour and a quarter ahead of the next nearest competitor. The terrible severity of the weather, and the difficulty of the ice-bound course, probably account for the fact that no British car had ever before competed in any of the previous contests held yearly since 1906. During this year's race the temperature stood at 50 degrees below freezing point. There were altogether forty-one competitors A speed contest was also held on a frozen lake, and the two Vauxhalls were easily first and second in their class. Taking all classes, only one car—a 60 h.p.— made better time than the 20 h.p. Vauxhalls, the difference, however, being only 2/5ths of a second. It may be of interest to remark that during the current month the local Vauxhall agents have placed no less than seven 20 h.p. Vauxhall cars, which fact is very significant from the point of view of the increasing patronage being extended to high grade British manufactured machines.

The Riley.

Another British machine, the Riley, is earning an enviable reputation in this country. The 12-18 torpedo model of this type is the product of years of practical experience. The 90 degree engine is a perfectly balanced and remarkably efficient piece of mechanism. The Riley system of gear-changing is in itself unique, enabling the driver to change down from top to low without any "wading through" or jarring of any description. The Riley detachable wheels (patented) reduce the delay caused through a puncture to practically nil. Bosch magneto is fitted as standard ignition on all these most desirable cars.

New S.A. Companies Registered in London.

United Steel Corporation (of South Africa).—Particulars filed February 21. Capital, £250,000, in 247,500 preferred ordinard shares of £1 each and 50,000 deferred ordinary shares of 1s. each. Registered in Transvaal on November 15, 1911. British address: 34 Bishopsgate, E.C., where A. D. Owen is authorised to accept service.

Turner Brothers (Africa).—This company was registered on February 26 with a capital of £10,000 in £1 shares, to carry on the business of preparers, spinners, doublers, manufacturers, dyers, printers and finishers of asbestos, cotton, wool, silk, hemp, flax, etc. Private company. The number of Directors is not to be less than three, nor more than nine. The first are S. Turner, H. Turner, C. H. Turner, F. Turner, S. Turner, jun., and H. R. Turner. Qualification, 100 shares. Remuneration as fixed by the company. Registered by Jordan and Sons, Limited. 116,117, Chancery Lane, W.C.

Rhodesian Central Gold Mining Company.—Registered February 24. Capital, £50,000 in 10s. shares. Objects: Gold and general miners, prospectors, explorers. metallurgists, agents, financiers. dealers in precious metals and stones, etc., in Rhodesia, South Africa, or elsewhere, and to adopt an agreement with the N.E. Syndicate, Limited. Minimum subscription, seven shares. First Directors (not less than two nor more than seven): H. W. Dawson, Col. H. Fludyer, R. H. Tongue, and W. Powell. Qualification. 200 shares. Remuneration, £100 each per annum (Chairman £150) and a percentage of the profits. Registered office, 51, Moorgate Street, E.C.

Brangwin, Clark, and Co.—This company was registered on February 23, with a capital of £30,010 in 30,000 preference shares of £1 each and 200 shares of 1s. each, to carry on the business of agents, brokers, factors, and financial agents, warehousemen, clothiers, drapers, outfitters, storekeepers, and universal providers, to acquire the business carried on in London, South Africa, and elsewhere, as Brangwin, Clark, and Co. Private company. The number of Directors is not to be less than two nor more than eight. The first are R. A. Brangwin, J. E. Clark, F. J. Clark, W. H. Sydenham, W. Abbatt, and R. K. Clark. Qualification. 100 ordinary shares. Remuneration (except Managing Director), £100 per annum. Registered by Welch and Co., Pinners Hall, Austin Friars, E.C.,

Contracts Open.

For printing and supplying the Union and Cape Provincial Estimates of Revenue and Expenditure, 20th March; for conveyance of mails between Barkley East and Clifford, 26th March; Griquatown and Glenlyon, 15th March. In "Gazette," 13th February. Receivable until the above-mentioned dates.

For the erection of a bridge over the Tyumie River, Alice, Victoria East Division, 22nd March; for the supply of hats (or helmets) and caps to the Department of Posts and Telegraphs, 29th May; for the supply of Edison Lalande Cells, 20th March; for supply and erection of two electric passenger lifts for the New Law Courts, Capetown, 10th May. In "Gazette," February. Receivable until the above-mentioned dates.

For purchase of certain scrap material at Capetown. In "Gazette," 1st March. Receivable until 27th March.

For erection of bridge over Groote River, Steytlerville. In "Gazette," 1st March. Receivable until 27th March.

For the erection of Teachers' Quarters at Zendelsfontein, -Wolmaransstad District, 22nd March; for the erection of Police Post at Mooifontein (Diamond Diggings), Bloemhof, 20th March; for the supply of rations to the Transvaal Volunteer Department, 13th March. In "Gazette," 27th February. Receivable until the above-mentioned dates.

For erection of bridge over Klein Yokeskei River, Boschkop, District Pretoria. In "Gazette," 1st March. Receivable until 29th March.

For additions to Bezuidenhout Valley School, Johannesburg. In "Gazette," 1st March. Receivable until 29th March.

For the conveyance of mails between Somkele and Nongoma, Hlabisa, and Ingwavuma. In "Gazette," 6th February. Receivable until 20th March.

For erection of Union Bridge over the Umzimkulu River, between Natal and Cape Province. In "Gazette," 16th February. Receivable until 20th March.

For erection of bridge over the Groot Vel River, District Winburg. In "Gazette," 16th February. Receivable until 18th March.

For renewal of superstructure, Deepdale Bridge, Umkomaas River. In "Gazette," 1st March. Receivable until 26th March.

The Secretary of the Tender Board, South African Railways Headquarter Offices, Johannesburg, invites tenders for the supply and delivery of structural steelwork, required for new store at Pretoria (April 23).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of rations to the Native Police in Johannesburg, Germiston, Boksburg, and Krugersdorp Districts for the period of six months from 1st April, 1912 (March 27). Also, for the supply of boots, leggings, and waterproofs required for messengers in the Public Service, except the Posts and Telegraphs Department, from 15th April to 31st March, 1913 (April 3).

The Chairman of the Tender Board, Provincial Secretary's Office, Market Street, Pretoria, invited tenders for the following services:—Erection of Isolation Ward, Krugersdorp Hospital; additions to City and Suburban School, Johannesburg; erection of school for 64 pupils, at Modderbult No. 328: erection of school for 100 pupils, Pilgrims Rest; additions to school at Benoni; additions to Good Hope School, Fordsburg (April 12).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the following servicts:—Supply and delivery of sanitary fittings and materials to the Colonial Offices at Pietermaritzburg (April 3); supply and delivery of survey and drawing instruments and architects' requirements to Public Works Department Offices, Pretoria (March 27); erection of Police buildings at Louws' Creek (April 3): erection of new nurses' home at Pietermaritzburg Asylum (April 17).

The Secretary, Rand Water Board, Corner House, Johannesburg, invites tenders for the supply of about 14,000 feet of 18-inch steel pipes and specials (March 26).

The Municipal Council of Johannesburg invites tends for the supply of rolling doors, coal (Lighting Works), cable cleats, deals, coal, uniforms for inspectors; also for the supply and delivery of transformers (April 3).

The Municipal Council of Salisbury, Southern Rhodesia, invites tenders for materials to be supplied and work to be executed in the Makabusi Storage Reservoir, including earthen embankment, overflow weir and channels, concrete valve tower and footbridge, etc. (April 16).

Tenders Accepted.

The Municipal Council of Johannesburg has accepted the following tenders, viz:—Messrs. Siemens, Ltd., for the supply of 200 25ft. poles at 34s. 9½d. each, £347 18s. 4d.; Messrs. H. Davies & Co., 100 24ft. poles at 36s. 6d., £182 10s., 100 27ft. poles at 61s., £305, total, £487 10s. Messrs. Reunert & Lenz for the supply of a spare rotor for turbine plant at the Power Station, £850. Messrs. Henderson & Gordon, amounting to £54,969, for erection of New Market Buildings, Newtown. Messrs. E. H. Adlington & Co. for printing the Council's Minutes and Agenda and Statistics. British General Electric Co. for supply of 1,510 feet copper bus-bar at 10d. per lb. Baerecke & Kleudgen for the supply of 6,000 bags of cement, at £5 7s. 3d. per ton. Messrs. Sykes & Co., for the supply and fixing of an additional four overhead rails for ox carcases, with eight sets of points in the eastern portion of the Cooling Hall, and two running rails with the necessary points in the eastern extension of the Slaughter Hall, amounting to £106 15s. Mr. E. L. Whitehorn for the supply of 2,000 dust bins, at 16s. 6d. each. That of the Neuchatel Asphalte Co., for 10 tons of bitumen. Messrs. Dunbar & Co., for the construction and completion of animals cages at the Zoo, a total of £1,121, including quarrying and using granite. Messrs. Nicholls & Alderson, amounting to £8,547 16s., including 5 per cent. for contingencies, for erection of married quarters at Central Fire Station, Johannesburg. Messrs. Wade & Dorman, Ltd., for the supply of rolled steel joists to specification, at 1¾d. per lb., approximate total value, £93 7s. 7d. Neuchatel Asphalte Co., 10 tons of bitumen, at £19 10s., £195 H. Barder & Co., 5,000 porcelain insulators for "span-wire" construction at 3s.; 5,000 ditto for "bow-string" construction at 2s. 6d., £1,375. Siemens, Ltd., 100-1,500 amp. isolating links at £2 8s. 6d. each, £242 10s.; 200 single-pole knife switches at 30s. each, £300; one 14 h.p. repulsion motor with centrifugal short-circuiting arrangement, £59 11s. Telegraph Manufacturing Co., 290 feet copper bus-bar at 9⅜d. per lb. The Eclipse Brick Co., for the supply of 120,000 bricks, at 62s. 6d. per 1,000 be accepted, total value, £375. Messrs. Reunert & Lenz for the supply, erection and delivery of a Belliss & Morcom turbine and condensing plant, with a 3,000 k.w. 2-phase "Siemens" alternator, for the sum of £13,651, including spares. Messrs. Stewarts & Lloyds, for the supply of 15,000 ft. ¾in. galvanised pipe, at 2 3/16d. ft., £136 14s. 4d.; 100 ½in. bibcocks with unions, at 2/2, £11 5s.; 500 ¾in. stopcocks, at 3/- each, £75; 50 3in. bends, at 416 each, £11 5s.; 500 ½in. bends, at 3d. each, £6 5s.; 100 ¾in. tees, at 3.3d. each, £1 7s. 6d.; 500 ¾in. sockets, at 1.05d. each, £2 3s. 9d., total estimated amount, £244 0s. 7d. Mr. H. Ainsworth, for the supply of 50 2½in. fire hydrants, at 37/6 each, £93 15s.; 250 ¾in. bibcocks, at 1/9 each £21 17s. 6d.; 200 ¾in. bibcocks, at 2/8 each, £26 13s. 4d.; 500 ½in. stopcocks, at 1/10 each, £45 16s. 8d.; 100 1in. stopcocks, at 4/1 each, £20 8s. 4d.; 25 3in. barrel nipples, at 9d. each, 18s. 9d.; 12 4in. barrel nipples, at 1/4¼ each, 16s. 3d.; 75 3in. sluice valves, a 24/- each, £90; 50 ½in. tees, at 3¼d. each, 13s. 7d.; 500 ½in. elbows, at 3¼d. each, £6 15s. 5d.; 500 ¾in. elbows, at 4¼d. each, £8 17s. 1d.; 500 ½in. plugs, at 1.2d. each, £2 10s.; 200 ¾in. plugs, at 1.4d. each, £1 3s. 4d.; 500 ½in. barrel nipples, at 1½d. each, £3 2s. 6d.; 300 ¾in. barrel nipples, at 2d. each, £2 10s., total estimated value, £325 17s. 9d. Messrs. Oldbury & Smith Bros., for the supply of 200 pairs springs, at 3⅛d. per lb., approximately £329 8s. 7d.; 100 circle plates, at 3¼d. per lb., approximately £41 19s. 7d., total amount approximately, £371 8s. 2d. Mr. B. J. Penny, for the supply of 50 sets globe scrolls, at 15/6 per set, £38 15s.; 300 pairs S.C. travellers and hooks, at 3/3 per pair, £48 15s., total amount £87 10. United Engineering Co., for the supply of rolled steel joists and channel iron, at 1 11/16d. per lb. J. B. Meikle & Co. for supplying and fixing to existing frames 55 (more or less) sun blinds, single 12/6, double 25/6. Messrs. Stewarts & Lloyds for the supply of 1,500 ft. 5in. piping, for the sum of £150. The Eclipse Brick Company for the supply of 30,000 bricks for abbatoirs, at 60/- per 1,000; 8,000 bricks for Burghersdorp, at 62/6 per 1,000; 30,000 bricks for End Street Store, at 62/6 per 1,000, total value £208 15s. The Union Electric Co., for the supply of 100 s.p. oil switches, at £4 4s. each, total value, £420. The S.A. General Electric Co., for the supply of 2,566 yds. No. 19/15 (B. & S.) underwriter's wire, at 9d. lb., £123; 2,333 yds. No. 19/16 (1 B. & S.) underwriter's wire, at 9d. lb., £93 9s.; 1,333 yds. No. 7/14 (4 B. & S.) underwriter's wire, at 9d. lb., £25 1s.; 1,000 yds. No. 8 (6 B. & S.) underwriter's wire, at 9d. lb., £12 12s.; 1,500 yds. No. 12 (10 B. & S.) underwriter's wire, at 9d. lb., £9 6s.; total, £263 8s. A.E.G. Electrical Co., for the supply of 8,000 yds. 7/14 underwriter's wire, at 8.9d. lb., £153 1s. 7d.; 250 No. 21 L.T. insulators at 8½d. each, £8 17s. 1d.; total £161 18s. 8d. Telegraph Manufacturing Co., for the supply of 660 yds. 19/16 underwriter's wire, at 9d. lb., £29 2s.; 3,245 yds. 7/14 underwriter's wire, at 9½d. lb., £80 6s. 4d.; total £109 8s. 4d. Hubert Davies & Co., for the supply of 250 No. 25340 L.T. insulators, at 2/6, £31 5s.; 200 No. 25340 H.T. insulators, at 2s. 6d., £25; total, £56 5s. British General Electric Co., for the supply of 100 No. W. 7261 L.T. shackles, at 9d., £3 15s.; 100 No. 302 shackles, at 1/2, £5 16s. 8d.; total, £9 11s. 8d. Mr. R. G. Campbell Pitt for the supply of 1,500 casks of "Lion" brand cement at £8 per ton of 2,240 lbs., subject to the cement passing the necessary test. Messrs. Baerecke & Kleudgen for the supply of 3,000 bags of "Pretoria" cement at £4 15s. 6d. per ton of 2,240 lbs. For the supply of uniforms for Fire Department officials, that of Messrs. J. Middlemas & Co., for 40 full dress tunics, at 50/-, £100; 40 pairs dress trousers, at 22/- pair, £44; 70 pilot jackets, at 47/6, £166 5s.; 120 Nelson caps, at 4/6, £27; 30 staff caps, at 8/6, £12 15s.; 32 officer's undress D.B. suits, at 64/6, £103 4s.; 16 pairs undress trousers, at 17/6, £14; total, £467 4s. Mr. W. H. Markham, for the supply of 60 undress jackets, at 46/-, £138; 180 pairs undress trousers, at 24/- pair, £216; total, £354. Messrs. W. M. Cuthbert & Co., for the supply of 80 pairs top boots, at 40/- pair £160.

The South African Railways have accepted the tender of Messrs. A. Proudfoot and Co., Johannesburg, of 1s. 10½d. per cubic yard for the removal of Braamfontein Sub-way core.

The Week's Company Meetings.

ANGLO-FRENCH COAL.

Col. Dalrymple's Speech.

The Export Trade.

State Sympathy Wanted.

The tenth general meeting of shareholders in the Anglo-French (Transval) Navigation Coal Estates, Ltd., was held on March 20 in National Bank Buildings, Mr. W. Dalrymple presiding. There were present Messrs. G. R. Airth, Gordon Sandilands, G. W. Higgins, E. J. Way (consulting engineer), E. H. Read, C. W. Southwood, C. P. Marais, H. P. Webber (secretary), and G. W. Austin (transfer secretary), a representation of 159,439 out of 230,000 shares.

The Chairman: The report of your directors, to which is attached those of the consulting engineer and general manager, and the audited statements of account covering the operations of the company for the year ended 31st of December, 1911, are before you for your approval. I am pleased to say that your company has at last entered the dividend-paying stage. The net profit on coal winning for the year amounted to £9,983, and this, together with a balance of £6,880 carried forward from last year, amounted to £16,863, of which £10,500 was distributed among holders of preference shares, £4,500 was set aside to meet depreciation, the cost of any further extensions to the plant, etc., while a balance of £1,863 has been carried forward. The unpaid balance of the cumulative dividend on preference shares at 31st of December last amounted to £34,630, and appears among the contingent liabilities of the company at that date. The output for the year showed a further improvement over that for the year 1910, averaging as it did 19,141 tons per month as compared with 10,239 tons per month in the first half of that year and 17,825 tons per month in the second half.

Difficulties Below.

During the year the continued intrusion of rolls and stones on the floor of the seam, resulting in more expensive winning and the necessity for extensive sorting, with consequent high working costs, and also in a product of lower calorific value was a cause of anxiety to the board. The output of the mine was considerably affected by these difficulties, and as a result during the first half of the year a considerable portion of the orders allocated to us by the Coalowners' Association was unexecuted. During the year the changes in the demands for coal resulted in our placing on the market our duff coal, which had hitherto been dumped. The increase in the output during the year, as compared with that of the second half of 1910, is almost wholly attributable to the sale of this duff, which is purchased by the large electric power stations established on the Witwatersrand. Though the price per ton obtained from the disposal of this coal is low, still, in view of the fact that our alternative is to place the duff on the dump, it follows that the disposal of this product is to the company's advantage. In view of the difficulties experienced, the management decided to explore a seam below that which had been worked, and a connection was established. As the tests of the coal were satisfactory and the width averages about six feet, the board decided to open up this seam. At the present moment we are obtaining about six hundred tons of high-class coal per day from this seam, and as the quality is superior to that of the upper seam, and up to the present we have not been seriously troubled with rocks, those we have met being of soft, shaly nature and easily negotiated, it is intended in the near future to transfer the whole of the workings to this lower seam.

Improvement with Economy.

Provided this development continues as satisfactory as at present, we should obtain a coal of considerably improved quality, while, at the same time, effecting a reduction in the working costs, both on account of better mining conditions, easier tramming and reduced sorting. In the early stages of the development of the new seam, a small quantity of fire damp was met with which caused a small explosion, resulting, I regret to say, in the death of one native labourer. In consequence of this the use of safety lamps is rendered necessary until proper ventilation has been established by further opening up the works on this seam. I find on reference to the Government returns that the sale of coal from Transvaal collieries showed a further increase during the year. The quantity sold was 4,343,680 tons, as against 3,970,069 tons during the previous year. It is, however, regrettable and unsatisfactory to find that the low level of price which had been reached in 1910 has again been reduced by 3.21d. per ton, the average value for 1911 being 4s. 8.39d. per ton. What strikes one in reviewing the whole position is this: that unless export and bunker trade be encouraged the market for coal is a limited one. The collieries have done all they can to foster this external trade, they are selling at bedrock prices, and by co-operation, through the Transvaal Coal Owners' Association, are able to handle it advantageously. The drawback is the cost of railage to the coast.

Government Encouragement Wanted.

If we were in a position to put coal on board ship at a price which would enable it to compete in other markets, the advantages accruing would be general and not confined to the collieries. The railways, instead of taking down empty trucks to the port, would be getting freight and revenue. Then, if it were known that cheap coal could be regularly obtained at the ports shipping would be attracted for the purpose of taking fuel and cargoes, and in this way lower freights should be obtained for South African products. Another advantage would be this, that for export purposes only large coal is required, and there would therefore be an increased proportion of lower priced "smalls" available wherewith to meet the growing demand by local industries for this class of coal. I think, in view of what I have said, that it behoves the railways and harbours board—who, I understand, are at present engaged on a revision of the railage tariffs of the Union—to give special encouragement to the export and bunkering trade by granting a considerable reduction in the coal rates coastwards. No change has been made in the arrangements with the Apex Mines, Limited, under which we ceded to that company the option to lease coal rights on Farm Groenfontein No. 159 in the district of Middelburg. During the year dividends Nos. 1 and 2, payable to holders of preference shares have been declared. These dividends represent in all a distribution of £10,500, equal to 8¾ per cent. You are asked to confirm the action of the directors in declaring these dividends. Mr. G. Sandilands resigned his seat on the board in October last, and Mr. G. R. Airth was, subject to your approval, appointed in his place. You will be asked to confirm this. The board takes this opportunity of expressing its appreciation of the services rendered to the company by the management and the staff of the mine. In August last a settlement on the London Stock Exchange was granted for the shares in the company. It was deemed advisable to obtain this in order to facilitate dealings in the shares. I now beg formally to move the adoption of the report and accounts for the year ended the 31st of December, 1911, and also the confirmation of the action of the directors in declaring interim dividends Nos. 1 and 2 during the year.

The report and accounts were adopted, Mr. Higgins seconding the chairman's motion.

The appointment of Mr. G. R. Airth as a director of the company in place of Mr. G. Sandilands, resigned, was confirmed.

Messrs W Dalrymple, G. W. Higgins, B. Hansford, A. Little, G. R. Airth and C. R. Pinder were re-elected directors.

Messrs. F. W. Diamond and English and Messrs. C. L. Andersson and Co. were reappointed auditors.

Chances of a Better Year.

The Chairman further said he did not think there was any question that shareholders could look forward this year to better results. They had experienced difficult conditions in the working of the seam which did not exist on the neighbouring property. If only encouragement for an export trade was available everybody would be considerably benefited.

Mr. Southwood hoped the chairman's remarks would reach the proper quarter, and suggested that now was the time—during the coal strike—for something to be done.

The Chairman pointed to the lack of native labour even if they were asked to take advantage of what was a passing phase. Extraordinary demands might be made, but having obliged them, the customers would say "Good morning." Through the Coal Owners' Association everything was being done to improve things generally, and to make the coal trade in the Transvaal get its fair share in accordance with the capital invested—a fair share it had not had in the past.

CITY DEEP.

Important Statement.

The annual general meeting of shareholders in the City Deep, Ltd., was called for March 20 in the board-room, Corner House, but by a unanimous vote it was decided to postpone it to the 30th of May at the same time and place.

Mr. R. W. Schumacher, who presided, made the following brief statement: The annual general meeting of this company was originally called for to-day, but, as you are aware, a subsequent notice was issued to shareholders informing them that there would be a motion for adjournment until the 30th of May, in order to enable all shareholders living in Europe to receive and study the reports before sending their proxies. In future all companies connected with the Rand Mines, Ltd., and the Central Mining and Investment Corporation, Limited, will regularly follow this procedure of allowing European shareholders ample time to make themselves acquainted with the annual reports before the meetings are held in Johannesburg. As there will be a delay of over two months before any statement can be made from the chair, I should like to give shareholders the reassuring information now that the company's surface plant is giving entire satisfaction, and that the management is confident that the monthly profits will soon be increased.

LANCASTER WEST.

Labour Costs.

Mining Innovations.

The twelfth ordinary general meeting of shareholders in the Lancaster West G.M. Co. Ltd., was held in the board room, Silesia Buildings, on 20th March, Mr. Neuhaus presiding. Those present included Messrs. M. G. Elkan, H. A. Barsdorf, E. J. Renaud, J. L. Kuhlmann, V. J. Ronketti, W. R. Crowhurst and W. T. Nellist.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: The results for the year ended the 31st of December last, which are given in detail in the directors' report and accounts presented to you to-day, show an increase in the profit obtained from mining, as compared with 1910, of £10,702 at £33.220. The quantity of ore milled was 258,943 tons, or approximately 6,900 tons more than in the preceding twelve months. The yield from this tonnage of 22s. 6d. per ton milled was slightly less than in 1910, but this decline was balanced by the revenue obtained from the treatment of 9,770 tons of accumulated slimes. As regards the future yield, you will see from your consulting engineer's report that, on the basis of the value of the present ore reserves, this is forecasted at 21s. 6d. per ton milled, which, however, should be increased somewhat by the treatment of accumulated slimes. Of course, if developments improve, and, as I show later on, there is reason to anticipate this, this figure will go up. The costs, I am glad to say, at 20s. 1½d., show a reduction of 9½d. per ton. This decrease in costs is perhaps the most satisfactory feature of the year's operations. It was achieved in spite of a large increase in the expense of native labour and the necessity of changing from hand to machine mining. This innovation, which, of course, involved a considerable outlay in providing drills and so forth—all of which expenditure was charged to working costs—was forced on the company by the shortage of native labour. At first the work done with the aid of machine drills, owing to the inexperience of the men handling them, was naturally not quite satisfactory, but by the end of the year the manager was able to report that the results compared favourably with hand stoping as regards costs, while the width of the stopes, and therefore the value obtained per ton, did not suffer. By the adoption of this measure, it was found possible to work the mine with some eight hundred natives less than heretofore. As this means a saving of no less than 30 per cent. of the total unskilled labour formerly necessary, it may be justly said that a revolution has taken place in the method of working the mine. Indeed, as much appears from the manager's statement that, while at the beginning of the period under review only 8 per cent. of the tonnage mined was obtained from stopes worked with the aid of machines, as much as 65 per cent, was being broken by this method at the end of the year.

ACCIDENT RATE.

I think it will be possible to effect a further reduction in costs during the current year, though the requirements of the new mining regulations seem likely slightly to increase expensts and necessitate a small amount of capital expenditure underground. Moreover, there is at present no indication that native labour will become cheaper. As some of the Government measures are inspired by a desire to decrease the number of accidents you may be interested to hear that while in 1911 the accident rate for the whole Rand was 4.10 per thousand, that for your mine was only 1.31 and for the group to which your company being 3.09, only one other group having a better record. In view of the enormous proportion of semi-savage labour employed these rates cannot be considered unsatisfactory, and indicate that on your mine, as well as on the others of the same group, every precaution is taken to prevent accidents. Including the carry forward from 1910, the total amount available was £84,776. Of this £9.206 was absorbed by the debenture service, etc., while £26,638 was applied to depreciation of plant and general equipment, leaving the amount to be carried forward at £48,930, or £5,057 more than in the previous year. The analysis of receipts and expenditure of the company shows that at the beginning of 1911 the cash and cash assets stood at £23,715. A reduction in the investments and the profit before-mentioned increased this amount to £66.699. Out of this sum the debenture debt has been reduced by £10,700, £22.813 has been spent on excess development, while capital expenditure and sundry other disbursements have absorbed £6,206, leaving a credit balance with which to commence the present year of £18,918.

DEVELOPMENT WORK.

A large amount of development work has again been accomplished during the period under review. Owing, however, to the length of the crosscuts necessitated by the heavy faulting in the eastern part of the Battery mine, the amount of ore opened up was disproportionate to the footage driven. Furthermore, the development results in this section of the mine were last year not very satisfactory, but I am glad to be able to inform you to-day that latterly the drive on the 12th level Battery No. 1 shaft has disclosed reef of very good value. The last 45 feet sampled gave an average assay value of 14.6 dwts. over the stoping width of 36 inches, and the reef continues to look well. An important feature of the development work has been that done from the Botha No. 2 shaft on the main reef. Since the close of the year a winze has been started from the 11th level drive, and is still in ore showing good values. This winze is in payable ore, and will be continued. It is quite possible that by this means we shall at length obtain the connection with the workings tributary to Botha No. 3 shaft, on the old Lancaster West Section, which has been so long desired. You will remember that in this section 117,000 tons of payable ore are standing available for stoping as soon as the mining regulation relative to the provision of two outlets to the surface has been complied with. In consequence of the large barren footage necessarily driven in 1911, the cost per ton of the ore opened up in that year has exceeded the development redemption charge. As, however, it is anticipated that this excess will not occur again, it was not thought needful to raise the development redemption charge above 2s. 6d. per ton, as the total payable and available ore reserves, which have been increased by 41,700 tons, still stand in the books at only 2s. 4d., without making any allowance for the 117,000 tons of Botha reef ore aforementioned.

In view of the gradual extension of the workings of the mine towards the east, the board entered into an arrangement with the Government for the acquisition—at the price of £2,090, or £20 per claim—of the mining rights underlying certain water-rights covering an area of 104.5 claims, most of which are situated on the south-eastern boundary of your property. The formal contract embodying this arrangement has not yet been signed.

COST OF THE NATIVE.

On the last occasion when I had the honour of addressing you, I pointed out that the cost of the native had increased very largely, and that apparently the limit had not been reached, and I urged the necessity of immediate co-operation, so as to prepare for the period of scarcity which I felt was bound to recur, believing that co-operation would, after a short period of dislocation, result in obtaining greater numbers of natives at a decreased cost. A year has elapsed, practically nothing has been achieved in the direction of co-operation, the period of scarcity has occurred, and the cost of labour has further increased. Though in the interval the question has been ventilated at a great number of company meetings, the matter is so important to the industry, and particularly to poorer mines, that I think no apology is needed if further reference is made thereto. The increase in the total cost per native labourer, including wages, recruiting, feeding, housing, etc., comparing 1910 with 1909, was 17 per cent., and comparing 1911 with 1909, 26½ per cent. or, comparing 1911 with 1910, 8 per cent. A part of this extra expense is undoubtedly due to the increased cost of feeding, housing, etc., and in so far as that is concerned no objection can be raised, but by far the greater portion thereof is due to the competition for the labourer, which has increased his wages and the cost of procuring him. As a result, the total costs of the mines of the Rand for native labour alone were in 1911 probably £1,200,000 higher than they would have been if the rate obtaining in the first half of 1909 had been maintained, and of this huge sum perhaps £1,000,000 may be attributed to avoidable competition, and could therefore have been saved. The representatives of the groups have met repeatedly during the past year, and many schemes for a solution have been propounded, but so far no solution satisfactory to all parties has been found. I hold very strongly that the only satisfastory method of overcoming the difficulty is to be found in the cessation of competition in recruiting within the Union of South Africa, and that a central organisation should obtain such labour as is available from these territories on behalf of all the groups. I still have great hope that it will not be long before a solution on this basis is found, for, in the end, I think everybody will recognise that this is the best method not only of preventing a further increase but of reducing the present costs. I regret to inform you that Mr. C. R. Davis, who has been the manager of the mine for the last seven years, has resigned his position, and will leave in a few days' time. I should like to place on record that the directors as well as the consulting engineer have always been more than satisfied with Mr. Davis's work, and are very sorry to lose him. He will be succeeded by Mr. A. Tennant, who has hitherto been manager of the South Randfontein Deep. Your thanks are due to Mr. Cameron, the consulting engineer, and Mr. Davis for the good services they have rendered during the past year. Commencing with next year, it is intended to hold the annual meeting of the company at a later date, to enable shareholders to be placed in possession of the annual report and accounts before giving proxies for use at such meeting. In order to enable this procedure to be carried out the articles of association will have to be amended, and a meeting for this purpose will be held at an early date.

The report and accounts for the year were unanimously adopted.

Mr. E. J. Renaud was appointed as director in place of Mr. H. O'K. Webber, resigned, and the retiring directors were re-elected.

Mr. Thomas Douglas and Mr. F. W. Diamond were reappointed as auditors for the ensuing year.

The meeting terminated with a vote of thanks to the chair.

VAN DYK PROPRIETARY MINES.

The seventh ordinary general meeting of the Van Ryn Proprietary Mines, Ltd., ings, on March 20th. Mr. H. Neuhaus occupied the chair, and among those present were Messrs. M. G. Elkan, J. L. Kuhlmann, T. G. Suter, V. J. Ronketti, M. Rode, W. B. Crowhurst, and W. A. Nellist.

The Chairman, in moving the adoption of the report and accounts, said : It has unfortunately not been possible to consider the resumption of mining operations on your company's property. A caretaker is in charge, and the surface works are being maintained in such a condition that, when the necessary funds are provided, work can be resumed with very little delay. The administration expenses have amounted to only £1,544, as compared with £3,621 in 1910, while £4,330 for interest, and other disbursements, including loss on the sale of stores, etc., increased the outgoings to £6,846. Against this sum a revenue of £409 has been received. Owing to the realisation of certain assets, however, the indebtedness of your company was only increased by £1,500, the total amount of the loan at the end of the year being £75,580. Commencing with next year, it is intended to hold the annual meeting of the company at a later date, to enable shareholders to be placed in possession of the annual report and accounts before giving proxies for use at such meeting. In order that this procedure may be carried out the articles of association will have to be amended, and a meeting for this purpose will be held at an early date.

The report and accounts were adopted.

The retiring directors, Messrs. Amandus Brakhan and Clement Davies, were re-elected, and Messrs. F. W. Diamond and English and C. L. Andersson and Co. were reappointed auditors for the ensuing year.

MAY CONSOLIDATED.

The Question of Life.

The twenty-sixth ordinary general meeting of the May Consolidated G.M. Company was held on March 20 in the boardroom, Silesia Buildings. Mr. H. Neuhaus presided, and others present were Messrs. M. G. Elkan, W. Ross, W. Dalrymple, J. Munro, G. C. Fitzpatrick, H. W. Anderson, J. L. Kuhlmann, V. J. Ronketti, P. Richardson, J. Barry, and W. M. Tudhope (secretary), representing 35,343 out of 288,750 shares.

The Chairman's Speech.

The Chairman said: In submitting the directors' report and accounts for the past year I am glad to say that the results have again been very satisfactory. In spite of the difficulties inherent in working a mine fast approaching exhaustion—of which more later—and of a constant struggle for an adequate supply of labour, the quantity of ore crushed was increased from 180,855 to 184,470 tons, and this notwithstanding that the percentage sorted out rose from 9.81 per cent. to 10.915 per cent. In practically every department of work the costs were decreased, not only per ton, but absolutely, which argues great efficiency all round, particularly as the expenses in connection with unskilled labour were higher per shift even than in 1910, which, you will remember, already gave cause for complaint. Unfortunately, this reduction in costs was more than counterbalanced by a fall in the grade, so that the working profit shows a decrease, as compared with 1910, of £9,301. Nevertheless, the dividend was maintained at 40 per cent., and the carry forward slightly increased to £33,853. In this connection, you will observe that the depreciation charge has been reduced from £5,332 to £768.

END OF THE MINE.

Your directors are of opinion that, in view of the approaching end of the life of the mine, it is better to keep the balance to the credit of profit and loss account more in accord with the balance of cash assets—which, you will note, totalled on the 31st of December, £48,342, after allowing for all liabilities—than to write down the book value of your plant further, particularly as the plant cannot be written down to its breaking-up value. The development of the property has now been completed. Last year you were informed of the intention once more to prospect the so-called south series, and from the reports before you it will be seen that this was thoroughly done during the period under review, without, however, giving the desired results. The payable ore reserves indicate a life of only fourteen months from the 1st of January last, but, as your consulting engineer points out, the probability is that a considerable tonnage not included in the declared reserves will be milled, and that the life will thereby be extended for several months longer. On the other hand, as the quantity of the ore reserves decreases the places of attack will naturally become fewer, rendering it impossible to crush a regular tonnage each month. The profit will be affected accordingly, and will also be adversely influenced by the fact that the declared ore reserves will be mixed with an increasingly large proportion of lower grade rock. You must, therefore, expect variable and, on the whole, decreasing monthly profits.

PROFIT OF THE YEAR.

Your consulting engineer points out that it is difficult to frame an estimate of what the total profit for the current year will be, but he puts it at £38,000 for the first six months, of which January and February have already accounted for £14,155. The fact of the early exhaustion of the property has resulted in several proposals being made to your board, with a view to acquiring an interest in various other concerns. These proposals have, of course, all been considered, but so far nothing sufficiently promising has been offered. It now only remains for me to place on record your directors' appreciation of the excellent services rendered during the past year by your consulting engineer, Mr. W. McC. Cameron, and your manager, Mr. K. H. Sartorius, to whom your best thanks are due. Commencing with next year, it is intended to hold the annual meeting of the company at a later date, to enable shareholders to be placed in possession of the annual report and accounts before giving proxies for use at such meeting. In order that this procedure may be carried out, the articles of association will have to be amended, and a meeting for this purpose will be held at an early date. I now beg to move, "That the directors' report, together with the statements of account for the year ended the 31st of December, 1911, be, and they hereby are, approved and adopted."

The motion was adopted.

Messrs. W. Dalrymple and S. B. Joel were re-elected directors, and Messrs. F. W. Diamond and W. Bickell were reappointed auditors.

RAND NUCLEUS.

A Waiting Policy.

The annual general meeting of the Rand Nucleus Gold Mining Company took place on March 20 at Exploration Buildings, Mr. H. O'K. Webber presiding. There were also present Messrs. R. M. Connolly, E. Friedlander, J. Jourdan, A. Gregor, W. E. Spackman, representing 73,703 shares out of a total issued capital of £260,000.

In moving the adoption of the report and accounts, the Chairman said: The report of your directors, which you have taken as read, is on the table, and with it you will find the balance sheet for the year ended the 31st of December, 1911. You will see that the expenditure for the year amounted to £1,134 18s. 3d., while the receipts amounted to £750 5s. The excess of expenditure over revenue was therefore £384 13s. 3d. At the end of the year we possessed, as an investment "at call" in Europe, the sum of £25,092 10s. 3d.; but I regret to say that the interest derived does not cover our annual expenditure, most of which consists in the payment of claim licences on the 267 claims of the company. I have nothing very hopeful to tell you in regard to the immediate future of your property. At the present market price of the shares, the value of the claims is scarcely taken into consideration, since you have in cash nearly two shillings per share. Though your property carries the main reef, yet it is surrounded by neighbours who, though nearer the outcrop, do not appear disposed to develop their properties. The time will assuredly come, however, when all the claims in the neighbourhood of the Rand Nucleus will be amalgamated and worked as one large proposition. In the meantime we can only await events.

The report and accounts were adopted, and auditors and retiring directors were re-elected.

Our Twenty-First Anniversary Number.

THE LAST WORD ON RAND MINING.

To commemorate the twenty-first anniversary of the founding of this journal, a special number, distinct from the ordinary weekly issue, will be published at the end of next June. Fittingly to mark the occasion, the number will contain a comprehensive and concise account of the past history, achievements and present position of every gold mine on the Rand, illustrated and brought down to the latest possible date. It will review the industry generally as well as in its several technical aspects, and will include articles by experts on the chemical, mining and metallurgical progress and problems of the fields. A feature will be made of the personal side of the industry, and a section will be devoted to its technical and administrative leaders, enriched with portraits and other illustrations. Engineering on the Rand in all its phases, electricity, steam and air power will be treated, and the growth and progress of electric power supply will be exhaustively discussed. The gold mines of the outside districts and the tin, copper and coal industries of those districts will be dealt with thoroughly and at first hand. The great diamond industry of South Africa will have a section to itself, and here, as in the treatment of the base metal industries, the letterpress will be embellished with many striking and original illustrations. Mining in the Cape, Natal and Orange Free State Provinces will also be reviewed and the undoubtedly great mineral potentialities of those, as yet undeveloped, areas will be graphically set forth. German South-West Africa will find a place in the issue and a first-hand account of the diamonds, the copper and the tin mines of that promising field will be included. Moreover, the banks and other great financial institutions, the railways and harbours of the sub-continent will be adequately dealt with, and the whole problem of transportation as it affects the inland industrial centres will be reviewed. In this connection Capetown, Port Elizabeth, Durban, East London, Delagoa Bay and Beira will be separately and fully treated and their claims examined. Apart from mining, there will be a considerable section devoted to a description of the several subsidiary industries dependent on mining for a market. Chief among these will be cement, explosives, soap and candle-making, milling and the hundred and one activities that centre in the Rand. Rhodesia and Mozambique will be given a separate and extended treatment. The different mines will be described and illustrated, and the recent progress of the industry in those territories dealt with comprehensively and lucidly. In addition, the issue will contain a number of interesting and valuable contributions from leading men in the mining and financial world, many of whom have already sent their congratulations on the decision to issue a special commemorative number of the journal. Numerous letters received from past Rand engineers and mine managers, now resident in all parts of the world, contain offer of contributions. These will form a unique collection of valuable views and reminiscences, and will considerably enhance the interest of the volume. The work will consist of upwards of 350 pages, printed throughout on art paper. Prizes are offered to artists for the best design of a suitable and striking character, and particulars are given in another part of this issue of other valuable prizes to be awarded in connection with the number. It may be added that the work will be prepared, produced and printed in South Africa, and will aim to cover the whole field of mining in this country, and to prove a fitting monument to the great industry with which, from the beginning, the *South African Mining Journal* has been associated. The co-operation of everyone interested in the industry is being enlisted to make the venture a success, and already it promises to mark an advance on anything of its kind ever before attempted in South African illustrated journalism.

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Notes and News.

The New Phthisis' Compensation Bill.

The new Phthisis' Compensation Bill promises to provide the sensation of the next few days. With a view, no doubt, to giving the public time to digest the Phthisis' Commissions' Report, the Government is not publishing the new Bill until the former has had some days start. Of course, any measure drafted by a department in the white heat of newly-roused enthusiasm for the cause of the disease-stricken is bound to err, if anything, on the side of eleemosinary prodigality at other people's expense. We understand that the new Bill, in the rough, may entail an appalling expense to the industry, and, were we not assured of its being hammered into a more practicable measure in the course of its progress through the Cabinet and Parliament, there would be reason to fear its effect on the industry. Any addition to working costs would be particularly unfortunate at this stage, and it is to be hoped that the Government and its advisers will consider carefully the important and far-reaching issues raised by any hasty proposal to magnify the burdens of Rand enterprise. People talk glibly of putting an impost of threepence or fourpence a ton on the tonnage crushed, forgetting the demoralising effect which an impost would have on the mines, necessitating, perhaps, the closing down of the poorer ones, and substantially reducing the profit-earning capacity of all. The Government ought to know that "The goose that lays the golden eggs" was never more in need of sympathetic treatment than now.

* * * *

Randfontein Changes.

Randfontein changes continue to be the topic, and the latest unofficial reports credit Mr. J. W. S. Langerman with having handed in his resignation. Mr. Duncan, the financial adviser of the group, has resigned, likewise the general managers, Messrs. A. D. Bacon and C. B. Horwood, who left the property this week. It is probable that Mr. David Gilmour, consulting mechanical engineer, and Mr. J. H. Crosby, the secretary, may also leave.

* * * *

African Farms, Ltd., and the Land.

The advantages accruing to the agricultural and stock industries of the Union by such intelligent and scientific methods of farming upon a large scale as that inaugurated, and carried out with success by the African Farms, Ltd., were pointed out with justifiable pride by Mr. Julius Jeppe, at the meeting of the Company on Tuesday last. "They had very materially assisted and benefited the country by the inauguration of first-class stud rams and ewes, and by the example set by those directly responsible for the carrying out of the project," he said, "and helped to raise enormously the quality of stock which has been distributed over the different provinces of the Union." Similar satisfactory terms were used to describe the farming operations of the Company, and the speech and report will well repay study.

* * * *

Alluvial Tin Fields of Africa, Ltd.

Details are now available of the Alluvial Tin Fields of Africa, Limited, formed with a capital of £100,000, to acquire the tin-bearing property of the Kuil's River Tin Mines, Ltd., which was registered in June, 1906, with a capital of £300,000. The new company offers for subscription 50,000 shares, which, it is represented, the vendors undertake to procure subscriptions for at par. Of the proceeds of such issue £30,000, together with 40,000 fully-paid shares, forms the consideration to be handed over for the properties acquired, leaving a gross amount of £20,000 for working capital and 10,000 shares in reserve. A natural question that arises is: Why go to the considerable expense of forming an entirely new concern instead of reorganising the old undertaking and supplying it with necessary working capital?

New Kleinfontein.

The new plant at the New Kleinfontein property is making rapid progress towards completion, and two of the four tube mills will be put into commission about the end of this month.

* * * *

The Rooiberg Mine.

The new Rooiberg plant which has been in process of construction for some time past is nearly erected, and it is expected that a start will be made with it at the end of next month. The air compressor is now running. It will be remembered that the Consulting Engineer stated in his last annual report that "the erection of the air compressing plant and installation of rock-drills should enable development to be energetically taken in hand during the latter part of the current financial year." Hitherto this work has been somewhat retarded by the scarcity of native labour.

* * * *

The E.R.P.M.

The new management at the E.R.P.M. is evidently not wasting any time in the effort to make things look somewhat better than they did for some months previously. The following tabulation will show how far it has succeeded:—

Yoar.	Tons Milled.	Revenue per Ton.	Cost per Ton.	Profit per Ton.
1910	2,126,334	27/3	15/6	11/9
1911	2,194,552	25/0	16/8	8/4
1912—January	164,550	28/3	21/1	8/2
February	144,200	33/0	22/8	10/6

The working cost was higher than ever in February, but in spite of this circumstance the profits rose as well, a rather unusual coincidence in Rand mining. The cause of this agreeable feature of the month's operations is easily seen to be due to the grade of ore milled, which is of a somewhat exceptional figure for the property in question. It indicates, in a word, the milling of ore of rather more than 8 dwts. in value, if one makes allowances for sorting and the rest. The payable ore reserves at 31st December last, according to Mr. H. Ross Skinner's estimate, averaged 6·9 dwts. over mining width, and from this consideration it may be inferred that the recovery of 33s. per ton milled will not be maintained longer than is necessary. The profit for January was £67,108, and for February £75,609, while it is rumoured that the profit to be declared for March will be in the neighbourhood of £95,000. This will be rapid work indeed, and is almost too good to be credited. It is interesting to refer in this connection to the remarks of Mr. A. Mackie Niven, who presided at the meeting of the Glencoe Collieries, Ltd., on the 22nd inst. Referring to the company's interest in the E.R.P.M., he said: "The latest information with regard to the company's affairs is to the effect that the sound mining policy now being followed is likely to result in such improved profits as will ensure quite a fair dividend for this year, and a better one for 1913. It is probably too much to expect that the former dividend of 40 per cent. per annum will be reached under anything like present conditions as to native labour and general working costs, but the investment should return us safely 30 per cent. per annum on the nominal value of the shares, which will be about 6 per cent. on the amount originally invested." There is a confident tone about the statement regarding a 30 per cent. dividend, which suggests that Mr. Mackie Niven was at pains to obtain satisfactory assurances himself on the subject before venturing to give them to the shareholders of the Glencoe Colliery. If so, the information is extremely interesting and gratifying.

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Our London Offices.

In another part of this issue will be found an illustration of Salisbury House, showing where the new offices of the *S.A. Mining Journal* are situated. It is noteworthy that over 90 per cent. of the South African company meetings take place in this building. Our offices are on the ground floor, and are easily accessible to South African and provincial visitors to London.

Excess Development.

The Executive of the Chamber of Mines have made representations to the Minister of Finance, with the object of bringing about a modification in the terms of the Mining Taxation Act of 1910, under the present provisions of which the cost of developing ore in excess of the annual requirements of the reduction plant is made a charge against working costs. It is hoped that these representations will receive sympathetic treatment. At the Chamber of Mines meeting last week Mr. Hamilton pointed out that it was very important that in mines where values were less regular than the ordinary, and where development ahead was not yet what it should be, the policy of keeping development well in advance was indisputably a desirable one within given limits, and should not therefore be discouraged.

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Rhodesia Output.

The February gold output of Rhodesia amounts to 49,864 ozs., valued at £200,744, compared with 59,976ozs., valued at £214,918 in January. Of the February total, Matabeleland contributed 26,961ozs.; Mashonaland, 22,903ozs. The output of other minerals was: Silver, 13,401ozs.; coal, 38,366 tons; lead, 46 tons; chrome ore, 3,136 tons.

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Index.

The Index to Vol. IX., Part II., of the *South African Mining Journal*, covering the period from September 9th, 1911, to March 2nd, 1912, will be issued with the next number of the paper, appearing on the 6th April.

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Pniel Diamond Mining Company.

A copy of the directors' report and financial statement of the Pniel Diamond Mining Company for the year ended October 31, 1911, has reached us. The report states that the revenue for the year amounted to £5,578 7s. 9d. The general expenses amounted to £6,296 16s. 9d.; a sum of £3,153 1s. 9d. was written off plant and buildings; shares in other companies were written down by £2,888 3s. 6d.; bad debts £143 3s.—a total of £12,481 5s. 1d., thus showing a loss on the year's working of £6,902 17s. 3d., and increasing the debit to profit and loss to £23,455 10s. In addition to the above expenditure, £2,581 19s. 5d. was spent on prospecting, two of the largest shareholders advancing the surplus spent over the company's revenue. The finds returned by diggers during the year totalled 5,648 carats, which realised £34,797 19s., or an average of £6 3s. 3d. per carat. At the end of the year 231 claims were held by 70 diggers. The capital of the company is £300,000 in £1 shares. At the meeting of shareholders held at Besters, on the Pniel Estate (present, Messrs. B. Aaron, chairman, A. A. Boss, S. Bebro, Alex. Aiken, A. Cohen, and J. S. Richardson secretary, altogether representing 151,195 shares), it was stated that the prospecting results were satisfactory, and that with the support of the shareholders in the provision of funds the temporary difficulties of the company would be overcome.

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Chartered Rumours.

A curious story was in circulation in London recently. It was said that the German Government had made a proposal to purchase 200,000 acres from the Chartered Company, at a price of between 6s. and 7s. per acre, in order to square off German territory in a certain district. There is another rumour to the effect that the British Government will take over the company, paying the shareholders £2 per share.

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Stores and Wages.

A schedule is appended to latest monthly returns of the G.M.E.'s department, showing the expenditure of the mines in salaries and wages to white employees during 1911. The total for the Union was £10,519,948. Of this sum, £9,270,748 was distributed in the Transvaal, £803,621 in the Cape Province, £299,397 in the Orange Free State, and

£146,182 in Natal. The distribution was £8,544,689 by gold mines, £36,668 by alluvial and reef diggers, and £13,737 by metallurgical and tailings works, the total for the gold mining industry being £8,595,094. Diamond mines paid out £1,233,793, collieries £356,904, base mineral mines £140,544, lime and flint works £19,171, and power supply companies £174,442. As will be seen by the tables printed elsewhere in this issue the total expenditure on stores for the year 1911 was £14,070,291, of which £12,460,281 was for the mines of the Transvaal, £820,338 for the Cape Province (the Government statement adheres to the term "Cape Colony"), £562,771 for the Orange Free State, and £226,901 for Natal. The industrial distribution was:—Gold mining industry, £11,714,755; diamond mines, £1,450,127; coal mines, £544,782; base mineral mines, £305,830; lime and flint works, £54,797.

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General Mining and Finance.

The accounts of the General Mining and Finance Corporation, Limited, for the year 1911 show a working net profit of £46,956, to which has been added £269,483 brought forward from the previous year, making a total unappropriated amount of £316,439, which has been dealt with by writing off £296,292 in respect of investments, etc.—a course rendered necessary by the abnormal depression prevailing during 1911—and carrying a balance of £20,147 forward to 1912. The valuation at which investments are taken in the balance sheet is lower than the market valuation at the close of the financial year. In these circumstances no dividend will be declared for last year.

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African Farms' Prospecting Results.

From the report and accounts of the African Farms, Ltd., printed elsewhere in this issue, it will be seen that the amount of cash on short loan, on loan against bond, and "sundry debtors," is £37,632 6s. 5d., less "sundry creditors" on current account £4,581 10s. 4d., and cash received on loan at call £20,468 2s. 7d., leaving a net credit balance of £12,582 at 31st Dec. The company has, with other participants, exercised its option to purchase the mineral rights over a divided portion of Riettontein No. 940 (adjoining Leeuwpoort), such portion being in extent 1,099 morgen, 81 sq. roods, and prospecting, with encouraging results, is in progress. Knoppieskraal No. 762 and Driefontein No. 696, Rustenburg, are also being prospected. On Welgevonden No. 1,172, Waterberg (Witwatersrand Land and Exploration Company, Limited), development has been steadily pushed forward during the year, and taking into consideration the variableness of tin lodes, results have been satisfactory. The directors regret that owing to the deplorable death, on 11th January last, of Mr. H. L. Smithers (the Company's mining expert), it is impossible to attach, as has been done in previous years, an engineering report on the other ventures belonging to the company.

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The Drill Steel Report.

It is some months since it was announced in the Press that Mr. Robert Allen's report upon the Drill Steel investigations made by him under the direction of the Mines' Trials Committee would be published at an early date. We expressed the contrary view, and in spite of the fact that so much time has elapsed, feel safe in saying once more that the publication of the report will be indefinitely postponed, and it is just possible that it will not be given to the public at all. The validity of many of Mr. Allen's chief conclusions depend upon the evidence of analyses made locally. These results have been, we understand, contradicted to some material extent by analyses of the same steel samples carried out in Sheffield. These again have been objected to by the chemists who made the first examinations, and a further series of analyses are therefore being made elsewhere in England with the object of throwing light upon the points in dispute. How it will fare if these again are repudiated we cannot say, but it is evident that until some reliable and generally accepted conclusions are come to the report aforesaid will be wanting in some very necessary information.

TOPICS OF THE WEEK.

THE PHTHISIS REPORT AND THE NEW BILL.

Although the full report of the Miners' Phthisis Commission has not yet reached us, there is no reason to suppose that the extracts printed elsewhere in this issue fail to give a correct *précis* of its main conclusions. Owing to the fact that the findings of the Commission on the extent and seriousness of the evil have already leaked out, the startling effect of the statistics now published has been discounted, though it is bad enough in all consciousness. It is just possible that the mode of reckoning employed by the Commission may lend itself to exaggeration. We are told, for instance, that for the purpose of arriving at a correct appreciation of the incidence of the disease the Commissioners selected a number of representative mines and sought as far as possible to examine medically the whole of the underground European miners on these properties. In all three thousand one hundred and twenty-six cases were subjected to special examination. Of the men dealt with in the first category nine hundred and ninety, or 32 per cent., were classed as suffering from miners' phthisis in one or other of its three stages. Applying this percentage to underground work generally on the mines of the Rand, the Commissioners suggest that of the eleven thousand four hundred underground European workers the total number affected cannot be far short of three thousand six hundred. In the absence of the detailed report of the Commission, one is slow to criticise—particularly in view of the high qualifications of its authors—but it would seem that in drawing its appalling conclusions the Commission ignored the obvious likelihood that those men who suspected themselves of disease would be the first to come forward for examination. Another conclusion more novel than convincing is that tuberculosis is more likely to be a consequence than a cause of fibrosis. On a question where doctors differ so radically, it is not for the layman to take sides, but it certain that this particular finding of the Commission will be questioned by other competent authorities.

Nor is it possible, in the face of all the testimony to the contrary, to accept the Commission's exculpation of the miner for contributory carelessness. On this point, after all, the evidence of practical men, mine managers, engineers, shift bosses, and the like—quoted repeatedly in our pages—should carry some weight, even against the opinion of the medical experts. The question at issue is one to be decided mainly by observation and experience underground, and the present Commission does not pretend to lay claim to much of either. Indeed, the recent Regulations Commission, which took a much more severe view of the miners' contributory negligence, appears to have given the question far deeper study. It is only fair to the medical men, however, to quote the wording of their own cautious, if questionable, opinion: "It has often been said," they remark, "that the carelessness of the miners themselves in neglecting the use of ordinary precautions is an important factor in the causation of miners' phthisis. There is no doubt that the miners as a body are prone to keep to traditional ways of work, and are slow in availing themselves of methods which cost time, and whose immediate advantage is not apparent. There is no doubt, also, that some are culpably careless; but the fact that the incidence of the disease falls heavily on all classes of underground workers, not excepting the supervisory class, is sufficient proof that the habits of the miners in this respect are not a critical factor in the prevalence of the disease." Nevertheless, we find it difficult to see how the careless habits of those who produce the dust in the first instance can fail to be a critical factor.

The recommendations of the Commission do not err on the side of faint-heartedness. They are both drastic and revolutionary, and raise a whole crop of questions in regard to their practicability. Their keynote is the same as that sounded by the Government Mining Engineer in the public discussion of the question recently—the miners must be saved from themselves. Heroic, indeed, is the only expression adequate to describe the doctors' proposals. They look neither to the industry on the one side—for which we cannot blame them—nor, on the other, to the effect on the livelihoods of the men who are to be banned as stricken with phthisis in one of its several stages. Indeed, we do not know if any of the glib commentators on the Report have fully realised what its recommendations mean to the men or to the mines. We doubt if the authors themselves realise it. They, at least, can shield themselves behind the perfectly just rejoinder that it was none of their business to attempt to do so. At any rate, they give that as a very good reason for not advising in regard to the question of insurance which, for all we can find in the Report, still remains a threefold obligation, involving alike the State, the men, and the mines. It is to be hoped that these remarks will not be interpreted in any unfriendly or unsympathetic spirit towards the sufferers. Too much emphasis cannot be laid on the great cardinal fact that phthisis can be eradicated—Mr. Kotze estimates that three or four years hard work will suffice to win the battle against it. Whether his new Compensation Bill, aiming to saddle the mines with an almost overwhelming burden of expenditure will hasten that much desired consummation is, however, extremely doubtful. At any rate the facts given in the report must be faced without affectation of pseudo humanitarianism. They demand the earliest and most earnest consideration of every mining man, for the measure of evil, its all-pervading effects, and the faint possibility of any cure make its prevention the first duty and chief anxiety of all concerned with the industry.

THE MINES, THE RAILWAYS, AND THE BUDGET.

Mr. Hull's Budget, amplified and rounded off by that of Mr. Sauer, presents all the old bad features of his former ones, and some that are new. In the former category may be noted the same reckless budgetting on the supposition that the present revenues of the Union are to be maintained indefinitely, and the same airy piling up of loan commitments. Among the latter developments of Mr. Hull's finance may be mentioned the extraordinary proposal whereby the funds of the Union are to make annual grants of £80,000 and £67,000 to Natal and the O.F.S. for ten years, as the price of their support of the Government. Against this the only virtues that can be claimed for the Budget are of a negative sort. It is conservative, because it lacks a single original feature; it makes a show of studying economy when, in reality, it is merely putting off the evil day of reckoning, by concealing its extravagance, and it promises reduction in railway rates, without any guarantee that such reduction will not be another disguised sop to the farmers, with no alleviation to the inland consumer. Meanwhile the public debt of the Union is to be increased by no less than £7,339,000 during the coming year, to be spent almost entirely on agriculture.

The chief of Mr. Hull's globular figures may be repeated. The revised revenue estimate for 1911-12 is £17,033,000, the revised expenditure £16,587,000, leaving an estimated surplus of £446,000, which Mr. Hull proposes to apply to the extinction of debt in terms of the Public Debt Commissions' Bill. For the new financial year, 1912-13, the estimated revenue is £16,112,000 and the estimated expenditure £16,782,000, leaving an estimated deficit of £670,000. This Mr. Hull proposes to meet by applying the surplus held over from the year 1910-11, amounting to £855,000, thus leaving a credit balance of £185,000 available to meet the requirements of the Supplementary Estimates for the year. The revised revenue estimate for 1911-12 of £17,033,000 includes, of course, the contribution of £1,159,000 from the Railway and Harbour Fund. The estimate of the revenue for the coming financial year shows a decrease on the anticipated revenue for the current year of £921,000. A very large portion of this decrease is explained by the fact that from the Railway and Harbour Fund during the coming year Mr. Hull will take only £500,000, as against £1,159,000 this year, thus leaving Mr. Sauer with more funds available for the reduction of railway rates. This fact explains £659,000 of the decreased estimate. The Customs revenue is expected on a conservative estimate to yield £95,000 less than the actual receipts for the current year, and mining taxation will, it is expected, show a shortfall of £53,000. On the other hand, there are anticipated increases of £34,000 and £29,000 in Post Office revenue and interest receipts respectively. The loan estimates may be summarised as follows: During the coming year loan expenditure is expected to amount to £7,339,000, representing an increase of £3,739,000 on the current year's estimates. The Union has to-day unexhausted borrowing powers of £6,640,000. It may be added that the Public Debt of the Union on March 31 last stood at £114,237,000, the year's interest liability being £3,877,000, which works out at 3·39 per cent. Against the debt we have a Sinking Fund which has accumulated to the amount of £5,055,000. The essential fact which emerges from his figures, and which the Minister did not attempt to conceal, is that but for the Railway contribution of £500,000 and the surplus of £855,000, which he is taking over from the balance of 1910-11, he would have a deficit to face of £1,170,000 on April 1, 1913. "The next Budget statement," said Mr. Hull, "will mean additional taxation." In touching on the Customs revenue, Mr. Hull held that caution is still advisable, and indulged in a review of the trade statistics for 1911. In pointing out that we were still importing largely articles which ought to be produced in South Africa, Mr. Hull said significantly: "I am not making out an argument for increased protection. Far from it. There are large and expanding markets within our borders which are waiting to be captured by our own producers." Mr. Hull quoted some interesting figures relating to the Mines of the Union. The State share of the gold profits, it may be remarked, represents 9·1 per cent. of the total dividends paid. Our total production of gold up to date has been £325,000,000; of diamonds, £106,000,000; coal, £23,500,000; copper, £9,000,000; and tin, £1,250,000. In the production of our minerals, 31,700 white men and 269,000 coloured men are employed. In bringing his speech to a close, Mr. Hull expressed the belief that the Government would be able to raise the whole or a large portion of the funds required for loan expenditure in South Africa, and hinted at encouraging the small investor through the Savings Bank.

Credit for the best feature in Mr. Hull's Budget—the reduction in railway rates—is to be shared with Mr. Sauer, though neither is doing more than attempting to observe the provisions of the Act of Union. The railway estimates are printed elsewhere in this issue, and it only remains to note that the Treasurer will forego £659,000 of his railway contributions to the Consolidated Revenue Fund this year. This will enable Mr. Sauer to reduce railway rates by nearly three-quarters of a million. But for the questionable action of the Treasury in demanding a sum of £400,000 from railways for interest and depreciation on capital that involves the former in no liability, the railways could make a further reduction in rates; and when the question of this claim comes up for debate it is to be hoped the representatives of the inland communities—who have to foot the bill—will stoutly resist it. Mr. Sauer's explanation regarding the mode in which the promised reductions will be allocated looks suspicious. He said: "I will not go fully into the question of in what respects the reduction will take place; but, shortly, I will say that what man wants most is food and shelter, and in that I will include coal and, foremost, agricultural produce. Those, shortly, are the directions in which the reductions will take place." Until we have some more definite announcement, it would be idle to comment on this statement. The speeches of Mr. Hull and Mr. Sauer, it will be seen, were equally remarkable for their omissions. The former contained no mention of alterations in the incidence of diamond mining taxation, gave no hint of what form the new taxation promised for next year would take, and was disappointingly meagre in its reference to the mining industry generally. And the latter, as we have seen, leaves us in doubt on the main question at issue. It may be that elucidation will be forthcoming in the course of the debate, now proceeding, on both budgets.

LATEST DEVELOPMENTS IN THE TIN INDUSTRY.

The Leeuwpoort Flotation—Welgevonden and Doornhoek—Graumann's "Claims."

After a long period of rumour and surmise on the part of the pubic, the flotation of Leeuwpoort by the African Farms, Ltd., and allied interests has at last been effected. So much has been expected from the event as a possible means of directing attention in a more than usually striking way to the prospects of the Rooiberg district in particular, and the Transvaal tin fields generally, that the immediate effect upon the market will doubtless be awaited with some eagerness by the holders of tin options. The recent advance in Rooibergs may have been an attempt to discount a possible improvement in prices in consequence of the Leeuwpoort announcement, or it may be merely an intelligent forecast of the trend of popular favour when the new Rooiberg milling and dressing plant is put into commission. So far, no movement of a specially favourable kind has developed itself, and the effects of the African Farms flotation in this direction, if any, have still to be looked for.

As we indicated last week, the capitalisation of the latest venture in the Rooiberg area has not been of anything like the dimensions anticipated, for some reason or another, by the man in the street. It is, nevertheless, upon a larger scale than the ordinary development company, and is, in fact, the largest tin mining undertaking, in point of nominal capital, in the country. As mentioned by Mr. Julius Jeppe at the meeting of the African Farms, Ltd., the distribution of the £1 shares is briefly:—

Vendors	£112,500
Cash Refund	50,000
Working Capital	112,500
	£275,000

The capital of the Rooiberg Minerals Development Co., Ltd., in the same neighbourhood is £210,00 authorised (£180,000 issued), and in addition there was a premium of £15,000 on the sale of 30,000 shares. The expenditure to the 30th June, 1911, on shafts, mine development, equipment, exploration, etc., but not including property, was almost £60,000, and the additional expenditure contemplated on account of the new plant and dam was £43,537, in all, say, about £100,000. A very large portion of this amount has been provided out of profits, and by comparison, therefore, the Leeuwpoort (African Farms) Tin Mines, Ltd., is starting operations upon a sounder basis than that upon which the Rooiberg company was floated. The funds provided should be ample to bring the venture to the productive stage it is considered, and, as will be seen from the report, there is already a large asset in the shape of ore at grass and ore developed, valued at about £235,611 gross recovery. A thirty-stamp mill and accompanying dressing plant is being designed. It will be observed that a considerable asset exists in the shape of alluvial tin upon the property. The details regarding assay values go to confirm an opinion expressed in this journal some time ago, to the effect that the grade of the Leeuwpoort ore was not as high as that of the Rooiberg mine. For instance, the reserves of the latter mine as at June 30th, 1911, were given at 21,650 milling tons with a recovery value of 4.5 per cent. The average value of the Leeuwpoort ore at the end of November, 1911, some 67,325 short tons, is quoted by the manager, Mr. J. Irvine Jameson, as being 2.27 per cent. This is sufficiently satisfactory, of course, provided that development opens up an adequate tonnage, and upon this point the information to hand appears to be favourable.

Swaziland Tins.

It is gratifying to learn that an ample water supply has been provided for, in normal seasons, by the completion of the construction work necessary, and that two hydraulic elevators are already at work with a third on order for delivery at the end of this month. The electric light installation which is to be erected will add to the capacity of the undertaking inasmuch as work will be possible by night as well as day upon the two principal working areas.

The improved methods of working suggested by Mr. F. Douglas Osborne during his recent visit, promise to result in considerable economies. An expansion of operations is contemplated, and the recovery of 35 tons monthly of concentrates carrying 70 per cent. tin will, at the price of £180 per ton, as pointed out, yield the handsome profit of £2,000 odd for that period. For the financial year ended on the 30th June last the company produced 319 tons of concentrates with a working profit of £14,168, or, say, £45 per ton; on the basis of the estimate given by Mr. H. D. Day, the engineer referred to in the circular, the profit per ton works out at over £50 per ton, an appreciable gain. The improved position anticipated will mainly be the outcome of the enlarged scale of hydraulicing rendered possible by the better water supply, and within a few months' time the methods of the Swaziland Tin, Ltd., should be a valuable object lesson to those who are interested in sluicing work generally. The field for work of this kind in the Transvaal is probably much wider than is commonly supposed, and the success of hydraulicing ventures is correspondingly of advantage to the country apart from the earnings of the individual undertakings concerned.

The Zaaiplaats District.

The results of the borings upon the Government lease portions of Zaaiplaats are not yet made known, but, as usual, rumours are current, and are to the effect that gratifying discoveries have been made. Reports from Mr. Warren, who is opening up Graumann's claims near the north-western boundary of Zaaiplaats, continue in a pleasing strain, the latest giving the information that in one shaft tin shows up continuously, sometimes in greater and sometimes in smaller quantities. The workings are in the pegmatite horizon, only a few hundred yards east of the T.C.L. lease adits, in the neighbourhood of which the boreholes above-mentioned are located.

Doornhoek and Welgevonden.

Little news comes from Doornhoek, which, situated as it is many miles from any populous centre, is not easily accessible to the searcher after news. Some weeks ago, however the probable closing down of the property was spoken of as an event of the near future. There is no definite confirmation of this report, and no decision with regard to it at the moment, as far as we are aware. The remarks of Mr. Julius Jeppe at the meeting of the African Farms the other day suggest that production is not sufficiently profitable to warrant the continuance of active operations, and that the lease of the plant to the Welgevonden mine is a subject of discussion. The discoveries at the latter property tend to put rather a different aspect upon the value of the neighbourhood as a tin field than one would be inclined to surmise from the past history of Doornhoek. Even with regard to the South African Tins property, however, there seems no reason to be despondent, for the difficulties of the venture appear to have arisen more from limited funds than from any serious geological disadvantages. It is considered to be a two to three per cent. proposition, and Leeuwpoort is not claimed to be more than this, according to the manager's report. The difference lies in the matter of development, and development is a costly business. If the money difficulties of Doornhoek could be satisfactorily overcome, the property would be afforded the opportunity of showing its merits that it has never yet had.

The Vredehoek Tin Deposits.

In a recent contribution to the transactions of the Geological Society of South Africa, Mr. E. H. Nellmapius, M.E., B.Sc., gave a brief geological description of the tin deposits on the lower slopes of the Devil's Peak, Capetown. The formation consists chiefly of slates and hard fine-grained quartzites, generally much disturbed and broken, and often lying almost vertical; the same bed, due to inclinal folding, outcropping a number of times over a comparatively short distance. The formation is that of the Malmesbury slates, with their intrusive granite, although the latter is not to be seen in the immediate neighbourhood of the Vredehoek deposits, and there are none of the usually well marked characteristics of granite-slate contacts. Trenching, sinking and cross-cutting have shown that there exists in the slates and quartzites a mineralised zone or stock-work of tin-bearing quartz, in the form of veinlets and stringers. The most numerous and chief tin-bearing veinlets in the mineralised zone are horizontal, or have a very low dip, and are roughly parallel to one another. In one place about twenty of these quartz veins, from two inches to six inches thick, have been exposed in a section seventy feet in depth. There is also a lesser series of narrow vertical veins cutting across the more or less flat system,but not tin-bearing as so far exposed. The tin-bearing veinlets consist of large interlocking white quartz grains, with cassiterite generally in large well-formed crystals near the selvages, or as large crystalline grains. The mineral is very pure, and the usual accessory minerals are mostly absent. It would appear that the deposit is somewhat similar in general character, although Mr. Nellmapius does not remark upon the circumstance, to the Tygerberg deposits, of which so much was heard some time ago.

Century Tins.

Although no special publication of results has been made by the Century Tins, who are mining in fissured felsite-granite contact country on the boundary line between Uitkyk No. 2241 and Rhenosterhoekspruit No. 1608, some distance to the north-east of the Rooiberg properties, the developments are said to be satisfactory. Some attention is being drawn to the neighbourhood by the forthcoming proclamation of the two farms referred to on the 9th April next. The ground is a long way from Warmbaths Station, and practically inaccessible to the ordinary prospector, so that unless individuals or syndicates with sufficient means are attracted to the scene on pegging day, the company on the spot are likely to have everything their own way.

THE COAL STRIKE AND ITS LOCAL EFFECT.

Influence on Middelburg—Witbank Collieries—Export Trade Largely Increased.

Commerce and Industry have been developed to such a pitch of international inter-dependence that the effects of any really important branch of Industry are to-day almost worldwide. The coal strike in Great Britain, which is being attended with such terrible distress, has seldom if ever been exceeded in point of disorganisation of trade and upheaval of social conditions throughout the British Isles. Mills, mines, foundries, etc., appear to be ceasing work all over the United Kingdom, and it is not unlikely that the closing down of numerous large engineering works and the disorganisation of shipping will have a certain effect on this country which purchases the whole, or virtually the whole, of its machinery from Oversea manufacturers.

Increased Export via Delagoa Bay.

Whilst such an effect may not be felt for some considerable time, and will only then be experienced in a more or less indirect way, the Transvaal is already feeling the influence of the derangement of the Coal Industry in a direct and beneficial manner. The old saying, "It's an ill wind that blows nobody good" finds a very good example in the case of the coal strike in Great Britain, and its influence on the collieries of the Middelburg-Witbank area. Under normal conditions the amount of coal sent to Delagoa Bay is about 500 tons per day, but at the present time about 2,000 tons are being daily dispatched. With the existing wharfage and loading facilities this is the utmost that can be done, but at any rate the fact that four times as much Transvaal coal is being exported from Lourenco-Marques as in normal times reflects in some degree the influence of the strike in this country. The greater part of this produce goes to Colombo, Bombay, Aden, and the Red Sea Ports. The Transvaal Coal Owners' Association has for some time past been developing a coal trade with these places, but since the outbreak of the strike in the English coal fields there has been a marked appreciation in the amount of coal required from the Transvaal. Orders have also been booked for April for Rio de Janeiro, the River Plate and Portuguese West Africa, and it may be said that the Transvaal Coal Owners' Association have orders booked up for April, and for a part, at any rate, of May.

Orders Refused.

On account of the inability of the Association to do more than this, orders have had to be refused. However, the appreciation must be very gratifying to the coal companies since the increased bunker trade at the Portuguese port means in addition to the larger quantities of coal sent seawards, an increased consumption by the railways, which carry the augmented quantities of coal to the coast. The influence of the strike is likely to be felt by the Transvaal coal mines for some considerable time. Were indeed the strike in Great Britain to cease to-morrow—and there appears no reason for anticipating such an event—it is estimated that the effect on South African collieries would be noticeable for another two months at least. Indeed, in the case of such a gigantic derangement of industry as is the coal strike in England, none can foretell what may eventuate or for how long the disorganisation of trade may last. Transvaal coal mines are at any rate it seems assured of larger sales for a month or two, and although the increased demand for fuel has not so far resulted in more than a slight appreciation in selling price, it is clear that the turnover of the coal mines has improved in value substantially during the past week or two.

The Need for Fostering.

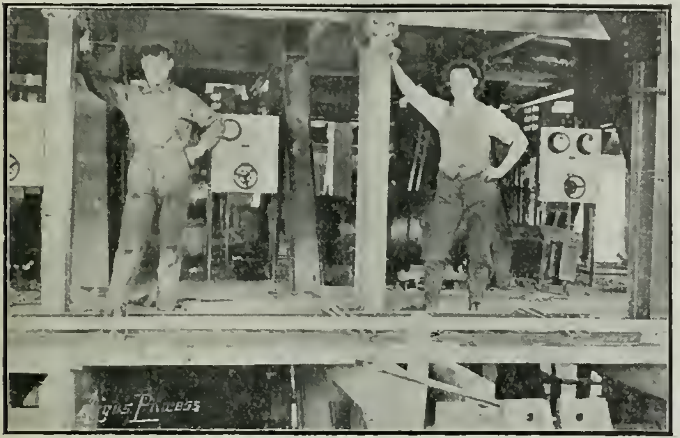
Of course, as Mr. Dalrymple described it at the Anglo-French Navigation Coal Estates meeting held a few days ago, the present position of the coal industry is a "passing phase." The chairman, speaking on the question of taking advantage of the present coal strike in England, referred to the shortage of native labour and the necessity for the Railways and Harbours Board of the Union giving special encouragement to the export and bunkering trade by granting a considerable reduction in the coal rates coastwards. Mr. Dale Lace, at the Cassel Coal Company meeting, put in a similar plea for more sympathetic treatment at the hands of the Union Government, but Mr. Lace's was much more forceful and emphatic. In the course of his speech he stated that the railway charges on coal freighted from the Witbank area to Delagoa Bay amount to 50 per cent. of the price of coal delivered at the port. "It is not humanly possible to establish an export trade in face of such a handicap," he declared. Certainly the coal industry of the Transvaal has a great chance at present of improving its productive status, and the present should be an opportune time for introducing means which will foster and assist an export trade. Even though the coal strike in England may be but a passing phase, there are undeniably large Oversea markets to be developed in more normal times. As to the extent of the Witbank-Middelburg coal fields, it is hardly necessary to state that they are sufficiently immense to serve a far larger market than at present obtains for many years to come.

The Tanganyika Concessions, Limited, has issued the following statement:—"There is no truth in the rumours that this company intends to reconstruct, or to issue further capital."

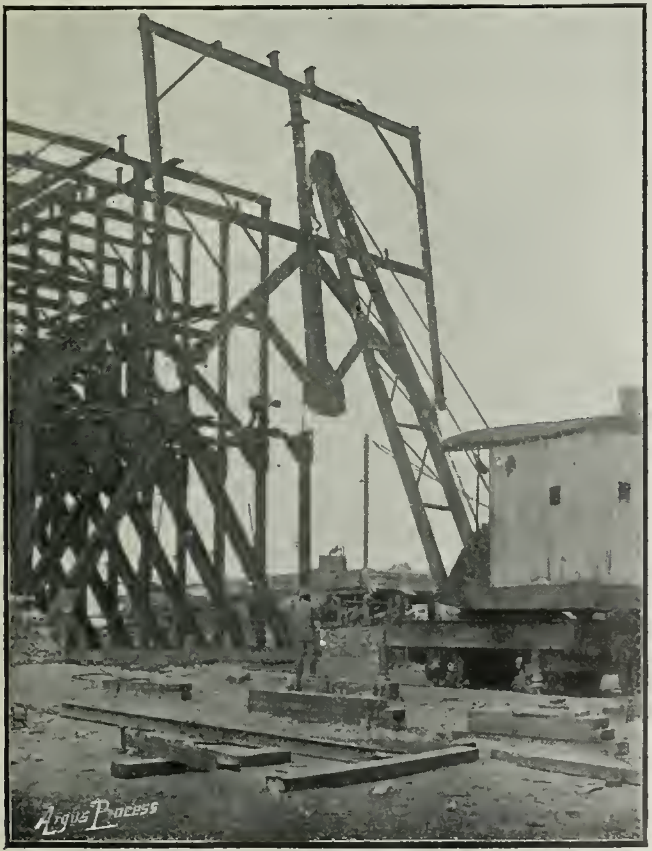
NEW CROWN MINES MILL.

Some Interesting Photographs Showing Construction Work—The Rand's Latest Reduction Plant.

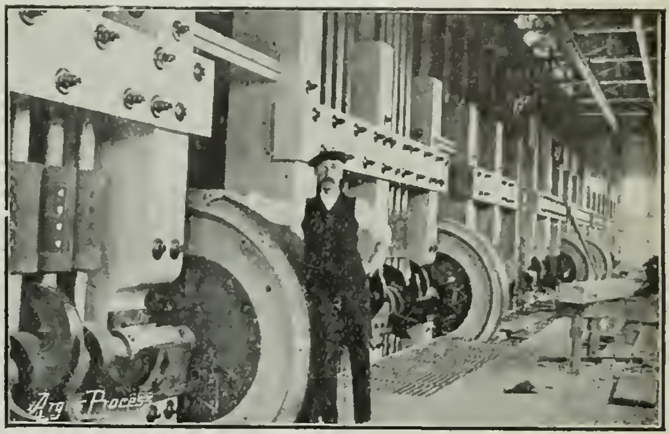
The accompanying photographs illustrate various aspects of the new mill at the Crown Mines during the progress of construction. In our last issue a picture was shown of the erection of the first section of the steel framing of the ore bins. The railway track leading to the top floor of the mill was also included in the photograph. This week there is represented another view of the progress of construction of the ore bin framing, the last section being just hoisted into place. In another picture there appears the completed structure, and a good idea may thus be formed of the design commonly adopted nowadays in Rand mills. The Cam shaft floor is an interesting subject, and still more so are the switch boards of the separate 10-stamp motor units located as usual beneath the bin floors. The steel trestle way was found extremely useful in the assembling of the various steel portions of the housing of the mill, and it will be observed also that it is admirably adapted to take the weight of the 45-ton trucks in which the ore is conveyed to the mill from the crusher station. We are indebted for the photographs to Mr. H. A. Buckland, resident engineer of the Ferreira Deep, who was in charge of the construction work at the Crown Mines mill.



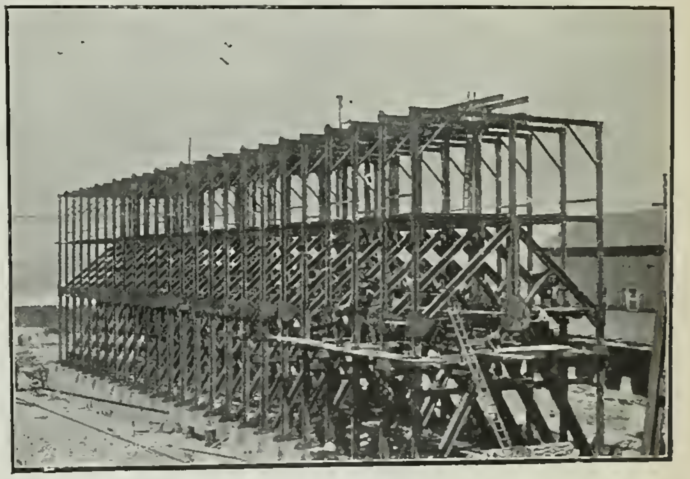
Switches for 10-Stamp Motor Drive, Crown Mines New Mill.



Hoisting Final Section Bin Framing.



Cam Shaft Floor, Crown Mines New Mill.



Mill Bin Steel Framing.

Steel Trestle Way to Mill.

OUR OFFICES.

Exploration Buildings, Commissioner Street, Johannesburg,
Wherein are situated the Head Offices of the
S.A. Mining Journal.

Mozambique Co.

It is stated that the Marquis de Frondeville, a director of the Banque de l'Union Parisienne, has joined the Paris Committee of the Mozambique Company. This is a distinct acquisition for the company, and indicates a belief that its progress, which in the past two years has increased by leaps and bounds, will continue. The representation of such powerful financial interests will be particularly welcome to the French shareholders.

Luipaardsvlei Estate.

The directors of the Luipaardsvlei Estate and Gold Mining Company report that 49,980 tons of ore were crushed during the three months ended December 31, 1911. The total yield was 10,668·427 ozs., equal to 4·269 dwts. per ton milled. Ore reserves as at December 31 totalled 440,704 tons. The revenue from ore milled was £44,637, equal to 17s. 10·346d. per ton milled; profit on accumulations amounted to £3,518, making the total revenue from gold £48,155. Ordinary working expenditure amounted to £42,356, equal to 16s. 11·389d. per ton milled. Extraordinary expenditure totalled £430, or 2·067d. per ton milled. Profit on working was £1,851, or 8·89d. per ton milled. Profit on accumulations was £3,518 (as above stated), equal to 1s. 4·894d. per ton milled; making the total profit on working £5,369. Sundry revenue amounted to £2,665, raising net profit to £8,035. The average monthly profit for the six months ended December 31 was 2,980. Capital expenditure was £1,340, after allowing for development redeemed.

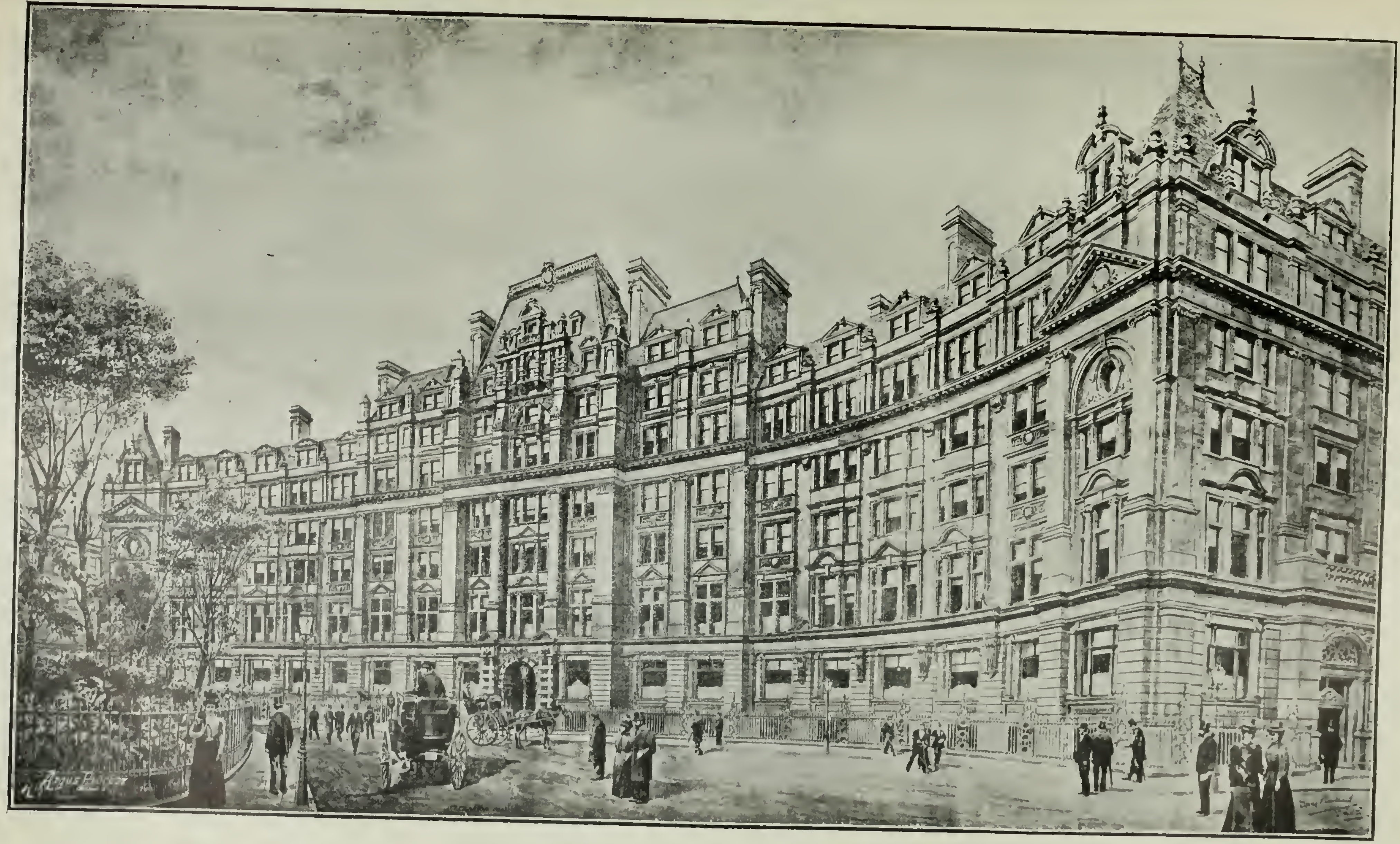
Barrett's Rietfontein Syndicate.

The report of the directors for 1911 states that no change has taken place in the property, which consists of portion of the farm Rietfontein No. 9, in extent 878 morgen 132 square roods, together with homestead thereon. A portion of the syndicate's farm is still let under lease at £300 per annum. The expenditure for the year ended 31st December, 1911, was £476 2s. 4d., made up as follows:—Interest, £421 19s. 11d.; secretarial, £32 10s.; sundries, 21 12s. 5d. The revenue, derived solely from rents amounted to £300. The balance to the debit of profit and loss account is £11,643 5s. 11d.

Transvaal Coal Trust.

The directors of the Transvaal Coal Trust report a satisfactory year's trading. The improvement upon the results of the previous twelve months amounted to £3,216 3s. 1d., the total profit having been £51,034 5s. 7d., less a sum of £1,611 13s. 7d., in respect of Government profits tax. The output from the collieries, which amounted to 497,369 tons, has continued to be dealt with through the Transvaal Coal Owners' Association (1910), Limited. During the year the provisions of the Mining Taxation Act of 1910 came into force. Under the old base metal tax the amount paid to the Government for the year 1910 was £639 1s. 3d.; while the assessment for 1911 on the profits tax basis amounted to £1,611 13s. 7d. In addition to its coal interest, the company holds 253,500 shares in the Brakpan Mines, Ltd., and 250,000 shares in the Springs Mines, Ltd.

OUR OFFICES.



Salisbury House, Finsbury Circus, Front,

Wherein are situated the London Office of the *S.A. Mining Journal*. The building also contains the offices of the Transvaal Chamber of Mines, the Anglo-French Exploration Co., the Premier D.M. Co., and the Allis Chalmers Co.

PROGRESS OF THE WITWATERSRAND CO-OPERATIVE SMELTING WORKS.

A Brief Description—A Useful Adjunct of the Industry.

Co-operation has been the watchword of progress in Witwatersrand mining for years past, and it is perhaps a little remarkable that not until April of 1910 was co-operation introduced into smelting practice. Apart from such smelting refining and retorting work as is necessary in the ordinary routine of gold production, there are numerous bye-products such as slags and black sands, the treatment of which are rather outside the province of the ordinary metallurgical department of a Rand mine. Some of the largest propositions, it is true, have the necessary smelting equipment for dealing with these bye-products, but the majority of properties are not prepared for operations of this nature; indeed, the greater proportion of Main Reef companies could hardly treat such bye-products at a profit. Previous to the establishment of the Witwatersrand co-operative smelting works at the Robinson, the most common means of disposing of slags, pots, etc., was to sell them to scattered metallurgical works, which dealt in products of this nature.

Witwatersrand Co-operative Smelting Works.

All the Mines Customers.

Smelting operations commenced at the Witwatersrand co-operative works nearly two years ago, and now-a-days practically all the bye-products, etc., produced by the Witwatersrand mines are smelted at this establishment. One might say that all the mines of the Witwatersrand are now shareholders in this useful concern since, we understandstand, that the Jumpers, the West Rand Central, and the New Spes Bona are the only producing companies which are not members of the co-operative smelting works. The three concerns cited above are now comparatively unimportant concerns, and they too, it is interesting to note, although not members of the co-operative smelting works, send their bye-products, etc., to be treated there.

Types of Material Treated.

The works are situated on the site of the old Robinson chlorination works, and within a stone's throw of the Robinson company's mill. The works are well equipped for dealing with all classes of auriferous material other than the ordinary mill pulp sand and slime of a Rand mine. The chief sources of yield are pots, slags, liners, bricks, and black sands. Of course the material sent for treatment varies considerably in different months, according to the output of such bye-products, etc., by the metallurgical department of the mines. In one month as much as 300 tons has been dealt with by the Robinson works, but the next month a very much smaller amount of stuff may be received and dealt with. Fruitful sources of recovery are the pots used in the cyanide smelts. This class of material may yield from two to twenty or thirty ounces per ton depending on the means of original treatment. These pots are dumped through a hopper in the roof of the works into the furnace, into which litharge is fed. The plumbago of the crucibles acts as a reducing agent, and the resultant buttons of lead containing the gold and silver are cupelled in a muffle.

Some Items of the Plant.

Amongst the more important items of the smelting equipment are a Fraser and Chalmers water jacketed blast furnace, a batea pan, and a 6ft. tube mill for the regrinding of the heavy black sands. These sands are transferred from the pan to a collecting tank, and are then treated in Pachuca vats. The gold is precipitated by means of the Merrill zinc dust and filter press process. The coke used at the works, it may be remarked, is obtained principally from Natal. The Witwatersrand Co-operative Smelting Works is doing useful service for the industry, and there can be no doubt that the establishment of this smelting equipment has done a good deal to improve the recovery of gold from the mines. The accompanying photo gives one a general idea of the lay-out of the works.

Rosetta G.M. Co.

The Rosetta Company reports a further rich strike of ore.

Manicaland Mineral Output.

The mineral output of the Territory of the Companhia de Mozambique (Manicaland) for the month of February, 1912, was as follows:—Reef: Mill—Gold won (fine gold), 205 ozs., 10 dwts., 5 grs.; tons crushed, 944; value £863 1s. 3d. Cyanide—Gold recovered (fine gold), 27 ozs., 3 dwts., 19 grs.; tons treated, 480; value £114 3s. 9d.

Mines of the Witwatersrand.

XIV.—THE ROBINSON G.M. CO., LTD.

A Wonderful Record—Over Nine Millions Distributed in Dividends—Main Reef Development and its Influence on the Life of the Mine.

If the test of a mine's greatness be the value of its output and the amount of money it distributes amongst its shareholders, the Robinson G.M. Co. is assuredly one of the greatest of mines, even in these days of big amalgamations and vast reduction plants.

History of the Company in Figures.

The Robinson commenced crushing in January, 1888—more than 24 years ago. Between that date and up to the end of last year, six and a half million tons had been mined, and over five and a third million tons had been milled. The total gold declared amounted to 3,814,771 ozs., or 14.145 dwts. per ton, the total working revenue being £16,039,831, or 59s. 6d. per ton. Of this, working expenditure absorbed £5,415,164, or an average of 20s. 1d. per ton, leaving a profit of £10,624,668, or 39s. 5d. per ton. The dividends declared to date amount to over nine millions sterling. These figures are stupendous. The whole history of the Robinson is in fact a gilded tale of almost unexampled prosperity. In the first year of crushing only 10 stamps were at work, and all of the 7,486 tons mined were put through the mill. These yielded no less than £91,098, or £12 3s. 4d. per ton. The working expenditure in those days would give the modern Rand mine manager a most distressing nightmare. It was no less than 57s. 10d., but even with costs at nearly £3 the Robinson declared a working profit of £9 5s. 6d. per ton, or £69,438 in the aggregate. In the next year—1889—from 10 to 40 stamps were employed, and 31,472 tons were crushed for a yield of over a quarter of a million and a profit of £192,766. By 1890 the yield per ton had dropped to a little over £5; in the next year the rate of recovery was 92s. 3d., and the year after not much more than an ounce. But in 1893 over £5 per ton was again recovered, and by that date working costs had dropped to 35s. 7d. It is noteworthy that not until 1897 was any waste rock sorted out. Previous to that year all the ore mined was sent to the battery. For a few months preceding the outbreak of the Boer war the Robinson was recovering 75s. 10d. per ton, and the profit earned for the January 1st to October 11th period of 1899 was £438,200. During and since the war the Robinson has operated from 56 stamps in 1901 to 250 stamps and 6 tube mills during last year. After the resumption of crushing, large and increasing profits were piled up and in 1908 the company attained probably to the zenith of its fame and achievement, by declaring over one million pounds sterling in profit. In that year working expenses were at the rate of 12s. 7d. per ton, and the Robinson's expenditure was held up to the Rand as a moral and example of what working expenditure should be. Latterly the fetish of working costs has been relegated somewhat to the shelf of false policy. The working costs for last year came to 14s. 7.5d. as compared with 12s. 2.4d. in the preceding year. The amount of ore milled in 1910 was 638,900 tons, and in last year 592,700 tons . This reduced tonnage brought down the profit from £936,756 to £911,308, despite an advance of 4s. per ton in the grade

Robinson Gold Mining Co.—The Battery.

The Life Factor.

Such, in brief, is the statistical history of this company. In a recent issue we gave particulars of last year's wosk as reflected in the consulting engineer's and manager's reports. Recently a change in the management of this mine has taken place, Mr. Palmer Carter, who has for the past nine years managed the Ferreira, taking over the reins of office from Mr. Paul Selby, who has gone to the Geldenhuis Deep. Mr. Carter has entered upon the management of the Robinson in what may be described as its declining years. Never-the less there is a "lot of life" remaining in this old property. It may be recalled that at the meeting held in March, 1908, the Chairman stated that "As far as we are able to judge the mill tonnage remaining in the mine on the stoping widths at present assumed, after allowing for sorting, is about equal to the tonnage already milled (3,711,134 tons), yet shareholders must be prepared to amortize the investment in about 7½ years at the working costs of to-day. We can also contemplate the working of a considerable portion of the Main Reef which stands practically untouched in your property, and which may be expected to yield some profit after the richer areas have been extracted." The Robinson is in an advanced state of development, and comparatively little little expenditure will have to be contracted under this head in the future, especially in regard to Main Reef blocks. The experience gained at the Robinson seems to point to an average extraction per claim of between 50,000 and 60,000 tons for the two richer reefs—Main Reef Leader and South Reef. How long the quantity of rich ore will last depends largely, of course, on the extent of its admixture with the low grade Main Reef body. Last year 33 per cent. of the ore stoped came from Main Reef blocks, 27 per cent. from the Leader, and 40 per cent. South Reef. Thus one-third was from what may be described as the lower grade zone, and two-thirds from the richer areas.

Robinson Gold Mining Co.—The West Incline Shaft.

Main Reef Development

The payable ore reserves on Leader and South Reef at the end of 1911 were estimated at 1,526,661 tons, whilst it was estimated that there were some 1,307,133 tons in the mine of payable and available Main Reef. A highly important statement on a matter which must have a marked influence on the life of the mine was made by Mr. Paul Selby in his report for last year. Mr. Selby remarked: "I feel that the subject of ore reserves cannot be passed without calling attention to the large discrepancy of 895,304 tons between the payable Main Reef tonnage as shown last year and that available at present. Of this difference, 148,593 tons are accounted for by the fact that more Main Reef was mined than developed during the year, thus leaving a difference of 746,711 tons, the bulk of which can be accounted for under the following headings:—Blocks which were considered payable last year but which have proved to be unpayable as stoping progressed; loss due to caving, and ore transferred from the payable to unpayable reserves, due to the higher pay limit consequent upon higher working costs. In considering the Main Reef reserves, it must be borne in mind that further losses of this reef, due to caving, are likely to occur." It is thus evident that one is not justified in anticipating that the Robinson will terminate its life in pursuance of a low grade policy for such a lengthy period as might have been estimated at the end of the preceding year. In fact the extent of Main Reef available seems to be a somewhat problematical factor. Taking last year's development returns we find that of the 90,668 Main Reef tons developed, 44,048, or nearly one-half, was unpayable. An examination of the latest reports does not therefore make one particularly hopeful as to the part which the Main Reef is to play in the last few acts of what has been a drama of almost unparalleled magnificence in mining. But at the same time it must not be supposed that the Robinson is as yet on its "last legs." Indeed, the mine is assured of a prominent place in the output for some time to come, and if the Main Reef proves disappointing it is just as likely that other sections of the property will rise to the occasion, like the majority of Witwatersrand mines have done, and will substantially exceed the expectations of to-day.

De Beers Deferred: Dividend and Bonus.

It is notified that the Board of Directors of De Beers Consolidated Mines, Limited, have declared a final dividend of 10s. and a bonus of 2s. 6d. per share for the financial year ending June 30, 1912, on deferred shares registered in the books of the company as at March 31, 1912, which will be paid as soon as practicable after the receipt of the transfer returns from the London Transfer Office, to March 31, 1912, say, early in May. The Board also notify that they have resolved to revert, commencing after the end of the current financial year, to the declaration of dividends on deferred shares in December and June, instead of September and March, as at present, but in order to cause shareholders as little inconvenience as possible in consequence of this change, they will declare a dividend in respect of the quarter ending September 30, and another in December, 1912, and thereafter declare half-yearly dividends.

The Transvaal Silver Mines, which were liquidated at the end of 1909, are being re-opened, and are now said to have reached the producing stage. The property is situated on the farm Dwarsfontein, Pretoria district, has an area of 3,458 morgen, and the issued capital of the old company was £146,000. Argentiferous galena and zinc are now being won. The latter is exported, while the former is disposed of locally.

New Heidelberg Roodepoort.

The report of the directors for 1911 states that no alteration has taken place in the property, which consists of 316.21 claims on the farm Roodepoort No. 165, in the district of Heidelberg, six bewaarplaatsen, and two machine stands. The original lease for the tributing of the property was cancelled by mutual consent, and a new lease entered into with John Stephen and Simon Beaton on similar terms. Crushing operations were recommenced at the end of August last, and since that date the mill has run steadily. The expenses for the year amounted to £327 6s. 11d., and the amount received from the tributors by way of royalty on gold won was £221 8s. 7d. This revenue, of course, was only in respect of four months' work; and the debit balance to profit and loss account was increased by £105 18s. 4d.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted for the consideration of the Editor that is not accepted by him will be returned if a stamped and directed envelope is enclosed for the purpose.

THE GEOLOGICAL SURVEY AND RAND GEOLOGY.

The Defects of the "Simple" Explanation—Rietfontein the Crux of the Problem—Further Enlightenment Desirable.

It is rather to be regretted that Dr. Mellor's paper on "The Normal Section of the Lower Witwatersrand System on the Central Rand" is no longer open for discussion at the meetings of the Geological Society. Somewhat late in the day, but "better late than never," to quote an old adage, some interesting and fairly abundant criticism has appeared, and it is possible that the time necessary for the examination in the field of Dr. Mellor's statements may have delayed the discussion somewhat. It is also possible, of course, that the main objections to his view have been already brought forward, in which case a prolonged debate upon more or less insignificant details would scarcely serve any useful purpose. The criticism of chief importance is that of Mr. Baring Horwood, and although we are not prepared to go as far as Mr. Olver, who said at the last meeting of the Society that the former "seems ready to subscribe to the majority of Mr. Bleloch's dogmas," it is sufficiently obvious that he is in agreement as far as the geology of the Rietfontein series is concerned. The continuity of the Rietfontein series along the lower Witwatersrand is not a theory of to-day. It is, as we pointed out three weeks ago, "a prospector's question" rather than a favourite belief with professional geologists, and with the exception of Mr. Horwood, no one in the latter category has appeared to maintain the proposition in the face of Dr. Mellor's arguments. There is nothing left then except to fall back upon the geological evidence led in favour of the prospectors' view, and examine how far it may be considered sound or otherwise. The liability to confuse the identity of the Coronation shale and the contorted bed is quoted as the key to the whole problem, and there is no doubt that if one could show that Dr. Mellor's contorted bed—and, we may add, the contorted bed of Drs. Hatch and Corstorphine—beyond Jeppes were really the Coronation shale, it would simplify a very great deal that now appears intricate and abnormal. It would, in a word, simplify the problem of the Rietfontein series. It would not, however, largely obviate every difficulty connected with the geology of the Lower Witwatersrand System, and might possibly substitute quite a new bunch of puzzles. The great number of quartzites between Mr. Horwood's Coronation shale which lies in an unusual development of other shales just south of Rietfontein is not satisfactorily explained by the assertion that the quartzites referred to belong to the Government Reef and Jeppestown series. This involves us in the old argument of special local development, and at once the effort after simplicity begins to appear surrounded with embarrassing details. The position is still more difficult when it is remembered that the whole section from near the Rietfontein mine to the Main Reef series is supposed, on the simplified basis, to be an uncompleted portion of the Government and Jeppestown series, for on this basis the quartzites, supposed by the Geological Survey to be Orange Grove quartzites, are Coronation quartzites, and therefore a long way above the base of the Government series. There is a resemblance between this group of beds and that which fans out westwards from Maraisburg which requires some elucidation before the simpler view is as clear as it should be.

Granite or Something Else.

The mapping of a mass of granite between the Rietfontein beds and the disputed Orange Grove quartzite just mentioned is objected to by Mr. Horwood, who remarks that "there is no surface evidence to warrant this being done." It is not necessary to rely upon surface evidence wholly, and we learn that several boreholes were put down in granite at various points over the area in question some time ago, and, further, that a cross-cut was driven for a distance of 500 feet or so into the alleged granite mass from the underground workings of the mine. There is said, moreover, to be a good deal of granite upon a dump at the east end of the Rietfontein property, and the assumption is that it came from an adjoining shaft. If these statements are correct the problem should easily be solved by microscopic investigation, if the examination of a hand sample were insufficient to lead to a decision. Mr. Horwood is doubtless cognisant of the borehole operations and the cross-cut work mentioned, and in view of the skill of both Dr. Mellor and himself in microscopic investigation it is strange that there should be any difference of opinion with regard to this so-called granite body. The statement with regard to the cross-cut leads us to infer that the rock in question is what is commonly known as the Rietfontein dyke. Another point upon which Mr. Horwood asks for enlightenment is the "faulted complicated area at the western end of the Rietfontein Mines, represented by the kopje immediately to the south of the No. 1 shaft," and says that he "would like to know to what beds the Survey believes the quartzites of this kopje belong. Also no reference has been made to certain boulder beds, resembling beds belonging to the Ventersdorp series, which also occur on this kopje and appear to rest unconformably on the quartzites." The rocks referred to are marked distinctly enough in the map attached to Dr. Mellor's recent paper as Orange Grove quartzites, and they may be seen so indicated in the accompanying map which we reproduce for the sake of reference, and which, as was explained before, is practically a fac-simile of that of Dr. Mellor. We believe that the boulders referred to are supposed by the latter to be crush fragments of the same rocks.

Parallelism at Rietfontein.

A rather strong argument in favour of the conformity of the Rietfontein series is the alleged parallelism between the contours of the 8th level in the Rietfontein Mine and some quartzites of the Lower Witwatersrand System as outlined by the Geological Survey. This same supposed parallelism is shown still more strikingly in a diagram which appears in Mr. Bleloch's treatise on "The New Geology." In the case of the latter the rather abrupt bend of the Rietfontein beds to the south-west is unfortunately ignored, and an absence of any reference to this matter in Mr. Horwood's criticism tends to weaken the validity of evidence which would otherwise fit in very well with the "simplified" view of Rand geology. The criticism, as far as it relates to the vicinity of Rietfontein, would, as Dr. Mellor has suggested, be much assisted by the presentation of a section explanatory of the undoubtedly confusing structure of the various groups of strata. He has himself proposed a solution in the series of diagrams to scale which appear in Fig. 2 of his recent paper, and it would be interesting to compare it with an alternative one. The same diagrams, by the way, explain the query which Mr. Horwood puts in the following words, after referring to the comparatively low dip of the strata along the northern edge of the Witwatersrand, and the vertical and occasionally overtilted dip of the strata just to the south of them:—"It is a little difficult to conceive how in the same area the lower portion of a conformable series can form the limb of an anticline while the upper portion, along the same section, form one of the limbs of a syncline. If Dr. Mellor would illustrate this by drawing a diagrammatic section it would tend to make his meaning much clearer." It is not explained how the diagrams referred to are deficient in this respect.

A Convenient Map.

In view of the importance of the subject it is much to be desired that, even if discussion on the particular paper in question be terminated, the consideration of the whole problem should be continued by means of independent contributions. Probably no one will dispute the accuracy of the mapping of the Survey, as far as the outcrops of various groups of strata are concerned, whatever be the opinions with regard to the faulting theory, and the facilities afforded by this mapping as a groundwork upon which to base other readings should be an encouragement to those who have had an opportunity of making investigations in the field. Since the above notes were written, we have received a copy of Dr. Mellor's reply to Mr. Horwood. A portion is reprinted in this issue, and the map mentioned above has been attached to it for convenience in reference.

Messina February Operations.

The mill ran a total of 8.8 days, and treated 553 tons of ore obtained from development work. Concentrates produced 88.58 tons assay value 50 per cent. copper. Middling produced 45 tons, assay value 12 per cent. copper. Development footage 521 feet. North lode—3rd level : No. 5 E. winze, depth 24 feet, lode dipped south out of winze. East drive near No. 7 winze, a short cross-cut south has exposed lode, assaying 12.6 per cent. copper over 60 inches. Winze No. 1 B. Bonanza west end, depth 30 feet, lode exposed assaying 16.5 per cent. copper over 48 inches. Middle lode—3rd level : No. 3 W. winze, depth 87 feet, assays 37.9 per cent. copper over 12 inches at 80 feet, and 13.8 per cent. copper over 12 inches at 85 feet. North lode—4th level : Winze No. 1 W. hanging wall, depth of 15 feet, assays 38·3 per cent. copper over 60 inches. Winze No. 2 W. hanging wall, from 90 feet to 102 feet, assays 20 per cent. copper over 60 inches. Winze No. 1 W. foot wall, depth 23 feet, assays 36.8 per cent. copper at 15 feet, and 20.8 per cent. copper at 20 feet, over 60 inches. Winze No. 2 W foot wall, depth 35 feet. From 20 feet to 35 feet, average assay 28.8 per cent over 60 inches. Values disclosed by winzes from 4th to 5th levels are highly satisfactory. North lode—5th level : At junction of No. 2 W. winze with level cross-cut north through Bonanza lode, average assay 18.5 per cent. copper, for 21 feet of ore. Drive started on hanging wall of lode, assays 16.9 per cent. copper over 60 inches for 15 feet. North lode—6th level : Raise No. 3 W. for 35 feet, assays 6.2 per cent. copper over 60 inches. Raise No. 2 W. for 15 feet, assays 6.6 per cent. copper over 60 inches. Cross-cut north has exposed foot wall of lode, passing through granite "horse," and exposed ore body 20 feet wide, average assay 20.7 per cent. copper. The mineral is chiefly bornite. Work on 8th level has been suspended, owing to insufficient supply of native labour. General : Reidler compressor was started at beginning of February, and is now supplying air for 6 drills. Erection of new 250 h.p. boiler is practically completed, and flues and chimney are in hand. Electric shaft signals are now in use at main shaft. Boring by diamond drill is still in progress at coal area, and the seam already opened is being worked.

Lydenburg Estates.

An extraordinary general meeting of Lydenburg Estates, Limited, was held in London recently, under the presidency of Mr. John Hay, when the following resolution, passed at a meeting of the company held on February 6, was confirmed :—"That the capital of the company be reduced from £215,000, divided into 215,000 shares of £1 each, to £53,750, divided into 215,000 shares of 5s. each, and that such reduction be effected by cancelling capital which has been lost or is unrepresented by available assets to the extent of 15s. per share upon each of the 192,000 shares which have been issued, and are now outstanding, and by reducing the nominal amount of all the shares in the company's capital from £1 to 5s. per share."

Pomona Diamond Dispute Settled.

Reuter's correspondent at Luderitzbucht, writing on the 21st of March, states that a definite agreement, ratifying the settlement of the Pomona dispute, has been signed at Berlin. All law cases which are still pending in this connection have now been withdrawn. The German Colonial Office has officially notified that the long-promised Imperial decree which is to regulate the legal situation in regard to the Pomona fields will now be issued. It is still uncertain when the working of the fields is to be commenced, as further negotiations as to the wording of the decree, flotation of the company and the question as to who shall work the fields have still to be concluded. The Koloniale Bergbau Gesellschaft and the Deutsch Diamant Gesellschaft are both anxious to procure a lease, while other interested persons propose that the company shall work the fields.

THE ZAMBESIA MINERAL AREAS.

A "Small Man's" Country—Facts for Prospectors—The Gold and Copper Formations—What Alluvial Workers may Make—The Costs and the Capital Necessary.

The following information has been supplied to the "Mozambique Gazette" from semi-official sources, and should prove of the utmost interest and value to anyone intending to try his fortune as a miner in a comparatively small way in the Zambezia mineral area (Tete district), which is rich in possibilities:—"The whole territory (Tete) is amply mineralised. The copper belt stretches for a distance of 70 miles, from Tete to Caroabassa, along the banks of the Zambesi. Assays have ranged from 2 to 60 per cent. Syndicates are developing along the belt, and at a place called Kakanga 60 tons have been mined assaying 25 per cent. copper. As to the reefs in this country they are in accord with the usual geological characteristics of the formations in which their occur. A great number of discoveries have been made, and, though many of the old workings have already been located, it is certain that there are many others which have not yet been discovered, such as the silver mines of Chicoa, so greatly talked about at the beginning of the 16th century and whose fame induced the Portuguese Government to despatch several expeditions for their re-discovery and exploitation.

The Gold Occurrences.

As for gold, that has been found along the copper belt, assaying in some places 4 ozs. per ton. At Chifumbase gold mining operations have been carried on with good results, 772 ozs. having been the output from January to July, 1908, from a five-stamp battery, giving the value of £3 15s. per oz. At Missale gold has also been extracted, and, if properly worked up, this region together with that of Chifumbase, should be the future gold district. At Muendi testing operations were made by hand crushing and amalgamating the quartzite. From 20 tons a bar of about 29 ozs. gold was obtained. Assays on decomposed quartzite were obtained, which showed 14 dwts., 34 dwts. and 2 ozs. gold per ton.

Alluvial Gold—Dredging.

Alluvial gold is found in several localities in the district of Tete, not only in the beds of rivers, but in places where to-day no signs of ancient rivers can be discovered. Rivers which could easily be worked by dredgers are the Ruio, the Domfe, the Luia, the Mazoe, and a portion of the Revugwe. No exact account can as yet be given respecting the exploitation of any of the above mentioned rivers, but what can be stated is that for centuries natives have worked them and taken out gold by very primitive means, such as by mere surface washing of sands, very seldom reaching the bed rock, and also by picking out the gold from the interstices of the rocks on the banks. There is also the Vubue River, which probably would not do for dredging, but could be fairly worked by sluicing, or by some other means of the sort. The Mazoe River is being worked with good results, the output for two months being 144 ozs. As yet no dredging operations have been carred out in the Tete district.

The Coal Beds.

As regards the coal beds, the outcrops can be seen at many points along the course of the Zambesi River, from Chinde to Zumbo, that is, from its mouth to the Rhodesian border. Development has been carried out at different places, the coal won resembling that of the Transvaal.

Alluvial Work—Capital Required.

On the subject of the capital required by the prospector the information furnished us is to the effect that with £100 a man can in the Tete district see himself through the first few months, and so enable him to get on his feet. If sober and economical, he may live on £8 a month. A man can always make a living by working alluvial on this field, as it would not be difficult for him to wash out from £15 to £20 worth of gold per month—of course, with luck, a great deal more.

Seasons and Climate.

There are two well defined seasons—the rainy season, from the end of November to March; and the dry season, during the rest of the year. As a rule, the climate in Tete district is healthy, but very warm in the vicinity of the Zambesi River. At a distance, say, about 45 miles, from that river, towards the north, the country begins gradually to rise, until we reach Chifumbase at 2,300 feet, and the Angonia plateau, at 4,000 feet elevation. As a rule, sickness in the country is due more to the non-observance of the more elementary rules of colonial hygiene than to the climate. At Angonia the climate is considered as good as at Johannesburg. Malaria is unknown there, and the few cases observed are considered to have been due to inoculation of the virus brought from somewhere else.

Labour Cheap and Plentiful.

As regards native labour, that is both cheap and plentiful. Native labourers can be obtained from 5s. to 10s. per month. As a rule, food is supplied, and the cost of this averages, according to market fluctuations, from 2s. to 4s. per month per head.

Prospecting Supplies.

Mining material is admitted into the territory free of duty. The Zambezia Company has large stores in the town of Tete, a general merchant's store, and a mining material store, where there is a good supply of everything required by the prospector, including camp equipment, etc. This material is sold, with a very small commission added, at the London price, plus freight from London to Chinde, and from Chinde to Tete. Mining material can be brought from Chinde to Tete by the Zambezia Company's sternwheelers at £3 per ton.

Travelling Facilities.

The usual mode of travelling in the country is by "Macheela" (a shaded hammock slung on poles and borne by natives), but donkeys, horses and mules can be used with advantage. The port for Tete is Chinde, on the coast, from which the Zambezia Company's own steamers run up the Zambesi to Tete in eight days. Navigation proper stops from September to January. But "house-boats" are used during these months. A first-class passage, by this Company's boats, from Chinde to Tete costs £12. But second class and deck passages, with or without food, can be arranged. The steamers are fitted with all the latest improvements for the comfort and convenience of Europeans travelling in the tropics. Other companies also run steamers on the river. To carry a "Macheela" twelve natives are usually employed. Carriers can always be arranged for through the Zambezia Company to carry travellers and their baggage to parts of the territory at a distance from Tete.

Further Aids.

All the staff in the office of the Mining Directors at Tete speak several languages, and a British assayer, who is in charge of the laboratory, which is fitted up with all the latest and most up-to-date apparatus, will make any description of assays at low charges.

The Routes Thither.

The shortest route to the goldfields from the South is by Matoko (Kaiser Wilhelm district, Mashonaland) or by steamer from Lourenco Marques to Chinde, and thence up the Zambesi, as described.

Luenha and Mazoe Closed.

Since the forgoing was written, the basins of the Luenha and Mazoe Rivers have been closed to alluvial prospecting as from December 23rd last.

THE WAGES BILL OF THE MINING INDUSTRY.

Mines in the Union Distribute Ten and a Half Millions in White Wages in 1911.

The following table of expenditure on salaries and wages of white employees on mines in the Union (for the year 1911) is taken from the annual report of the G.M.E. for 1911:—

Province and Classification.	Gold Mining Industry.					Diamond Mines.	Coal Mines.	Base Mineral Mines.	Lime and Flint Works.	Power Supply Companies (per se).	Totals.
	Mines.		Reef and Alluvial Diggers.	Metallurgical Works and Tailings Works.	Total.						
	Witwatersrand.	Outside Witwatersrand.									
TRANSVAAL—	£	£	£	£	£	£	£	£	£	£	£
Technical Staff* ..	764,153	88,514		4,588	875,255	22,593	46,060	26,554	3,171	20,226	975,859
Clerical Staff	382,167	21,572		1,607	405,346	30,589	20,231	7,024	1,637	15,243	480,070
Other White Employees	7,080,179	205,929	26,525	7,542	7,320,175	166,969	109,776	65,749	13,177	138,973	7,814,819
Totals	8,226,499	316,015	26,525	13,737	8,582,776	220,151	176,067	99,327	17,985	174,442	9,270,748
CAPE—											
Technical Staff* ..	—					60,995	2,969	11,176		—	75,140
Clerical Staff	—			—		45,872	1,518	4,900	No record	—	52,290
Other White Employees	—		1,830		1,830	643,099	6,889	24,373		—	676,191
Total .. ..£	—		1,830	—	1,830	749,966	11,376	40,449	—	—	803,621
ORANGE FREE STATE—											
Technical Staff ..	—					30,600	8,281	—		—	38,881
Clerical Staff	—			—		17,801	2,994	—		—	20,795
Other White Employees	—		5,120		5,120	215,275	18,704	—	622	—	239,721
Totals .. ..£	—		5,120	—	5,120	263,676	29,979	—	622	—	299,397
NATAL—											
Technical Staff* ..	685				685	—	28,905	120		—	29,710
Clerical Staff	240		3,193	—	240	—	14,710	—		—	14,950
Other White Employees	1,250				4,443	—	95,867	648	564	—	101,522
Totals .. ..£	2,175		3,193	—	5,368	—	139,482	768	564	—	146,182
UNION OF S. AFRICA											
Technical Staff* ..	853,352			4,588	857,940	114,188	86,215	37,850	3,171	20,226	1,119,590
Clerical Staff	403,979			1,607	405,586	94,262	39,453	11,924	1,637	15,243	568,105
Other White Employees	7,287,358		36,668	7,542	7,331,568	1,025,343	231,236	90,770	14,363	138,973	8,832,253
Totals .. ..£	8,544,689		36,668	7,542	8,595,094	1,233,793	356,904	140,544	19,171	174,442	10,519,948

* Includes £52,259 paid in salaries to medical officers.

THE YEAR WITH BRAKPAN MINES.

Financial Position—First Results of Crushing—The Ore Reserves.

The reduction works at the Brakpan Mines were started up towards the end of May; and at the end of the year 241,204 tons had been treated yielding a working profit of £110,976 19s. 7d., equal to 9s. 2.422d. per ton crushed. The initial difficulties incidental to the starting up of the plant, together with insufficiency of native labour, were the main causes of the full development programme having to be considerably curtailed meanwhile. The directors, as a consequence, considered it advisable to accumulate a fund for the purpose of increasing the development footage as soon as circumstances should permit; and with this end in view it was decided to debit working costs with a fixed sum of 1s. 6d. per ton crushed as a provision towards the consequent extra expenditure to be incurred later on. At the end of the year this fund was in credit to the extent of £6,641 3s. 3d., a sum sufficient to cover about 2,500 feet of work on the present cost basis. The development footage accomplished during the year amounted to 10,675 feet, of which 9,701 feet were in reef formation with an average assay value of 10.07 dwts. over an average width of reef of 32.89 inches. During the early stages of reduction operations it was not possible to calculate with exactitude the actual tonnage being crushed per month, the factors usually adopted for the calculation of such figures being adversely affected by the delay in bringing the full number of tube mills into commission. It is impossible to supply figures as to the exact bearing of this under-estimation upon the working costs and grade per ton crushed; but the amount under-estimated was not serious, and the matter was rectified as soon as proper running conditions as regards the mill and other portions of the reduction plant had been reached. The ore reserves were re-calculated at the end of the year, and on December 31st last, the estimated payable reserves amounted to 1,925,346 mine tons of an average value of 6.73 dwts., as against the estimate of 2,035,108 mine tons valued at 6.62 dwts., at May 31, 1911. This reduced tonnage is due to the elimination of certain low grade areas which, in view of the work done and information gained since the inception of milling, are now classed as unpayable. At the same time the present ore reserves, although calculated and valued on a most conservative basis, show a slightly higher grade than that recorded prior to the commencement of crushing, whilst the estimated stoping width now averages 58 inches as against the former figure of 52½ inches.

Capital Expenditure.

After providing for the interest due on the loan, £100,000 has been placed to a reserve account for capital expenditure; £7,869 13s. has been appropriated for Government profits tax; and the balance of £370 1s. has been carried to the balance-sheet. It was estimated that the cash resources of the company upon the completion of the equipment programme would be exceeded by an approximate amount of £150,000, which sum, however, included the cost of certain shareholdings incidental to the company's business, stores on hand, etc., which could be considered as cash assets. The actual position at the end of the year was a shortfall of £54,964 0s. 8d., after appropriating £100,000 of the profit earned to December 31, as already set forth. The assets of the company against this liability (as referred to in the directors' circular) amounted to £66,852 13s. 10d., or a surplus over liabilities (after the appropriation of the £100,000) of £11,888 13s. 2d. The original estimate in respect of the equipment of the mine amounted to £1,135,700, whilst the cash provided by the issue of shares, interest received and sundry revenue totalled £1,078,734 17s. 8d., or a shortfall of £56,965 2s. 4d. At the end of the year the sum expended against the estimates amounted to £1,155,557 7s. 1d.; outstanding engineering orders then already placed came to £19,726; and the further amount allocated to complete equipment was £10,000—total, £1,185,283 7s. 1d.; or an original under-estimation of requirements by £49,583 7s. 1d. The sum required to fully equip the mine exceeded the cash provided from all sources by £106,548 9s. 5d. All future ordinary capital expenditure, in excess of the £29,726 provided for as above under the head of original equipment, will be met out of revenue, and will be provided for by means of a reserve fund to be created for the purpose.

THE YEAR WITH THE RAND MINES, LTD.

Alterations in Investments—Important New Holdings—Details of Advances to Subsidiaries.

At the commencement of the year 1911 the capital of Rand Mines, Ltd., was £490,000 in 1,960,000 shares of the nominal value of 5s. each, of which 93,335 shares of 5s. each were held in reserve. In June last, the capital was increased to £550,000 by the creation of 240,000 new shares of the nominal value of 5s. each. This increase was authorised by the shareholders at a special general meeting on the 19th June, 1911. During the year 259,330 reserve and new shares of 5s. each were issued as fully paid up in payment for various share interests, particulars of which are given hereafter. At the close of the year the issued capital of the company was £531,498 15s. in 2,125,995 shares of 5s. each, leaving in reserve 74,005 shares of the nominal value of 5s. each. The profits for the year were £1,117,408 10s. 10d. Compared with the previous year the profit shows a reduction of £16,139 8s. 3d. This decrease is accounted for by a decrease in profits on investments sold of £8,346 18s. 11d., and a decrease of £7,792 9s. 4d. in ordinary profits, including dividends on shareholdings. The cash and cash assets at the commencement of the year, after deducting all liabilities, were £1,006,397 19s. 7d.; add profits for the year, £1,117,408 10s. 10d.; total, £2,123,806 10s. 5d. This sum was dealt with as follows:—Expended on investments, £271,866 8s. 8d.; dividends Nos. 16 and 17—220 per cent., £1,169,297 5s.; balance, cash and cash assets on hand after deducting all liabilities, £682,642 16s. 9d.; total, £2,123,806 10s. 5d. In addition to the assets taken over from Messrs. Wernher, Beit, and Co., other purchases of shares and debentures for cash were made during the year, of which the following are the chief items, viz.:—9,700 £1 shares in Nourse Mines, Ltd.; 7,559 10s. shares in Crown Mines, Ltd.; 900 £1 shares in Durban Roodepoort Deep, Ltd.; 12,000 £1 6 per cent. Cumulative Preference shares in the Victoria Falls and Transvaal Power Co., Ltd.; 82,125 £1 shares in General Estates, Ltd., 5,000 £4 shares in New Modderfontein G.M. Co., Ltd.; 5,758 £1 shares in Pretoria Portland Cement Co., Ltd.; £33,960 5 per cent. Debentures of the East Rand Proprietary Mines, Ltd. The following shares were sold:—150 £1 shares in the Ferreira Deep, Ltd.; 55,100 £1 shares in the Wolhuter Gold Mines, Ltd. The following debentures were redeemed:—£9,800 5 per cent. debentures of the Village Main Reef G.M. Co., Ltd. The quantity of water supplied to various mining companies and other consumers during the year was 827,659,000 gallons. This was 151,459,000 gallons more than last year, and is the greatest quantity ever supplied from your reservoirs. The net profit for the year was £25,434 2s. 6d., which is £7,049 19s. 6d. more than last year. The close of the year was marked by a decrease in the usual rainfall and the calls upon the company for water were very heavy. It was, however, possible to meet these calls, and the value of the reservoirs as a stand-by to the mines has been amply demonstrated. The water stored in the reservoirs at 31st December, 1911, was as follows:—Natal Spruit Reservoir, 685,088,000 gallons; Booysens Spruit Reservoir, 198,176,000 gallons; total, 883,264,000 gallons. The rainfall for the season, July to June, 1910-1911, was 34.04 inches, as against 35.29 inches during the season July to June, 1909-10. The directors' report adds: The feature of the past year has been the large increase in your company's interests, not only in companies in which it previously held shares, but also in other important companies on the eastern and western sections of the Witwatersrand, and the acquisition of holdings in the valuable unfloated mining area lying to the south of the Robinson Deep Gold Mining Co., Ltd. The supply of native labour still fails to meet the demand of the gold mining industry, and consequently most of the companies in which you are interested have not been able to show the results which a more plentiful supply of native labour would have insured. Advances have been made by your company jointly with the Central Mining and Investment Corporation, Ltd., to the Crown Mines, Ltd. The amount owing to this company by the Crown Mines, Ltd., at the close of the year was £166,672 14s. 6d. Advances have also been made to the Durban Roodepoort Deep, Ltd., and to the Co-operative Exchange Yard, Ltd. In order that shareholders may have an opportunity of perusing the reports and accounts before the annual meeting, it has been decided that meetings which which hitherto have been held in the month of March, shall, in future, be held at a later date. The forthcoming meeting, having been convened prior to this decision, must be held on the date for which it was convened, viz., Wednesday, 27th March, but as shareholders have already been advised, no business will be transacted thereat, and the adjournment of the meeting to Wednesday, the 5th June next, will be moved. At the end of 1910 it was anticipated that in the course of a few months, practically the whole of the electric power and compressed air required by the various companies in which your company is interested would be supplied. Unforeseen difficulties arose, however, and although most of the companies have been in readiness to receive electrical power in substitution for steam power, the Rand Mines Power Supply Company, Ltd., has not been able to meet the calls upon its resources. The steam plants of the various companies had, however, been kept for stand-by purposes, so that it was possible to tide over the difficulty. A large power station is now in course of erection at Vereeniging, on the Vaal River, from which power will be transmitted to the Witwatersrand area by the Rand Mines Power Supply Co., Ltd. It is expected that further power will be available from this station about August, and that before the close of the year the full requirements of the mining companies will be met. During the year two dividends, Nos. 16 and 17, of 110 per cent. each, have been declared, absorbing £1,169,297 5s.

SOME INDUSTRIAL STATISTICS FOR FEBRUARY.

Coal and Base Metal Output—Explosives Consumed—Decrease in Prospecting and Base Metal Claims Held.

MINES AT WORK.

The Government returns for February put the number of gold mines at work as 101, of which one was in Natal, 62 were on the Rand, and the remainder in outside districts of the Transvaal. In addition, there were three mines in the Transvaal which were described as "milling, but not declaring gold." Reef diggers numbered 20, and alluvial diggers 13, three being located in the Cape Province. Metallurgical works numbered three, and tailings works five. Development for the month totalled 46,061 feet of main drive and cross-cuts, 3,505 feet of main shaft sinking, and 23,245 feet of other development. The average number of rock-drills in use was 4,761, a drop of 30 on the number for January; and the tonnage hoisted was 2,464,784 tons. These figures are for the Transvaal only.

COAL PRODUCTION.

The coal sold by the collieries of the Union totalled 605,034 tons, value at pit's mouth £153,895. The average price realised in the Transvaal was 4s. 7·36d. per ton, which is the best figure for several months past. In January the average was 4s. 5·54d. Cape collieries sold 5,632 tons at an average of 11s. 6·20d. per ton; Orange Free State collieries disposed of 39,980 tons at an average of 5s. 6·21d. per ton, and Natal sold 224,260 at an average of 5s. 6·68d. In tabular form the details are as under, the number of collieries at work being shown in parentheses:—

	Tons sold.	Value.	Per ton. s.	d.
Springs-Brakpan (5)	52,240	£14,719	5	7·62
Middelburg (14) ...	245,424	55,126	4	5·91
Other areas (9) ...	37,498	7,467	3	11·79
Transvaal (28) ...	335,162	77,312	4	7·36
Cape (8)	5,632	3,243	11	6·20
O.F. State (5) ...	39,980	11,029	5	6·21
Natal (20)	224,260	62,311	5	6·68
Union (61) ...	605,034	£153,895		

OTHER MINERALS.

The production of copper and tin for the past three months compares as under:—

Copper.

	Dec.	Jan.	Feb.
Transvaal	——	4,453	3,435
Cape	64,665	——	116,519
Total	64,665	4,453	119,954

Tin.

	Dec.	Jan.	Feb.
Transvaal	18,549	26,682	23,003
Cape	277	——	——
Total	18,826	26,682	23,003

The production of other minerals for February was a under:—

Asbestos.

Cape	81·924	1,265
Natal	3·000	60
Total	84·924	1,325

Graphite.

Transvaal	3·355	75

Magnesite.

Transvaal	33·000	75

Lead.

Transvaal	44·000	299

Lime.

	Dec.	Jan.	Feb.
Transvaal		6,371	10,739
Cape (no record)		——	——
O.F.S.		280	630
Natal		78	136
Total		6,729	11,505

Flint.

	Dec.	Jan.	Feb.
Transvaal		133	945

Silver.

	Ozs.	
Transvaal (bullion)	75,718	£8,297
Transvaal (other minerals) ...	238	24
Natal (bullion)	3	—*
Total	75,959	£8,321

* Not specified.

EXPLOSIVES.

The manufacture of explosives for the month totalled 66,455 cases, of which 20,141 were made in the Transvaal, 27,491 in the Cape, and 18,823 in Natal. The Cape exported 476 cases besides those used within the Province.

PERMITS AND CLAIMS.

At February 29, in the Transvaal, 894 prospecting permits were in issue, as compared with 925 at December 31 and 748 at June 30, 1911; 87,636 prospecting claims were returned as at February 29, as against 89,587 as at December 31, and 101,410 as at June 30, 1911. Diggers' claims totalled 10,162 as at February 29, as against 10,005 as at December 31, and 9,345 as at June 30; and base-metal claims totalled 60,122 as at February 29, as against 65,644 at December 31, and 70,477 as at June 30.

Swaziland Tin.

The following details are published by the board for the information of shareholders:—The construction work necessary to improve and increase the water supply is now practically completed, and an ample water supply, in normal seasons, will in future be available. Two hydraulic elevators are already at work, and a third on order will be despatched to the mine at the end of the month. Orders have been placed for two complete electric lighting plants, which will permit of work on two of the principal tin areas being carried on night and day. Mr. H. D. Day, an engineer thoroughly conversant with hydraulicing for tin, has spent the past two months on the property. He has initiated the improved methods of working suggested by Mr. R. Douglas Osborne, to which reference was made at the last annual meeting. It is expected that considerable economies will now be effected in respect of labour. Extensive boring operations to test the extent of the deposits have been carried out, and Mr. Day reports that he anticipates that in about a month from now there should be no difficulty in recovering at the rate of about 35 tons monthly of concentrates of 70 per cent. tin. Such an output, taking tin at £180 per ton, should yield a profit of a little over £2,000 per month.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' Examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings, Box 2061, Johannesburg.

THE POSITION OF THE KNIGHT CENTRAL.

Improved Grade—Higher Costs Owing to Lower Efficiency and Expense of Labour—The Ore Reserves.

At the Knight Central in 1911 315,171 tons of ore were milled for a profit of £70,817, as compared with 302,228 tons during 1910, for a profit of £79,011. The grade showed an improvement of about 6d. per ton, but working costs were about 1s. 3d. per ton higher than for the previous year, due entirely to the increase in the wages and recruiting expenses of the native labour. In addition the efficiency of the native labour was lower. The payable ore reserves on 31st December, 1911, amounted to 644,300 tons with an average assay value of 6 dwts. over 60.6 inches stoping width, the average value per ton being practically the same as that of the previous year, but the total tonnage shows a decrease of 55,700 tons. This decrease was chiefly due to the shortage of native labour. It is hoped that during the next few months the labour force will be strengthened, and enable the management not only to increase the tonnage milled, but to push on development work. The appropriation account may be summarised in the following manner:—Balance brought forward from 31st December, 1910, £72,208 15s. 2d.; audit fees for year 1910, £210; profits tax for year 1910, £5,011 10s.; total, £66,987 5s. 2d.; profits earned during 1911, £70,817 6s. 6d.; freight rebate on gold, interest and sundry revenue, £2,166 9s. 7d.; total, £139,971 1s. 3d.; income tax paid in London, £94 11s. 7d.; capital expenditure during the year, £32,411 19s. 8d.; amounts written off in connection with an accident to a hoisting engine and for prospecting work, £2,020 9s. 3d.; total, £34,527 0s. 6d.; leaving a balance of £105,444 0s. 9d. The directors decided not to declare a dividend for the past year, as they considered it advisable to maintain the company's financial position with the view to materially increasing the ore reserves. It is apparent that the percentage of payable ore developed for the footage driven still continues low, and until there is a material improvement in this respect, the directors consider it essential to maintain a considerable cash balance.

Consulting Engineer's Report.

The Consulting Engineer, Mr. S. C. Thomson, writes:—Although the tonnage milled during the past year was 13,000 tons more than the previous year, this increase is not reflected in increased profit, even with the slight improvement in the yield per ton from 22s. 9.4d. to 23s. 3d. In this instance, as in many others, the difficulty has been not only the inadequate supply of native labour, but also the increase in recruiting expenses and wages, the inevitable result of competition in obtaining labour where apparently the supply is not equal to the demand. This condition has also the usual result of decreased efficiency. By referring to Mr. Roberts' report, you will see that the extraction obtained has been satisfactory, viz., 95.6 per cent., but that the average costs for the year have increased from 17s. 6.6d. last year to 18s. 9d.; and he also states that the native efficiency has dropped from 13 tons per month per boy employed to 11.25 tons. As far as the mine itself is concerned, the development has suffered through similar conditions; but, at the same time, I cannot see that there has been any falling off in the percentage of payable ore or in the average value of the payable percentage. The area of your holding is a large one, and, given sufficient labour at reasonable cost, I see no reason why the position should not improve, even assuming that there would be no alteration for the better in the average grade of ore.

Manager's Report.

The Manager, Mr. F. G. A. Roberts, writes:—Shafts and stations—West shaft—This shaft has been sunk 623½ feet on the incline to a total depth of 3,812½ feet, or to within 131 feet of the 13th level, and timbered 610 feet to 3,725 feet. The station for the 10th level at 3,339 feet has been completed and equipped with a waste rock box. The workings on the 11th, 12th and 13th levels from the east shaft have passed the line of this shaft and are being connected as the shaft goes down. The 8-in. air column has been extended 939 feet from the 5th to the 10th level. East shaft—This has been sunk 34½ feet and timbered 25 feet to 4,130 feet and 4,063 feet respectively. The large winze from 494 feet east on the 14th level has been sunk 263½ feet to a total depth of 338 feet. A small station has been cut and driven on the 15th level commenced at 300 feet. The temporary pumping station on the 14th level has been equipped with a third 4½-in. x 8-in. three-throw pump, and a fourth is being installed. Development—Exclusive of shaft sinking, the footage done during the year amounts to 10,179 feet. Of this total 8,311½ feet or 81.65% was done on undisturbed reef, 87 feet or 0.85% on disturbed and broken reef, 1,302½ feet or 12.80% was not on reef, and 476 feet or 4.70 % was done as prospecting work principally in connection with the Main Reef Leader and South Reef. Exclusive of 7,942½ feet of shaft sinking, the total footage accomplished since the company's inception now amounts to 72,652½ feet. Further particulars regarding development footage will be found under Annexments "A" and "B."

Ore Reserves.—The payable ore developed or exposed at December 31st, 1911, amounted to 644,300 tons at 6.0 dwts. over an estimated stoping width of 60.6 inches. This reserve comprises: 310,500 tons on Main Reef at 6.06 dwts. over 61.87 inches, 329,400 tons on South Reef at 5.98 dwts. over 59.78 inches, 4,400 tons on Main Reef Leader at 9.11 dwts. over 39.78 inches. Total, 644,300 tons, averaging 6.04 dwts. over 60.56 inches. By classifying the blocks under various values the following figures are obtained:—24 blocks or portions averaging 4½ dwts. and under 83,630 tons at 4.17 dwts. over 57.88 ins., 18 blocks or portions averaging over 4½ dwts. to 5 dwts. 136,500 tons at 4.78 dwts. over 57.36 in., 21 blocks or portions averaging over 5 dwts. to 6 dwts. 101,870 tons at 5.48 dwts. over 61.51 in., 20 blocks or portions averaging over 6 dwts. to 7 dwts. 205,500 tons at 6.65 dwts. over 64.14 in., 11 blocks or portions averaging over 7 dwts. to 8 dwts. 56,770 tons at 7.51 dwts. over 70.94 in., 10 blocks or portions averaging over 8 dwts. 60,030 tons at 9.04 dwts. over 52.01 in. Total, 104 blocks, containing 644,300 tons at 6.04 dwts. over 60.56 in. Approximately 39,700 tons of ore, which were included as payable in the ore reserves at the end of 1310, have been omitted from the above estimates, because the additional information now available indicates too low a value to warrant inclusion. Since the inception of the company, approximately 1,568,000 tons of ore classible as payable have been dealt with, or remain exposed in the mine. Actual value, recovery and cost—The following shows the value and recovery per ton milled, also the working revenue, cost and profit:—Recovered by amalgamation 3.96 dwts. per ton, 67.9 per cent.; recovered by cyanide treatment 1.59 dwts. per ton, 27.3 per cent.; total recovery 5.55 dwts. per ton, 95.2 per cent.; unrecovered value in residues .28 dwts. per ton, 4.8 per cent.; total actual value of ore milled 5.83 dwts. per ton, 100.0 per cent. Revenue from gold £366,406 2s. 7d, per ton £1 3s. 3.02d.; working cost £295,588 16s. 1d., per ton 18s. 9.09d.; working profit £70,817 6s. 6d., per ton 4s. 5.93d. Further details will be found in the attached schedules. Surface Equipment.—The following are the principal additions and improvements which have been completed or undertaken during the year: Completed—An addition of six treatment vats and one precipitation box to the cyanide plant. A change room at the west shaft for native miners. The erection of a 20-inch x 48-inch Cochrane hoisting engine at the east shaft. The addition of two new Stirling boilers to the boiler plant at the west shaft. The removal from the west shaft and re-erection at the east shaft of two Fraser and Chalmers' boilers. The building of two cottages for the compound staff and the addition of a twenty-eight bed ward to the native hospital. The erection of the Cochrane hoisting engine was undertaken in order to relieve the old Whiting hoist and to facilitate sinking. It had, however, been at work for only a fortnight when an unfortunate accident wrecked it so badly that the Whiting engine had to be recommissioned. Native Labour—The average number of natives per month in the company's employ during 1911 was 2,594, as compared with 2,080 during 1910. The advantage derivable from these greater numbers has, however, been nullified to a large extent by the all-round increase in native labour expenses coupled with a decrease in efficiency. During 1911, the average number of tons of ore hoisted per month per native in the compound was 11.25 tons, as compared with 13.00 in 1910. The cost of native labour per ton milled in 1911 was 5.057s., as compared with 3.964d. in 1910, while the average earning per calendar month per boy in compound was 37.95s. in 1911, as against 38.53s. in 1910. The company's machinery and plant has been maintained in good condition. The usual schedules of development, recovery records, and costs are attached. I desire to record my appreciation of the services rendered by the mine staff and company's employees generally.

New Spes Bona.

The report of the directors for 1911 states that the property remains as at 31st December, 1910, and consists of 25 claims on the farm Doornfontein No. 24 (old No. 140), together with lease of portion of Mynpacht No. 9, granted by the Meyer and Charlton Gold Mining Company, Ltd., two water-rights, and six machine stands, all of which are still under tribute by Messrs. Linklater and Beaton. The royalty received during the year, namely, five per cent. on the total gold won, amounted to £4,118 2s. 1d. Further revenue of £104 was received, being rent obtained from the letting of a house on the property belonging to the company. The expenditure totalled £304. The liability to the Johannesburg Consolidated Investment Company, Ltd., has been reduced by £3,965 during the year.

THE FLOTATION OF LEEUWPOORT TIN MINES.

Company with £275,000 Capital—Prospects of the Property "Excellent"—Chairman of African Farms Gives Details—General Manager's Report on Property and its Promise.

THE long-expected flotation of Leeuwpoort took place this week. At the African Farms' meeting, Mr. Jeppe announced that the hopes the directors entertained as to the value of the property have been more than realised during the year under review. He pointed to the full statement of the position by Mr. J. Irvine Jameson, whose special knowledge gained by him as the manager of the Rooiberg Minerals and other tin mines, has been of great service. This venture is now being floated, together with portion of the adjoining farm Rietfontein No. 490, into a mining company, of which Mr. Jameson has been appointed general manager. The following are the proposed terms of flotation as given by Mr. Jeppe:—The company is to be called "Leeuwpoort (African Farms) Tin Mines, Limited," and will be registered under the Companies Act of 1909. The capital is to be 275,000 £1 shares, of which the vendors will receive 112,500, and the working capital will be £162,500, the directors to have the right to increase this capital by the issue of 25,000 shares. The participants have fully subscribed for the working capital. The property will consist of Leeuwpoort No. 938, Rustenberg, the freehold of 1,193 morgen, 443 square roods, the freehold of undivided half of 2,770 morgen, 93 square roods, and the option to purchase in freehold the remaining half of above; as well as the mineral rights on 1,099 morgen, 84 square roods of the farm Rietfontein No. 940, adjoining Leeuwpoort. £50,000 of the working capital will be paid to vendors as refund of part of expenditure incurred.

RESULTS TO DATE.

The following short resume of the work done and results obtained on this property was given by Mr. Jeppe:—

> Among a number of discoveries, six distinct and separate payable ore bodies have been developed; 10,142 feet of driving and shaft sinking has been accomplished. Included in this footage two main shafts have been sunk on the incline, to a depth of 257 and 435 feet respectively. Good values are exposed at the bottom of most of the shafts. The total tonnage and value of milling ore exposed—developed and at grass—is 80,097 tons, value at £235,611, allowing for 80 per cent. extraction on milling and 10 per cent. to 20 per cent. on sorting, and an average stoping width of 36 inches metallic tin at £180 per long ton. Two of the developed lodes—west and spruit workings—have been struck in boreholes at 292 feet and 275 feet vertical depth respectively, both giving good values. These results prove the existence of the west and spruit lodes to a depth on the incline of about 600 feet and 400 feet respectively. On the strike the spruit lode (or a parallel lode) extending both north and south from the No. 1 incline shaft has been proved for a distance of about 3,200 feet. Shafts sunk on this lode show good values, noticeably at the extreme limits. Should it be necessary to construct a dam to conserve water, several suitable sites exist, the catchment area being extensive enough to provide the necessary supplies for all reduction and concentrating purposes. At the present time No. 1 incline shaft (spruit workings) furnishes 80,000 gallons per diem. It is hoped that sufficient water may become available for economically treating the alluvial deposits on the property, on which a series of tests have resulted in an estimate of over two and a half million cubic yards, worth at least 2s. per cubic yard (met. tin at £180 per long ton). Plans are now being prepared for a reduction plant to treat 150 tons per day, and it is calculated that by the time this plant is erected the ore reserves will place the mine about two years ahead of the mill.

The report of the general manager, Mr. J. Irvine Jameson, for the year ended 31st December, 1911, embodying results of development to end of February, 1912, states:

> "I beg to submit my annual report dealing with the results of operations on your property—Leeuwpoort No. 938, District Rustenburg—during the year ended 31st December, 1911. In addition a brief statement is made, giving the results of further work since the beginning of the present year, which shows the position and general prospects of your property at the present date (end of February). Results of operations during 1911: (1) Development and exploration: The development work for the year has disclosed the existence of payable ore bodies at several points, the chief points being: (1) Spruit workings; (2) Nek workings; (3) "C.N." south workings; (4) west workings; (5) "H.G." workings; (6) quarries workings. The quarries section is an open-cast working The total footage made during the year at the first five sections was 6,735, equal to an average rate of 561 feet per month. At the quarries section, during the first ten months of the year, a considerable tonnage of ore was placed at grass. The above development work consisted mainly of shaft-sinking and driving on the various lodes located. Exploration work proper has only been undertaken on a more extensive scale since the beginning of the present year. Main shafts: The two main shafts, No. 5 incline (west workings), and the No. 1 incline (Spruit workings) had been sunk to a total depth of 219 feet and 372 feet, respectively, at the end of the year, the whole of this footage having been accomplished during the year. Ore reserves: An estimate of the milling ore exposed, developed, and at grass, was made in my report, dated 11th December, 1911. The summarised figure showed that at the end of November, 1911, the position was as follows:—Total ore at grass, 11,221 short tons, value in metallic tin, 2.42 per cent.; total ore exposed—developed, 56,104 short tons, value in metallic tin, 2.24 per cent.; total, 67,325 short tons, total value in metallic tin, 2.27 per cent.; the total value being £195,514, and the value per short ton 58s. 4.4d. Since that date, during December, 1911, the increase in the reserves has been as follows:—Ore at grass, 1,199 short tons, value in metallic tin, £3,451; ore exposed—developed, 6,221 short tons, value in metallic tin, £19,826; total short tons, 7,420, total value in meallic tin, £23,277; the grand total to the end of the year being: short tons, 74,745, metallic tin value, £218,821. There has been no shortage in the number of natives seeking employment during the year. The before-mentioned development work, with the attendant results, has raised your property from a prospecting venture to a mining basis. Further results since the beginning of 1912: During the foregoing months of January and February, this year, development work has been steadily pushed ahead. In addition, exploration work on the extension of the Spruit lode, and the new strike has been undertaken with very gratifying results. The results are as follows:—Main shaft sinking, 101 feet; development, 1,226 feet: exploration, 351 feet; total, 1,678 feet; also some 500 feet of trenching. The result of this work has been an increase in the ore reserves, as follows:—Ore at grass, 892 short tons, metallic tin value, £2,798; ore exposed—developed, 4,460 short tons, metallic tin value, £13,992; total, 5,352 short tons, total metallic tin value, £16,790; the grand total to date (March, 1912), being 80,097 milling tons, of total value £235,611, allowing 80 per cent. extraction on milling, with 100 per cent.—20 per cent. sorting, and an average stoping width of 36 inches. Reduction works: The question of a power plant and reduction works, to be erected on a suitable site, has been given careful consideration; preliminary plans with estimates are being prepared. Surface works: buildings, equipment, etc.: The erection of a combined carpenter and smith's shop at the Spruit section, together with the necessary gear and plant, has been completed. A mealie-meal store and small kitchen have been erected near the compound. A mine general store has also been erected near the smith's shop. The small Holman winch and boiler, at the Spruit section, have been housed. The pumping station at the No. 5 borehole is being erected; the oil engine, pumps, etc., are being placed in position. The erection of the small Holman double-drum winder and headgear at No. 5 incline shaft (west workings) has been started. General remarks: The results of the operations to date have been very satisfactory. Some difficulty has been experienced in sinking several shafts, owing to the comparatively large amount of water encountered: this difficulty will largely be overcome when the Spruit pumping station is in commission—within three months from the present date. The later development results have so far shown the lode fillings to increase in both value and width with depth, which is a distinctly encouraging feature. One result of the exploration work has been to prove the extension of the Spruit lode, both north and south (or a parallel lode), for a considerable distance; also the values and widths disclosed have been most encouraging. In conclusion, I consider that the prospects of the property in every way are excellent."

Mr. A. P. Rouillard, manager of the Durban Deep, went on a holiday to Europe this week.

* * * *

The Board for the Protection of Mining Interests in the Territory of Griqualand West consists of the following persons for the year 1912:—As representing De Beers Mine, Messrs. Charles Edward Nind and Francis Oats; as representing Kimberley Mine, Colonel Sir David Harris, K.C.M.G., and Mr. Alpheus Fuller Williams; as representing the Bultfontein Mine, Messis. William Pickering and Friedrich Hirschhorn; as representing Du Toits Pan Mine, Messrs. Thomas Gilbee Tyson and James Mason Jones.

THE MINERS' PHTHISIS MEDICAL COMMISSION'S REPORT.—I.

Important Recommendations—Extent of the Evil—Drastic Reforms.

The report of the Miners' Phthisis Commission, which was placed on the Table of the House of Assembly this week, forms a volume of some seventy or eighty pages. The recommendations are contained in a number of paragraphs at the end of the report. The Commission recommends that the following provisions be incorporated in any measure providing for compensation or insurance against miners' phthisis: Compulsory medical examination of workmen prior to their first employment underground in South Africa. The Commission adds that a considerable number of men came to work in the mines who were physically unfit for underground work. On the Rand, it says, no man should undertake, or be accepted, for mining work in any mines which is likely to produce fibrosis of the lung unless his physical condition is good, though such a man might be able to engage in coal mining or in other mining operations in South Africa which are not carried out in hard rock.

Taking into consideration all the circumstances regarding the serious incidence of lung disease among miners on the Rand, the Commission recommends that a man applying for the first time to be employed underground in any mine for work which is liable to produce fibrosis of the lungs should be the bearer of a medical certificate signed by a duly qualified medical practitioner that he is of good physique and capable of undertaking underground work in hard rock mines, and that he is free from pulmonary tuberculosis of the lung.

Medical Certificates.

It should, the report continues, be an offence thereafter to employ any man who does not hold such a certificate stamped with the name of his first employer and the date of his first engagement. It should be at the option of the employer to require that an applicant for work should be examined and certified by a medical practitioner designated by the employer at the expense of the latter. Further, every workman applying for a blasting certificate should be required to produce such a medical certificate in the same manner as is prescribed for applicants for a certificate as engine-drivers. In the latter stages tuberculosis becomes commonly or invariably superimposed on this condition, and the type of disease becomes that of tuberculous infection in a fibroid lung. The paragraph also lays down that pure tuberculosis undoubtedly occurs to a certain extent among underground workers, but such are not cases of miners' phthisis as defined above.

Description of the Disease.

The Commission recommends that phthisis should be described by various diseases defined in paragraph thirteen. This paragraph says:—Miners' phthisis is a chronic disease of the lungs characterised by progressive fibroid changes in lung tissue and pleura and accompanied by chronic catarrh process in the air cells and respiratory passages. The disease is thus primarly a fibrosis of the lung, and the essential factor in producing this condition is more or less continuous inhalation, over long periods, of fine rock dust. All true cases of miners' phthisis are thus primarily cases of silicosis. Silicosis is the feature common to them all. The recommendation proceeds: The presence of silicosis (fibrosis of lung) must be proved before a case can be held to come under the definition of miners' phthisis

Payments and Stages.

The Commission suggests the allocation of a definite sum as payable for each stage of the disease, which should number three: (1) The stage of early fibrosis, which should comprise those cases uncomplicated by tuberculosis; (2) The intermediate stage, including the cases of intermediate fibrosis, in which there is unmistakable evidence of the presence of pulmonary fibrosis with definite impairment of working capacity. Cases of "early fibrosis," complicated by tuberculosis, should also, from the point of view of compensation, be regarded as falling into that class. (3) The advanced stage, comprising men suffering from fibrosis, who are physically unable to continue underground work, or any work involving manual labour in the ordinary sense, and also men suffering from intermediate fibrosis "in conjunction with tuberculosis."

Board of Referees.

The Commission proceeds:—"In view of the difficulty of diagnosis existing in this disease, it is, in our opinion, necessary to constitute a Board of Referees, appointed by the Government, the members of which should have special previous experience of the disease. The Board should consist of not more than six members." Two members of this Board should examine claimants for compensation to decide the nature and stage of the disease, the two members having the right to call in a third. Compensation for the intermediate and advanced stages should, the Commission thinks, take the form of a pension or annuity. The report then contains the following paragraph: "No man who has received compensation owing to his being affected by miners' phthisis in any stage or degree should be permitted to resume work underground at any time." Finally, the Commission consider pulmonary tuberculosis should be scheduled in the list of diseases which are compulsorily notifiable, the measure to apply to the whole population, white or black, in all proclaimed labour areas.

Division of the Report.

The report is divided into three main divisions, part one giving a short description of mining operations on the Rand and a brief historical review of previous inquiries. Part two sets out the results obtained from the present investigation, while part three discusses the provisions which should be included in any proposed legislation. There are also several appendices dealing with the more technical aspects of the investigation. Part one describes the reef and methods of ventilation on the mines, their temperature and humidity and the operations of underground work. It also describes the effect of machine drilling, asserting that its effect on dust production is not localised, but affects all men employed underground owing to the large amount of dust thrown into suspension and carried through all the workings of the mine. Another paragraph gives the duties of underground workers. Section (b) deals with the definition of miners' phthisis, and quotes at some length from the reports of previous inquiries into the incidence of lung diseases among metalliferous miners. It also deals with inquiries in Cornwall and Australia. As a result of all these inquiries the Commission says two facts stand out: (2) The prevalence of fibroid phthisis as a specific occupational disease among metalliferous miners working in hard rock, and (2) they all lead to the same conclusions as to the nature and causation of miners' phthisis. The report proceeds to discuss the pathology of miners' phthisis, and lays down the primary condition found in all true cases of miners' phthisis, namely, that all are primarily cases of silicosis. The symptoms and stages of the disease come under review, as well as the supervention of tuberculosis. Paragraph 13 then defines miners' phthisis, as stated above. In clause 14 the Commission expresses its decision to retain the term "miners' phthisis" in preference to "silicosis," which more accurately defines the pathology of the case, and classify the types of the diseases as non-tuberculous and tuberculous.

Results of Investigation.

Part two deals with the results of the present investigation. Representative mines are chosen for the purpose, and an attempt made to examine all underground men on these properties. Three thousand one hundred and thirty-six underground miners were examined and their histories obtained, while in addition three hundred and twenty-six cases were examined in the special examination. Then the mortality records were consulted, but they were only of secondary value, as a certain number of the men who contracted the disease on the Rand died elsewhere. Post-mortem records were also consulted, but very few post-mostem examinations on cases of miners' phthisis had been carried out previous to the appointment of the Commission. The report then goes on to classify the stages of miners' phthisis. Class one includes cases where no definite physical signs of its presence could be found. Class two contains those who showed undoubted, though frequently slight physical signs of the disease, but whose working capacity was not impaired. Class three comprises more advanced cases with a definite degree of physical incapacity accompanied by intermediate fibrosis, while class four represents the terminal condition, with absolute incapacity for work.

Mining Population.

Section (2) discusses the constitution of the mining population. It says that the mean age of all the miners examined was 33.12 years, and that 35 per cent. of them were of South African birth, while 51 per cent. were born in the British Isles. The remaining 14 per cent. came from other British possessions and foreign countries. The report says in this connection: "There is no doubt that mining on the Rand is attracting a considerable and growing number of South African recruits. These young men begin their mining life cheerfully in the less skilled occupations, and gradually work their way into more highly skilled, and therefore better paid, position. The effect of miners' phthisis on this group of men, carrying with it the risk of dissemination of tuberculosis among those with whom they are brought into social contact, and operative as it is on them when at the prime of life, is therefore of greater importance to the white population of the Union. Of the miners examined, 44 per cent. had no previous occupation, while 57 per cent. of the miners were married men with an average family, consisting of a wife and two children. Of this number 84 per cent. have their families resident in South Africa. "It will thus be seen," the report adds, "that the mining population of the Rand is mainly a resident and stable population. Any economic loss there from disablement arising from among these men or any claim on the part of their dependents will fall directly on the people of this country." The reports also comments on the frequency with which men move from mine to mine.

(To be continued.)

THE PRINCESS ESTATE IN 1911.

The Transition Period—Normal Profits Expected from Better Labour Supply and Utilization of Full Crushing Capacity.

UNDER the amalgamation scheme, it will be remembered, the Princess Estate absorbed the Roodepoort Central Deep and West Roodepoort Deep companies as at the 1st January, 1911; consequently the accounts of those two companies covering the period from that date until they were placed in liquidation, namely, 24th March, 1911, have been incorporated in the latest accounts and statements of the Princess Company. During January and February, 1911, the charge for redemption of mine development was 3s. 6d. per ton crushed at the Roodepoort Central Deep mill, and 3s. per ton crushed at the Princess mill; for the remainder of the year a uniform charge of 3s. per ton crushed was maintained on the amalgamated property. The balance of mine development account at the 31st Dec., 1911, stands at £69,716 0s. 3d.; equal to 1s. 11·9d. per ton on the estimated tonnage of 700,800 tons of payable ore developed in the mine at that date. The funds at the disposal of the Princess Company having become exhausted towards the end of the year, arrangements were made with Messrs. A. Goerz & Co., Ltd., by which that firm agreed to advance to the company further funds required from time to time on current account, all such advances to bear interest at the rate of 6 per cent. per annum. The balance sheet shows that the amount owing by the company to Messrs. A. Goerz & Co., Ltd., at the 31st December, 1911, was £15,065 13s. 5d. The centralisation of the surface plant, putting into order of the shafts and connecting up of workings of the properties acquired, and pushing on of mine development, entailed very heavy expenditure, and in addition to the nett liabilities of the Roodepoort Central Deep, Ltd., and West Roodepoort Deep, Ltd., as at 1st January, 1911, assumed by the company, an amount of £159,277 16s. 2d. was expended on capital account during the past year. The profit in respect of the mining operations for the year amounted to £21,215 14s. 8d. The total value of the yield was 29s. 10·837d. per ton milled. The working cost (including development redemption) was 26s. 11·904d. per ton milled; leaving a profit of 2s. 10·933d. per ton milled. The yield of gold was—From the mill, 4·322 dwts. fine gold per ton milled; from sands and concentrates, 2·188 dwts. fine gold per ton milled; from current slimes, 0·227 dwts. per ton milled; from accumulated slimes, 0·322 dwts. fine gold per ton milled; total, 7·059 dwts. fine gold per ton milled. The profit and loss accounts show:—Credit balance brought forward from 1910, £2,829; profit on mining operations during 1911, £21,215; interest, £576; rents, £1,598; old material sold, £52. Estate revenue:—Licences, £2,231; water rent, £650; total, £32,155. Against which the following amounts have been charged, namely:—Debenture interest, trustees' fees, and redemption premium, £1,260; directors' additional remuneration, £937; contribution to Miners' Phthisis Sanatorium, £233; assessment—miners' Phthisis allowances fund, £246; dividend No. 8 (5 per cent.), £28,751; French fiscal taxes, £177; donations to charities, £186; sundry payments, £2; total, £31,796; less profits tax adjustment for 1910, £14; total, £31,782; leaving a balance of £372 13s. to be carried forward to the credit of profit and loss account at the 31st December, 1911.

CONSULTING ENGINEER'S REPORT.

The Consulting Engineer, Mr. W. McC. Cameron, writes, *inter alia*: As from the beginning of the year, the company absorbed the outcrop property of the Norman Properties Syndicate, Ltd., on the west, and the two deep levels of your area, the Roodepoort Central Deep, Ltd., and West Roodepoort Deep, Ltd. The reduction plant of the Central Deep was remodelled and its capacity increased by adding five tube mills, the sands plant increased and crushing station altered so that ore from the whole amalgamated area can be treated in the one plant. At the same time the slimes plant was increased in size to treat the additional tonnage. The mine has now a modern and centralized plant capable of securing the maximum yield from the ore treated. This new plant was put into commission in December, and the old Princess mill shut down. During the year the old reduction plant was kept running, and that of the Roodepoort Central Deep in so far as possible. Unfortunately, owing to troubles in the shaft on this latter section, the mill could not be kept supplied with ore, and in July it became necessary to close this Central Deep shaft down entirely in order to replace the timber around the bend at the bottom of the vertical and in the incline portion of the shaft from the 3rd to the 8th level. Advantage was taken of this closing down of the shaft to put in much-needed new skip-roads. This shaft was again put into commission in November, and since that time, as far as the mine is concerned, the tonnage required for the mill could be easily produced, but the native labour force available for underground work has been wholly inadequate for the needs of the property. In January 1,964 boys were employed underground on the Princess and Central Deep, while only 1,192 boys were so employed in December. The properties which had been acquired from the Norman Properties Syndicate, Ltd., and West Roodepoort Deep, Ltd., have been unwatered, shaft repairs made, underground alterations completed, pumping plant installed, hauling engines erected, and are now in condition to produce ore when labour is available. Meanwhile pumping operations only are being carried on in these areas. During the first six months of the year a working profit, including sundry revenue, of £31,157 was earned, while after the necessary closing down of the Roodepoort Central Deep shaft in July and consequent restrictions of tonnage which could be sent to the mill, the monthly results for the remainder of the year show small profits or losses, and a net loss for the six months of £1,832, a result which was also largely brought about by the starting up of the new reduction plant at the end of November and beginning of December, when a large absorption of gold in the tube mills and new zinc extraction boxes took place. As native labour increases and a larger tonnage can be produced, and costs thereby reduced, the company will return to a profit-earning basis. The yearly re-measurement of ore reserves gave the following results:—Payable: South Reef, 544,500 tons, assaying 7·47 dwts. over a milling width of 25·1 inches; Main Reef, 112,000 tons, assaying 6·27 dwts. over a milling width of 50.2 inches; total, 656,500 tons, assaying 7.26 dwts. over a milling width of 27·4 inches. In addition to the above, there are developed in the mine, shaft pillars and ore unavailable at present, as follows: South Reef, 37,600 tons, assaying 10·53 dwts. per milling ton; Main Reef, 6,700 tons, assaying 7·38 dwts. per milling ton; total, 44,300 tons, assaying 10·05 dwts. per milling ton. Unpayable Ore: South Reef, 106,800 tons, assaying 4·84 dwts. per milling ton; Main Reef, 193,700 tons, assaying 2·08 dwts. per milling ton; total, 300,500 tons, assaying 3·06 dwts. per milling ton. From the payable reserves a yield of 92 per cent. of the mine assays, as given, may be expected, but allowances must be made for low-grade ore from development work which will be milled at the same time. The payable developed reserves stand in the books of the company at £69,716, or 1s. 11·9d. per payable ton, and 3s. per ton milled is being written off for development redemption. For reasons explained above, no development work was done in the Central Deep section during the last half of the year, but the work done in the earlier part of the year furnished the most encouraging feature of the year's work. The ore in this section had shown a constantly decreasing value with depth, which has given way to an increase in value in the 11th level over that in the 10th level, and a further increase in the 12th level, in so far as driven (585 feet) over the 11th level. Work will be pushed in these levels during the coming year. Development had to be largely confined to South and Main Reefs in the old Princess section in areas previously thought to be of low grade, and the percentage of payable ore disclosed has therefore been less than would have been the case otherwise. The working results to be obtained from the property in the immediate future depend in the first instance on the supply of native labour, which is becoming much more expensive to acquire, more difficult to obtain and more highly paid as to wages through the keen competition of the mines. At the time of writing, however, the supply is being increased, and there is good reason to except that the mine will soon be crushing to its full capacity, when returns will become normal.

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THE RANDFONTEIN DEEP TO-DAY.

Reasons for Suspension of Operations.

Shaft sinking in both shafts at the Randfontein Deep was continued until the early part of 1911, when, as was mentioned in the Chairman's speech at the last annual meeting, it was considered advisable, after taking into consideration the financial position of the company, to discontinue sinking the south shaft, work in the north shaft being continued. Since the reports for 1911 were written, the directors considered it advisable to suspend operations, as the funds in hand are insufficient to reach the reef, and the present time is considered inopportune to raise the necessary capital on reasonable terms. There was an increase in the capital expenditure during the year of £66,527 1s. 4d. Of this amount £61,752 19s. 7d. was expended in the sinking and equipment of the shafts. The general expenditure for the year was £14,231 19s. 6d., against which £4,929 8s. 6d. was received for rents, interest, etc.

Consulting Engineer's Report.

The Consulting Engineer, Mr. James G. Lawn, writes, *inter alia:* As it became clear early in the year that the funds in hand would not be sufficient to sink both the north shaft and the south to the Randfontein Leader, it was decided to stop one of them. As there was reason to think that the north shaft would strike the reef at a shallower depth than the south shaft, and as the air compressor was erected at the north shaft, it was decided to stop the sinking of the south shaft. The north shaft was sunk 971 feet during the year, and on December 31st had attained a depth of 2.014 feet. Unfortunately, broken and fissured ground was met with from 1,025 feet downwards, and a constant succession of water feeders was struck, so that, although both electric and air pumps were used, a considerable quantity of water had always to be handled in the bottom of the shaft by means of the sinking skips. This made sinking both slow and costly. The ground met with was good for sinking, and, could the water have been caught up and kept out of the bottom of the shaft, rapid progress would have been made. The property is undoubtedly one of very great promise, and it has been a matter of constant disappointment that such persistently recurring difficulty has been met with in the sinking of the shaft. However, it is hoped that the fissured zone will be passed through and better progress in sinking secured.

Manager's Report.

The Manager, Mr. H. E. G. Stephens, writes, *inter alia* :—During the year work was carried on continuously in the north shaft. The depth at the end of December, 1910, was 1,043 feet from surface, and at the end of December, 1911, was 2,014 feet from surface. The total footage sunk during the year 1911 was 971 feet. The formation from 1,043 feet to 1,400 feet consists of light blue quartzites, well bedded and fairly regular, the general strike being approximately north and south, and the dip averaging 43 degrees to the east. A dyke, striking north and south and dipping 42½ degrees to the east, entered the shaft from the west end at 1,424 feet; and further down, at 1,726 feet, a similar dyke, striking 10 degrees north of east and dipping 48 degrees to the east, came in from the same side. Between these dykes the formation in places is regular, but immediately above and below it is much broken and disturbed, no doubt owing to these intrusions. From 1,650 feet to the bottom both light and dark blue quartzites occur, the dark blue quartzites for the most part being very coarse grained and gritty, with occasional scattered pebbles. These quartzites are liberally interspersed with stringers of pyrites, and several bastard reefs were encountered. At a depth of 1,025 feet a considerable amount of water was encountered, which continued to increase. It was deemed advisable to cut a permanent pumping station at 1,250 feet. Here two Gould's electric pumps were installed, and later another was added. Further increases were made at intervals as sinking proceeded, and it became necessary to get the air compressor to work and put in a number of air pumps. The total quantity of water being drawn from the shaft at the end of the year was about 600,000 gallons per 24 hours. The total expenditure for sinking in the north shaft was £44,027 17s. 10d., an average of £45 6s. 10d. per foot sunk. Increased water is responsible for the slower rate of sinking. The shaft is equipped with guides, ventilating chimney, signalling apparatus, etc., throughout. The annexed statement gives particulars of the footage accomplished in the north shaft monthly, together with the cost. The south shaft had been sunk 400 feet to a total depth from surface of 1,650 feet, when work was suspended at the end of March, 1911. The total cost of the 400 feet sunk amounted to £11,506 17s. 8d., being an average of £28 15s. 4d. per foot. In addition to the equipment referred to in the last annual report, it was found necessary to remove a Worsley Mesnes hoisting engine from the old workings on the Horsham series to the north shaft, to assist in the work of cutting the 1.250 feet pumping station referred to above. Since the commencement of the year, the Victoria Falls and Transvaal Power Company's line has been brought to the property, and that company's power is used for driving the electric pumps in the shaft and for lighting purposes. The buildings referred to in the last annual report as being in course of erection have been completed, and the cottages and rooms have been kept in repair. Native labour has been sufficient for the limited requirements of this mine, and the efficiency has been good.

PROSPECTS OF THE GEDULD PROPRIETARY.

Increased Profits and Improved Yield—Question of Ore Reserve Assay Values.

During 1911 the Geduld made profits in respect of mining operations amounting to £35,040 18s. 4d. The total value of the yield was 26s. 9·095d., working cost (including development redemption) was 21s. 8·532d., leaving a balance of 5s. 0·563d. per ton milled. The yield of gold was :—From the mill 2·923 dwts., cyaniding sands and slimes 3·387 dwts., total 6·310 dwts. fine gold per ton milled. The profit and loss account shows:—Credit balance from 1910, £22,681; profit on mining operations for 1911, £35,040; interest, £611; rents, £2,051; water sold, £1,819; interest on investment, £40; owner's share of licences, £212; old material sold, £150; bearer share warrants, £42; making up a total of £62,650. Against this the following amounts have been charged, viz.:—French fiscal taxes, £457; contribution *re* Transvaal Miners' Phthisis Sanatorium, £84; contribution *re* Miners' Phthisis Allowances Fund, £181; donations to charitable objects, £186; depreciation of stores, £615; written off mine development, £40,000; total, £41,525; leaving a balance of £21,125 to be carried forward to the credit of profit and loss account at the 31st December, 1911. A sum of £88,764 was spent on capital account during the year.

Consulting Engineer's Report.

The Consulting Engineer, Mr. W. McC. Cameron, writes, *inter alia:* The tonnage treated was increased by 11,190 tons as compared with the previous year, and the yield per ton increased by 3s. 3d. to 28s. 9·1d. Working costs amounted to 21s. 8·5d. per ton milled, including 4s. 6d. per ton for development redemption, an increase in costs of 8d. per ton over the previous year, which is largely accounted for by the increased cost of native labour. The working profits, including £4,928 sundry revenue, amounted to £39,969, as compared with £20.634 in 1910. The rate of sorting has been well maintained, an average of 17·5 per cent. of waste rock having been discarded from the tonnage mined, but the milling width has increased to 43·3 inches, mainly due, however, to an increased width of reef. An actual extraction of 90·95 per cent. of the value of the ore milled has been obtained in the reduction works, which, considering the characteristics of the ore, must be considered satisfactory. The capacity of the air compressing plant was nearly doubled during the year, which when completed in October enabled machine work in the stopes to be undertaken to a much larger extent, a method of breaking ore which through improvements effected in rock drills and methods can be still more extensively applied in the mine. Of the ore sent to the crusher station, 19 per cent. was broken by machines, 64 per cent. by hand, and 17 per cent. came from development work. Development was considerably increased, 16.825 feet having been done during the year as against 12,415 feet in 1910, and on the whole with very encouraging results. The main incline from No. 2 shaft was sunk a further distance of 1,842 feet, when sinking was stopped for the present. The reef was thrown by faulting a considerable distance above the incline, and owing to the flat dip of the reef, about 5 degrees, it was only intersected at a distance of 3,240 feet from No. 2 shaft. Where picked up the reef was of very good value, the drive at this point for 748 feet sampled giving an average value of 17·13 dwts. over 40 inches, and the drives both north and south are continuing in good ore. Raises and winzes from this level have been started, and all available faces in this area will be pushed ahead as rapidly as possible. Intermediate drives between No. 2 shaft and the bottom of main incline or No. 2 level are being opened up by means of subsidiary inclines to the reef. To the south of No. 2 shaft good bodies of payable reef are being opened as well as in the north-western portion of the property, and the ore reserves have been largely augmented at these points. At No. 3 shaft the main incline was carried to a point 995 feet from the bottom of the vertical shaft and a crosscut started to the reef. Other development work at this shaft was limited to openings tributary to the main east and west levels, where small bodies only of payable reef were disclosed. All development work at this shaft has been stopped temporarily, because it can be done more cheaply at a later period, when a second connection, which will be completed in a few months' time, is made between the main drives and No. 2 incline shaft and all rock hoisted through No. 2 shaft. No additional water of importance was encountered during the year, and the water pumped from the mine was reduced by 3·5 million gallons in December, 1911, as compared with December, 1910, while the total has decreased over 1910 by over 46 million gallons to 627 million gallons for the year. Additional pumping plant with about one-half million gallons capacity per 24 hours was installed in No. 2 main incline, as a measure of safety. A re-measurement of the payable ore reserves was made at the end of the year, with the following results: Developed, 607,300 tons, on an assumed milling width of 44·2 inches, made available for mining by 11.445 feet of drives, raises and winzes on reef. Average lineal assay value of the above footage, 8·18 dwts. over 44·2 inches. Of the above tonnage, 82,000 tons are required to be left as pillars, and are unavailable for mining purposes at present. Indicated, 190.500 tons of payable ore by 4,975 feet of development work on reef. Average lineal assay of this footage is 9·08 dwts. over 42·6 inches. In connection with the assay values given, I beg to quote a paragraph from my report for 1910: "It will be noted that as usual the values are not applied direct to the tonnages. The reason for this was explained in detail in my report for 1908, but I would again call attention to the fact that in a mine such as this with its flat dip of reef, the development openings are a great distance (up to 1,000 feet) apart, and while developing the tonnage as far as is necessary to enable it to be mined, do not give sufficient information upon which to base an accurate estimate of the value of that tonnage. The values stated are the average of those obtained in these workings, and are simply given as such." The experience thus far gained in mining in these large blocks shows that the average assay values around the perimeter may be taken as roughly indicating the relative grade of one block as compared with another, but that they cannot be applied with mathematical accuracy to the tonnage within the blocks. The assumed milling width has increased because it has been found impossible in mining to always cut out the low grade hanging wall leaders, and because a wider reef is being developed in many places than in the past. The year's work has resulted in an increase in the payable developed and probable ore of 250,900 tons. The development account stands in the books at £131,665, or 3s. 3·6d. per ton of developed and probable ore, while 4s. 6d. is being written off for development redemption per ton milled, including ore sent to the mill from development work. In December, 1911, there were 1,288 natives in the employment of the company, as against 1,683 in December, 1910. The increased compressor plant and machine work has overcome to some extent, though not entirely, the effects of the reduction in labour supply, but the increased cost of that supply has adversely affected working costs.

GRADE, COSTS, AND PROFITS IN FEBRUARY.

Analysis of the Industrial Statistics for the Month.

The usual monthly analysis of the gold production for February issued by the Chamber of Mines is presented hereunder:—

The Witwatersrand

	Total value recovered.	Value recovered per ton milled.	Total working cost per ton milled.	Total working costs.	Working profit.	Working profit per ton milled.
	£	s. d.	s. d.	£	£	s. d.
1. Aurora West United ...	13,937	23 9	19 7	11,401	2,502	4 4
2. Bantjes Consolidated ...	34.678	31 8	25 9	28.201	6,026	5 6
3. Benoni Consolidated ...	18,953	19 7	19 7	18,616	8	—
4. Brakpan Mines	61,358	28 11	17 9	37.498	23,223	11 0
5. Cinderella Cons.	18,112	25 8	26 2	17,828	402	0 7
6. City Deep	62,535	32 5	22 2	41,981	18,783	9 11
7. City and Suburban ...	48,675	37 3	21 11	28,669	19.226	14 9
8. Cons. Langlaagte	27,016	24 6	19 1	19,301	7,714	7 8
9. Cons. Main Reef	26,939	30 7	22 3	19,538	7.004	8 0
10. Crown Mines	249,057	33 3	18 4	136,505	108,228	14 6
11. Durban Roodepoort ...	14,587	22 1	16 5	10.788	3.779	5 9
12. Durban Rood. Deep ...	32,440	29 6	24 10	27,286	4,698	4 3
13. East Rand Proprietary	242,465	33 0	22 8	163,647	75,609	10 6
14. Ferreira	30,299	26 8	17 0	18,102	9,962	9 4
15. Ferreira Deep	69,467	47 5	24 7	35,860	32,599	22 4
16. Geduld Proprietary ...	17,505	27 4	21 6	13,772	3,693	5 9
17. Geldenhuis Deep	81,246	28 6	23 5	66.475	13,694	4 10
18. Ginsberg	19,340	30 3	21 7	13,495	5,844	9 4
19. Glencairn Main Reef...	14.693	16 0	15 3	12.462	2.231	2 9
20. Jumpers-cum-Treasury	16,265	36 1	33 8	14.546	1,504	3 6
21. Jupiter	35.698	21 8	18 3	30.041	5.153	3 2
22. Knight Central	24,977	22 1	19 5	21,929	2,666	2 4
23. Knights Deep	50.514	18 10	12 1	32.322	17,596	6 7
24. Lancaster West	22,989	21 0	21 0	22,542	393	0 4
25. Langlaagte Estate ...	56.062	20 1	—	—	10,250	4 1
26. Luipaardsvlei Estate ...	17,199	19 0	17 9	14,145	2.009	2 6
27. Main Reef West	23,159	34 2	22 8	15,332	7,485	11 1
28. May Consolidated ...	16,927	29 9	17 5	9,654	7.138	12 11
29. Meyer and Charlton ...	26,383	40 3	18 4	12,042	14,386	21 11
30. Midas Deep	1,160	11 4	—	—	—	—
31. Modderfontein B ...	50,692	34 4	19 2	28.313	21,500	14 7
32. New Goch	26,446	22 0	19 4	23,218	3.164	2 8
33. New Heriot	21,349	40 8	23 7	11,905	9,152	18 1
34. New Kleinfontein ...	53,067	28 2	20 3	38,132	14,199	7 7
35. New Modderfontein ..	81,663	35 0	19 9	45,555	35,009	15 2
36. New Primrose	33,022	27 10	14 6	16,368	16,655	14 10
37. New Rietfontein	20,763	26 7	21 11	17,108	3,658	4 8
38. New Unified	16,192	31 4	23 3	11,670	4,526	9 0
39. Nourse Mines	76,799	29 7	22 3	56.805	19,005	7 5
40. Princess Estate	19.030	22 2	27 1	20,902	*2,108	*2 9
41. Randfontein Central ...	251.839	23 6	—	—	65.000	6 2
42. Robinson	108,882	47 11	18 10	37.089	70,023	31 10
43. Robinson Deep	76.782	32 6	17 3	40,734	35,038	14 10
44. Roodepoort United ...	27,581	20 3	18 9	25.534	2,209	1 7
45. Rose Deep	87.461	28 3	17 8	54,854	31,541	10 2
46. Salisbury	1,389	—	—	1,078	768	—
47. Simmer and Jack ...	78,940	24 0	12 5	40,086	38,147	11 10
48. Simmer East	24,586	17 4	15 1	21.323	2,911	2 1
49. Simmer Deep	41,573	18 8	16 7	36,846	4,140	1 10
50. Spes Bona Tribute ...	6,193	21 5	—	—	—	—
51. Van Ryn	51,695	27 7	15 6	29,114	23.030	12 3
52. Village Deep	71,689	30 1	20 6	48,468	22,084	9 4
53. Village Main Reef ...	61,736	40 6	21 9	32,632	27,184	18 2
54. Vogelstruis Estate ...	12,000	23 4	22 8	10,992	1,033	2 2
55. West Rand Central ...	3,768	27 8	28 1	3.660	109	0 10
56. West Rand Cons.... ...	32,130	22 11	21 7	29,458	2,707	2 0
57. Witwatersrand	40,736	23 5	15 4	26.776	13,959	8 0
58. Wit. Deep	48,908	27 2	19 2	34,560	13.708	7 7
59. Wolhuter	32,126	29 5	17 8	23,443	15,036	11 4
Miscellaneous producers	26,377	—	—	—	—	—
Witwatersrand totals	2,867,049	28 3	19 2 57 cos.	—	907,192 57 cos.	9 2 57 cos.

*Loss.

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

Outside Districts.

	Total value recovered.	Value recovered per ton milled.	Total working cost per ton milled.	Total working costs.	Working profit.	Working profit per ton milled.
	£	s. d.	s. d.	£	£	s. d.
Heidelberg—						
1. Nigel	18,983	30 7	24 8	14,798	3,974	6 7
2. Sub Nigel	7,867	37 11	34 8	7,202	543	2 7
Barberton—						
3. Barrett	973	5 1	—	—	—	—
4. Sheba	11,889	42 4	—	—	—	—
5. Sheba (Rosetta)	1,958	22 10	—	—	—	—
6. Worcester	5,148	25 1	—	—	—	—
Lydenburg—						
7. Glynn's Lydenburg ...	6,665	46 0	19 6	2,821	3,696	25 6
8. Transvaal G.M. Estates	30,201	49 1	23 6	14,346	15,334	24 11
Miscellaneous producers	39,099	—	—	—	—	—
Tl. (outside districts)...	132,783	36 2	25 0 4 cos.	—	23,547 4 cos.	15 0 4 cos.

A comparison of value recovered per ton milled, working costs and profits per ton with January shows that the value recovered on the Witwatersrand for January was 27s. 6d. or 9d. per ton less than for February. Working costs in February were 19s. 2d. as against 18s. 10d. for January, and as against 18s. 5d. for December. For January, 1912, 2,067,161 tons were milled; and now for February, 1.980,396 tons. In the outside districts the total tonnage milled in February was 45,744 tons, making a total for the Transvaal of 2,026,140 tons.

BEZUIDENHOUT VALLEY AND RIETFONTEIN GEOLOGY.—I.

Dr. Mellor Replies to Mr. Baring Horwood's Criticism—The Difference Between Assumption and Evidence—A Suggested Line of Section.

At the last meeting of the Geological Society of South Africa the following well reasoned and cogent reply was made by Dr. Mellor to the extremely interesting criticism of his views by Mr. C. Baring Horwood, which was published in our issues of the 17th and 24th February. The accompanying map, taken from Dr. Mellor's latest paper on the geology of the Lower Witwatersrand, shows the various points in dispute, the principal argument being that the Rietfontein series is an integral portion of the Lower Witwatersrand formation, and that the Orange Grove quartzite of Dr. Mellor, as shown south of Rietfontein, is really a portion of the Government Reef series. The mapping of the contorted bed east of Jeppes and south of Rietfontein is alleged by Mr. Horwood to be incorrect, and he suggests as an explanation that will simplify the whole problem, that the shales under discussion are the Coronation Shales. A reference to our sections of the 6th January last will make the argument more clear:—

In replying to Mr. Horwood's discussion of my recent papers on the Witwatersrand System it may perhaps be well first to point out that in those papers, and in the maps which accompany them, my main object was, not so much to advocate any particular view of local geology, as to present as clearly and completely as possible the available evidence, in such a way that any one interested in the question may examine it for himself, and thus be in a position to form his own deductions.

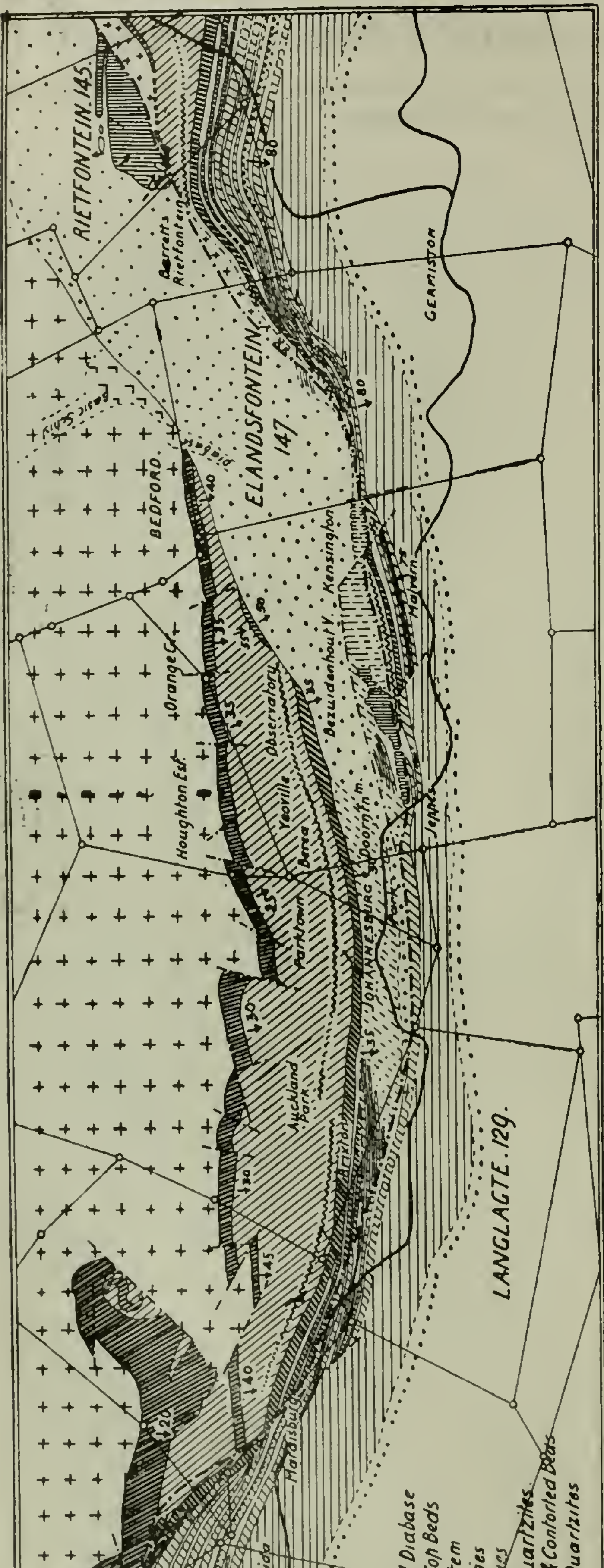
This Mr. Horwood has done, and in his discussion of my papers has stated his conclusions. As however no new evidence has been brought forward which might tend to modify any deductions drawn from that already presented, my reply may be confined to the consideration of some objections to Mr. Horwood's views and to clearing up some of the points in my paper about which there appears to be some difficulty.

Mr. Horwood's main contentions are, I believe, that there is no faulting of any great structural importance between Johannesburg and Rietfontein, that there is no duplication of the Hospital Hill Beds in the Bezuidenhout Valley, that the Rietfontein and Langerman's Kop Beds are normally interbedded, and occupy a definite horizon, in the Lower Witwatersrand System, that these beds should be found along the whole length of the Rand at a corresponding horizon, and that the Du Preez or Rietfontein Reef is to be correlated with the Promise and other reefs of the West Rand.

It may first of all be noted that this view is by no means new, but one which in all its essentials has, as is well known, been held for very many years by a number of supporters. It is indeed a view which, when only the broad outlines of the geology of the area are considered, very naturally suggests itself, and encouraged by the excellent results obtained from mining the Rietfontein reefs, its supporters have spared neither money nor energy in seeking for a similar reef at apparently correspondingly horizons along the whole length of the Rand. That the prospecting work has been thoroughly done I can myself testify, for the excavations made in connection with it have been of the greatest use to me in my examination of this area. It is probably no exaggeration to say that some hundreds of thousands of pounds have been spent directly or indirectly in connection with this prospecting without any profitable result, and the knowledge of this circumstance naturally led me in working over the district to endeavour to avoid overlooking any evidence in favour of the view referred to. Such evidence was consequently fully considered in arriving at the conclusions given in my recent papers.

In supporting the view alluded to, Mr. Horwood, after referring to the fact that I have drawn attention to the possibility of mistaking the Coronation Shales for the shales of the Hospital Hill Beds, says: "It is only necessary to assume that the same mistake has been made by the Survey in mapping the contorted bed on the southern side of the Bezuidenhout Valley as Hospital Hill Shale instead of Coronation Shale, and the whole geology of the Lower Witwatersrand system in this district becomes enormously simplified." But something more than assumption is necessary in a matter of so much importance. The assumption requires to be in accordance with the evidence available. And since the view referred to has already been brought forward so many times, and has enjoyed such exceptional opportunities of verification without favourable result, it is the more necessary that Mr. Horwood's renewed advocacy should be based on something more than assumption. As Mr. Horwood points out, I have myself drawn attention to the possibility of mistaking the Coronation for the Hospital Hill Shale. Most observers well acquainted with these two rocks, however, would I think agree that while such a mistake might easily be made where the outcrops were limited or unsatisfactory, it would not be likely to occur where satisfactory exposures are available. Further, while the Coronation Shale might be mistaken for a poor outcrop of the Hospital Hill Shale, the possibility of the converse error of taking really representative and extensive exposures of the contorted bed for the Coronation Shale ought to be very remote, and in the case of the Bezuidenhout Valley, both at Kensington and at Rietfontein, we have fortunately, most excellent exposures available. In referring to the possibility of confusion in this connection, I have been at some pains to point out (in my second paper, p. 107) that there is very little resemblance between the quartzites which lie above the Hospital Hill Shale and the Coronation Shale respectively, and that the small quartzite which may occur below the latter bears only a superficial resemblance to the true speckled bed. Perhaps no three horizons in the Lower Witwatersrand sequence have such strong and persistent individual characters as the Lowest Hospital Hill Quartzite, the Contorted Bed, and the Speckled Bed, and their value for purposes of correlation has long been recognised. Any one of them can be identified with considerable certainty in good exposures, and when typical exposures of *all three* occur *in their proper sequence and relationships* as they do both at Kensington and Rietfontein sections they afford a basis for correlation which can only be rejected on very much weightier grounds than any that have come under my notice, and I imagine that the great majority of observers who compare the beds in question with undisputed examples of the Hospital Hill and Coronation Beds respectively will have no difficuly in accepting a correlation with the former. Mr. Horwood is apparently under the impression that the whole of my correlations in the Bezuidenhout Valley and Rietfontein areas hinge on the identification of the Contorted Bed. This, however, is far from being the case. They depend upon detailed comparisons, not only of individual bands of quartzite or shale, about which there is often room for doubt in any particular exposure, but also of the series as a whole, and upon the following of doubtful horizons into areas where they become recognisable with more certainty. If Mr. Horwood would support his views by a reasoned correlation, not only of the Coronation Shale in its most limited form, but of the other portions of the same shale body and of the whole series of quartzites above and below it would materially assist any one attempting to examine his evidence. Mr. Horwood claims that by the reverse correlation the geology of the district is "enormously simplified." On the contrary, any one who attempts to go further than to take a very general and cursory view of this area will find that by such a correlation the difficulties to be overcome are indeed very greatly increased. It would be an easy matter to give a long list of the troubles arising from the correlation referred to, and the interpretation of the local structure based upon it now advocated by Mr. Horwood. A sufficiency of these will, however be found to be attached to any attempt to construct a section north and south across Rietfontein in accordance with the view advocated by Mr. Horwood, that this series is a portion of the Lower Witwatersrand system and conformable with the beds in the big ridge to the south. If Mr. Horwood will do this, I am sure his section will be of very considerable interest and service, and will do more to make clear the view he advocates than any written explanation. In order to follow a line easily identified, I suggest that the section should pass approximately from Rietfontein No. 3 Shaft to the south-west corner of Rietfontein "A" ground, and continue approximately on this line as far as the big quartzite to the south (lowest Hospital Hill Quartzite of my map). As there is no difficulty about keeping the same horizon along this quartzite, and the outcrops south of the point so reached are not very good, I suggest that here an offset be made to the west along the big quartzite, and the section then continued across the Government Reef Series along the line of the big prospecting trench referred to in my second paper[1] to, say, the Main Reef at the Glencairn Mine. There will be the less difficulty about making this offset west, as Mr. Horwood strongly advocates the conformity of the whole succession concerned and instances that the Rietfontein Series in the mine shows an extraordinary agreement in strike with the quartzites and shales to the south, a point, however, on which I am of a different opinion.

The Rietfontein area is chosen for such a section because it is the one in connection with which the whole question of the conformity of the Rietfontein series arises, and is also perhaps the one with which Mr. Horwood is most closely acquainted. The line of section indicated is selected because along it, we have available very complete data either from the mine or from the surface outcrops, and it is also one with which Mr. Horwood states that he is familiar, both below and above ground, and hence the construction of a section on his view of a comformable succession should not be a difficult matter. While not suggesting that such a section should be drawn in so much detail as to render its construction laborious, I certainly think it should be made at least approximately to scale, and that the dips shown should be the natural ones, as only in this way can such a section be made of any real service. As nearly as possible along the line indicated above, certain conditions, about which there can be no question, are met with, which should be taken into consideration, and reconciled in some way in the section. Among these, special mention may be made of the following, which are in all cases not merely local accidents, but of far-reaching effect:—The dip of all beds indicated on my map (Pl. xvi.) as Government Reef Series and Hospital Hill Quartzites is either approximately vertical, or overtilted, and a similar dip is shown by the beds to the north, as far as the granite indicated in my plan, except that in some cases these latter appear to be still more overtilted, and have a distinct dip to the north. On the other hand



Map of the Lower Witwatersrand System on the Central Rand.

the Rietfontein Series, both at the surface, and in the mine, have a low general dip of about 20 deg., which becomes still less in depth, the beds, as they are followed on the dip, flattening and finally dipping northwards. Between these two groups of strata there is evidence of the presence of a large mass of granite, as shown in the map referred to, and in Fig. 2a in my recent paper. Mr. Horwood considers that "there is no surface evidence to warrant this being done," but, as shown below, the evidence of the presence of the granite, underground at least, is indisputable; and it cannot therefore be ignored in any section across this area. The section might also show the beds supposed to underlie the Rietfontein series, and which on Mr. Horwood's view would embrace all those from the Hospital Hill Quartzites to the Orange Grove Quartzites inclusive. In this way some estimate of the probable total thickness of the Lower Witwatersrand system in this area might be arrived at. If the Rietfontein series is conformable with, and forms part of the Lower Witwatersrand system, and there is no very serious faulting to be considered, as maintained by Mr. Horwood, the construction of such a section as I have indicated should be a simple matter; and if the conditions above referred to (which are only a few among many still less easy of explanation to be seen in the Bezuidenhout Valley) can be reconciled in accordance with Mr. Horwood's views, the grounds for accepting these latter will be very greatly strengthened. While, however, it will be clear to anyone reading the brief description of the Rietfontein series given in my first paper[2] that I am fully of opinion that there is still much to be learnt about it, there is one point at least on which all the available evidence is very strong, and that is that the Rietfontein series is not interbedded in the Lower Witwatersrand system. In connection with that part of the section near Rietfontein, which I have mapped as Government Reef Series, there occur at their proper horizon what most observers would probably regard as typical examples of the Coronation Shale and Government Reef[3], the characteristics of the former indeed being so well represented near the Barrett's Rietfontein road, that this was specially recommended as a typical section[4]. It would be interesting if Mr. Horwood would say with what horizons, in the Florida or Witpoortje sections, he would correlate these two, and how he would explain their extraordinary similarity to the Government Reef and Coronation Shale horizons, respectively, as developed in other localities where their identity is certain, and where also their associations are closely similar.

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[1] Trans. Geol. Soc. S.A., vol. xiv., p. 113.
[2] Trans. Geol. Soc. S.A., vol. xiv., p. 39.
[3] Trans. Geol. Soc. S.A., vol. xiv., p. 114.
[4] Ibid. Appendix II., p. 130.

Springs Mines Shaft-Sinking.

The shafts were sunk a further 1,644 feet during the twelve months, of which 989 feet were accomplished in the north shaft and 655 feet in the south shaft. Anticipations in regard to increased footage and reduced costs were unfortunately not realised as, owing to the large quantity of water still being encountered, it was found necessary to excavate pump stations and large sumps below the dolomite formation in both shafts. This naturally retarded sinking operations, and as a consequence, normal conditions were not realised in the north shaft until November last, and have still to be reached in the south shaft. Conditions in both shafts are now, however, such that provided no unforeseen difficulties arise, the reef should be intersected in the north shaft towards the end of the year, and in the south shaft during the early part of 1913. The total depth of the north shaft at December 31 was 1,572 feet, costing £57 10s. 4d. per foot, and of the south shaft 1,301 feet, costing £65 18s. 4d. per foot, giving an average cost of £61 6s. 5d. per foot. During the year the directors entered into an agreement with the Rand Water Board to sell to the Board all surplus water from the shafts which formerly ran to waste, at the price of 3d. per 1,000 gallons. Pumping commenced on December 15, and from that date to the end of the year 13,450,000 gallons passed through the Rand Water Board's meter, and the company's finances benefited thereby to the extent of £168 2s. 6d. The cash receipts and expenditure to the end of the financial year were as follows:—Receipts—Working capital, 330,000 shares at 30s., £495,000; interest and sundry revenue, £33,269 3s. 3d.; total, £528,269 3s. 3d. Expenditure—Transfer duty, etc., £9,776 6s. 8d.; shaft sinking and equipment, £297,625 11s.; general expenses, £22,090 10s. 6d.; balance, being cash and cash assets, after deducting liabilities, £198,776 15s. 1d.

Rhodesian Section.

LATEST MINING NEWS.

Affairs of the Cam and Motor Company—A Strong Position and a Commendable Policy—The Surprise Mine and its Misfortunes—Tributors' Operations at the Selukwe—The Redrup's Kop Equipment—Antelope Developments—Somabula Diamonds—The Shamva's Ore Reserves—Copper Smelting in Katanga.

Three years ago the Cam and Motor mines on the Eiffel Flats were in the possession of small workers, practical men who had to strive and struggle with propositions which they soon realised were far too large for comparatively slender pockets. Towards the end of 1909 the London and Rhodesian Mining Land Company acquired the properties of the Good Shepherd Syndicate and the Brothers Campion. Flotation of the Cam and Motor Mines resulted about a year later, and there can be no question as to the magnitude of the debt which Rhodesian mining owes to those who first exploited these properties. For the Cam and Motor has proved itself to have all the makings of a really vastly important mine, and during the depression of the past few months the continued excellence of development in this Gatooma proposition has undoubtedly exercised a beneficial and steadying influence on the industry generally. It is now stated that there are "in sight" in the property well over a million tons of ore of a value of 52 shillings per ton. It would be well to have more definite particulars of what development has actually been carried out before accepting this statement, but it is clear from recent reports that the tonnage developed to-day is largely in excess of that blocked out at the end of September, viz.: 700,000 tons of a value of 47s. 2d. per ton. Meanwhile preparations are being made for the erection of a large reduction and treatment equipment. It has all along been recognised that minor difficulties would very probably be encountered in the treatment of the ore, and the directors have pursued as cautious and commendable a policy in this respect as in regard to development. An experimental plant has been at work for some time past, and it is understood that this has already indicated an efficient and profitable method of treatment. Taken on the whole the management of the Cam and Motor may be said to afford an admirable example of what Rhodesian management should be. The mine is in an exceptionally strong position as regards the ore reserve. Moreover, the nature of the ore will, it appears, be thoroughly understood before any attempt is made to proceed with the erection of permanent plant, and as all the world knows, it has been a not uncommon fault in Rhodesia to proceed with the premature erection of crushing plant.

The Cam Mine Prior to Flotation.

It is stated in London that the cost of the Cam and Motor plant will be in the neighbourhood of £80,000. We personally should have imagined that a substantially larger expenditure would be anticipated, but taking it at this figure a few words as to the financial position of the company should be of value and interest. Since the balance sheet of the company dated June 30, 1911, the final call of 10s. per share has brought in some £112,500, and the cash in hand at June 30 make the working capital resources at that date in round figures £120,000. It looks, therefore, as if the company had adequate resources to continue developments to the middle of this year and cash in hand wherewith to pay for the equipment which it is proposed to erect without necessity to issue any of the 50,000 reserve shares.

* * * *

A report has been issued by the London Board of the ill-fated Surprise G.M. Company stating that in consequence of the failure to strike the Surprise Reef in the cross-cut from the north-east shaft at the 630ft. level, the consulting engineer and mine manager have advised that exploratory work should be discontinued. The shareholders have been fully informed, from time to time, as to the nature of the exploratory work which it was recommended should be undertaken to prove the extent and value of the reef, which was struck some two years ago, below the faulted area. No less than 2,700 ft. have been cut in this section. The results of this work have been discouraging. It was pointed out at the last general meeting that the whole future of the property depended upon the cutting of the reef at the 630ft. level in the cross-cut from the north-east shaft. This hope has been disappointed, and as we recently announced the property is to be worked on a tributing basis. The circular remarks that "although the fissure undoubtedly continues in depth it appears that its course and its infilling of ore matter are so erratic that it is now considered problematical whether it will even pay to follow, it being probable that the the ore is to be found only in isolated lenzes of unknown size and at intervals only to be ascertained by an excessive amount of dead work."

* * * *

A circular has been issued to the shareholders in the Selukwe G.M. Co. stating that under the tributing agreement 50ft. of bona-fide new development work has to be completed monthly to the satisfaction of the company's engineer, and the company has also the right, under stipulated conditions, to terminate the agreement. The tributing lease was signed on October 19, and shareholders were informed through the Press. A report by Mr. A. H. Ackermann on the tributors' operations states that on the 6th level main reef drive from the main shaft a spur reef going off into the footwall was found. About 15ft. of driving has been undertaken, the highest panning obtained being 5 dwts., the majority of samples panning traces. This new discovery was opened up on the 7th level; for the first 10ft. it panned 7 dwts. over 18 to 24 ins., the recent samples taken showing only traces. It may, therefore, be said that this development has met with negative results.

* * * *

The plant at the Redrup's Kop mine, in the Bulawayo District, is well on the way to completion. It consists of five stamps, and a five-foot Chilian mill. The mill is erected adjacent to the mouth of the adit, and being high up on the hill, the pulp from the Chilian mill gravitates direct to the slimes plant, which will be installed slightly below the battery. Mr. H. T. Brett is the consulting metallurgist of the concern. Operations will be on a fairly large scale, and as one of the leading consulting engineers in the country made the " reduced value " of the ore bodies about 5 dwts. over 9ft., there is reason to look for a prosperous future for this mine. For a " small " property the ore reserves are large—30,000 tons—while the situation of the property and the manner in which it is laid out lead to the expectation of low working costs. The mine is said to be looking well at the lowest point reached.

* * * *

The Antelope G.M. Co. has issued a statement of developments to December 31, 1911. Changes have taken place on the board, Messrs. R. G. Fricker and A. McLennan having, on nomination of the Gold Fields Rhodesian Development, been appointed directors. Mr. Fricker is chairman. Of the three parallel ore bodies, the chief interest attaches to the showings of the main reef indicated below:—

Level.	Length of Pay Ore. Feet.	Average Assay. Dwts.	Width. Inches.
1	660	9	36
2	300	11	36
3	420	6¾	55
4	350	12½	57
5	340	9½	40
6	435	12	58
7	370	12½	61
8	237	14	55

It is set out that " work is still in progress at these levels." The ore reserves at December 31 are returned at 115,000 tons, with an average of 10 dwts. Estimates of a reduction plant with capacity of 4,000 tons a month have been prepared, and a decision will be taken as soon as the consulting engineer and consulting metallurgist meet in conference with Mr. Piper and advise the board.

* * * *

The Somabula Diamond diggings have for long been idle, but it is now stated in Bulawayo that they are likely to witness a recrudescence of activity as several experienced diggers from the Vaal River have announced their intention of trying their luck there in the course of the next few weeks. Mooifontein's misfortune may be Gwelo's gain.

* * * *

The railway to the Shamva is being pushed on, and it is said that the mine will be in direct communication with Salisbury by October next. The report of the company for the quarter ended 31st December gives the following details of developments at the mine:—Driven, risen and sunk, 2,003ft.; ore developed during period of report, 253,358 tons; ore in sight at 31st December, 1,808,119 tons. Working expenditure, £6,667; capital expenditure, £2,671; depreciation, £6,253; ore-at-grass account (represented by 6,621 tons of ore broken and dumped from the prospect level and between prospect and No. 1 levels), £578; trial crushings account (amount transferred from machinery and plant account), £56.

* * * *

The Star of the Congo smelters have closed down. It is stated that the Union Miniere are short of coke, and that as soon as they get a further supply the works will start again. It is also rumoured that the English and Belgian technical experts do not agree with the way in which the ore is treated, and that the system worked by the English engineers has not proved a success, and that the Belgian method is to be adopted. However, whatever the reason may be, it appears to be quite true that the smelters are closed down.

Globe and Phoenix.—Dividend Declared.

A Reuter's cable says the Globe and Phoenix Gold Mining Company, Ltd., has declared a final dividend of 2s. per share, making 8s. per annum.

Somabula Diamond Diggings.

We are pleased to hear that the fields on Willoughby's ground are again drawing some attention from the diggers (says the *Times.*) A six and a half carat diamond was discovered last week.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiencesof Readers.

Mr. W. Pott and Rand Auditors.

To the Editor, *South African Mining Journal.*

Sir,—I understand a note which I wrote ten days ago in reply to your correspondent "Interested" has gone astray, as it has not been published though forwarded to your office a fortnight ago.

I note "Shareholder's" letter of 23rd, which demands a reply. First let me repeat what I mentioned in my first letter that the newspaper reports slightly altered my words reading "The auditors of the company" instead of "auditors of companies." My remarks were general, as the later context clearly proved. The auditors of the company knew this, as I had discussed the general principles I advocate with them, and they were aware I was not in any way attacking them. I have discussed the matter with many leading auditors since the meeting, and I find many are in agreement with several of my points, but apparently the best way of attaining my object is the system adopted in America after the insurance companies' scandals, when Government appointed independent inspectors outside both directors and shareholders who have great latitude as to investigations and reports. I have not yet got particulars of how these inspectors' duties are laid down, and to whom and when they report, but I am promised this information, and on receipt of same I will deal further with this point. Anyone who heard my remarks would recognise that my point was to strengthen the position of auditors, not to criticise their actions under existing conditions.—Yours, etc.,

WM. POTT.

Johannesburg, March 23, 1912.

[The letter in question was duly forwarded by us to our correspondent.—Ed.]

Ore Divining.

A ROYAL ROAD TO FORTUNE!

To the Editor, *South African Mining Journal.*

Sir,—It may not be generally known, but it is nevertheless an established fact, that there exists between our atmosphere and the different mineral formations (magnetic minerals), as well as between the different formations themselves, a connection which can only be broken by some outside influence, such as is recognised in the case of "wireless telegraphy," when some magnetic formation exists between any two stations. Applying the laws which govern wireless telegraphy, telephony, or any other electric or magnetic appliances, it is an easy matter to locate any mineral formation existing under the earth's surface. By using a very simple appliance it is possible to intercept the waves of magnetism flowing from one formation to another, and at the same time to ascertain in which direction they are flowing, or, in other words, not only to locate the existence of mineral formations, but also to follow their trend or direction. I have made a study of water divining for many years, and have also made a study of mineral finding from a purely scientific point of view, and have now perfected an instrument which we will call ex-polariser, which I maintain will enable me to accurately locate all mineral formations. I shall be pleased to enter into correspondence with any mining men on this subject, it will save all the costly weary months and years now occupied in prospecting for minerals in districts where they do not exist, and will help to develop other districts which to-day are thought to be barren. Trusting that you will find space in your valuable paper for inserting the above, and thanking you in anticipation, I remain, yours, etc.,

A. P. HESUME.

136, Smith Street, Durban,
19th March, 1912.

Lack of Promotion on the Mines.

To the Editor, *South African Mining Journal.*

Sir,—What has become of all the School of Mines graduates, who were, on the recommendations of the Institution of Mining and Metallurgy and other important bodies, scattered along the reef and given subordinate staff billets, which they were assured would speedily lead to better things if they showed industry and aptitude? Is there any truth in a statement which has been oft repeated to me that these graduates found life on and in the mines well-nigh unbearable, that their prospects of early promotion were exceedingly small, and that the majority of them have sickened of Rand mining and hied themselves to Rhodesia, the outlying districts, or other continents? I have no doubt that some of these young men were not all that might be desired, but I am informed by reliable authorities that quite 90 per cent. of them were most valuable industrial assets, and that the Rand is much poorer by their migration to pastures new. All they required was a little encouragement, and in the perpetual rush and hurry, changing of management, and changing of staff, which is the curse of the Rand, no one appears to have been able to give them a helping hand or drop a few hopeful words. Apart from the perilous life which underground workmen live on these fields—I am glad to learn that matters are being remedied—promotion, save to the favoured ones, is painfully slow. A man who has passed all his School of Mines exams. and has acquired a sound practical knowledge is not content to spend the best years of his life cutting samples. It has been rightly pointed out that the Rand is driving away its best miners. But what about the staff? It is all very well to retort that the sampler carries the post-dated cheque of a manager in his sample bags. The trouble is that the tellers of the industry are not very willing ever to honour these cheques unless there is some other recommendation than a good record and an honest striving to get on in the testimonials of their petitioners.—I am, etc.,

A SCHOOL OF MINES MAN.

Is Native Labour Efficiently Handled?

ANOTHER ASPECT OF THE NATIVE LABOUR PROBLEM.

To the Editor, *South African Mining Journal.*

Sir,—In every one of the annual company reports which have appeared for some time past, and in every speech from the chair at company meetings, the dearth of native labour and the disadvantages resulting from it have been prominently alluded to. There seems little doubt that this kind of thing is likely to go on *ad libitum*, and the danger is that boards of directors and mine managers may come to rely upon the labour trouble, in whatever degree it may exist, as a safe means of excuse for errors of judgment and bad management generally. It is not unlikely that the scarcity of native labour has already been brought forward in more than one instance as an apology for high working costs and low profits which were really more dependent upon other circumstances. I venture to suggest that before the plea becomes altogether threadbare some effort should be made to investigate the problem of native efficiency, such as it is, in some systematic and scientific manner, in order to see whether mine managers are really justified in their complaints. A leading engineer of the Rand, who has a great deal to do with the practical aspect of the native labour question, is of opinion that the trouble lies more often in the fact that the aborigine is not properly utilised rather than that he fails to come to work in sufficient numbers. If this be so, a committee of enquiry would probably serve a useful purpose. We have had drill steel investigations, explosives investigations, and the rest; why not one into the matter of the most effective method of employing Kaffirs? It is difficult to explain the whole scope of such an enquiry in a few words, but, to put it as concisely as possible, it would consist in finding out how far the views of the engineer above mentioned are correct or otherwise.—I am, etc.,

SHAREHOLDER.

PROGRESS AT THE MODDERFONTEIN DEEP LEVELS.

Rapid Shaft Sinking—Reef may be Struck in June.

The revenue and expenditure account of the Modder Deep Levels for 1911 shows:—Interest received, £5,031; rents received, £489; interest received on shares held in the Rand Mutual Assurance Co., Ltd., £16; total, £5,536; from which has to be deducted the following expenditure, viz.: Administration and other expenses, £5,040; contribution to capital cost and upkeep of Transvaal Miners' Phthisis Sanatorium, £46; donations to charitable objects, £93; total, £5,179; leaving a credit balance of £357, which has been carried to the balance sheet. The expenditure on capital account during the year amounted to £100,922 6s. 5d. No 1 Shaft was sunk 1,718 feet, to a depth of 1,949 feet, No. 2 Shaft was sunk 1,428 feet to a depth of 1,622 feet, and the two shafts were connected by means of cross-cuts at points 700 feet and 1,400 feet from the surface. The total cost and average per foot of shaft sinking are as follows:—No. 1 Shaft, 1,949 feet, average cost per foot £19 11s. 3d.; No. 2 Shaft, 1,622 feet, average cost per foot £22 4s. 8d.; totals and average, 3,571 feet, total cost per foot £20 15s. 9d; total cost of shaft sinking, £73,239. Rapid progress has been made in the sinking of No. 1 Shaft, where no difficulties with water have been experienced. In the No. 2 Shaft the rate of sinking has also been very satisfactory, though for some months work was retarded by an inflow of water which, after reaching a maximum of about 280,000 gallons per day, has since decreased considerably and is now being handled without difficulty.

CONSULTING ENGINEER'S REPORT.

Mr. W. McC. Cameron, the Consulting Engineer, writes:—The report of your manager gives details of the work done during the year. Sinking has progressed steadily throughout the year in both shafts, No. 1 shaft having reached a depth of 1,949 feet, and No. 2 shaft 1,622 feet. No difficulties other than several hard dykes were encountered in No. 1 shaft, and the average speed of 149.3 feet per month was maintained over the sinking period. A considerable flow of water was met in No. 2 shaft at about 1,300 feet, which retarded the work and caused much delay. The water bearing fault passed out of the shaft at 1,400 feet, where the water was caught up, and there is no reason for anticipating further trouble. The cost of sinking has averaged for the year for the 3,146 feet sunk in the two shafts £20 5s. 6d per foot, and the total of 3,571 feet sunk to date £20 15s. 9d. per foot. The good rate of advance maintained and the low cost per foot sunk reflects credit on your manager and staff. Several reef bands in the Kimberley series and other reef bands below this series were cut in the shafts, none of which, as was anticipated, shewed values of any importance. As I stated in my report for last year it is estimated that the reef will be cut at a depth of about 2,750 feet, and as it has been possible to sink at a greater speed than was anticipated a year ago. the reef will probably be intersected in No. 1 shaft about June, 1912. The two shafts were connected by cross-cuts at 700 feet and 1,400 feet. At the first a temporary pumping plant was installed and at the second the upper unit of the permanent pumping plant is being put in. These connections have assisted greatly the ventilation of the shafts and the rate of sinking. The remainder of surface plant for sinking and development stage was completed early in the year with exception of additional single quarters yet required and probable increase in air compressing plant.

MANAGER'S REPORT

Mr. J. P. Hussey, the Manager, writes, *inter alia*:—During 1911 there were erected: A compressor house, an engine house at No. 1 shaft, three small transformer houses in connection with the lighting circuits, a temporary change house for white and one for native employees, two timbermens' and pumpmens' huts near the shaft collars for the use of the men and the storing of tools and pump spares used underground, as well as a timber shed near the shops for the protection of framed timber, guide ropes, etc. A flush water drain and an extra set of cooking pots were added to the compound. All the necessary latrines for whites and natives were completed in the beginning of the year. A double row of trees were planted on the north side of the married and single quarters as a protection against wind and dust. Machinery and Plant—The work of erecting the 35 drill compressor was completed in February and the two permanent steel headgears with waste bins in March. The temporary headgears were removed when the steel frames were raised. The permanent winder at No. 1 shaft was completed and and used in May. The work of erecting the three boilers, delivered at the end of 1910, was completed and all necessary connections made early in the year. Five skips were built to replace the cages used with the temporary headgears. In order to use the mine water for boiler feed, two tanks were erected between Nos. 1 and 2 shafts and a boiler to heat the water, by means of exhaust steam, was erected behind No. 2 winder. A tank, for the supply of mine water for fire service, etc., was placed in No. 1 headgear, and a 4-in. pipe service connects same with all buildings on the property. By the time the Victoria Falls and Transvaal Power Company was ready to supply power to the mine, in March, the two workshop motors and three lighting transformers were erected, and all necessary wiring completed. An electric pump, with the necessary cable, column, etc., was installed at 700 feet cross-cut between Nos. 1 and 2 shafts. Track for the transportation of timber, pumps and tools from the workshops to the shafts and for depositing rock on the dump, was laid. Shaft Sinking:—No. 1 Shaft—Two weeks of sinking were lost in this shaft while erecting the steel headgears. For the eleven and one-half months worked 1,718 feet were sunk, giving an average for the year of 149.3 feet per month and a total depth of 1,949 feet on the 31st of December, 1911. It is expected that this rate will be maintained. Further reef bands of the Kimberley series were encountered and sampled. The highest values obtained were: One of 1.5 dwts. over 42 inches at a depth of 230 feet 11 inches, and one of 2 dwts. over 31 inches at a depth of 281 feet 10 inches. All other bands show less than 1 dwt. and mostly only traces. No. 2 Shaft.—The depth of this shaft on the 31st December was 1,622 feet, or 1,428 feet sunk during the eleven and one-half months worked—two weeks being lost during the time the permanent headgear was being erected—giving an average of 124.1 feet per month. A heavy flow of water was encountered in this shaft in August, which interfered to a large extent with the speed of sinking. This water was passed through and caught up at 1,400 feet, and sinking is progressing at a normal rate now. Only two additional bands of the Kimberley Reef series, cut during the year. show values over 1 dwt.; one of these at a depth of 307 feet 10 inches gave a value of 2 dwts. over 16 inches, the other, encountered at 516 feet, gave 2.5 dwts. over 6 inches. The amount of water raised per day varied considerably during the year, having increased to 283,000 gallons per day and then decreased to 106,000 gallons per day in December. Cross-cuts—The shafts were connected up with two cross-cuts: One at 700 feet and one at 1,400 feet. A small chamber with sump was cut at 700 foot cross-cut, to receive the small electric three-throw pump, and a large chamber with sump nearly completed at the 1,400 foot cross-cut, to provide for two large electric pumps forming one unit of the permanent pumping plant. Kimberley Reef Prospect:—During the time occupied in the erection of the present headgears, the surplus labour was employed in prospecting the outcrop of the Kimberley Reef Series, but no encouraging values were disclosed.

Mr. E. Weinberger, Chief Engineer and Manager of the new permanent South African branch of the firm of Messrs. Adolf Bleichert & Co., has arrived on the Rand, where he will make his headquarters. He has taken offices at Consolidated Buildings. Mr. Weinberger was formerly one of the leading engineers on the staff of his firm, and is an expert in all matters connected with aerial ropeways and telphers.

THE MACHINERY MANUFACTURERS' 1911 HARVEST.

Huge Sums Spent by Rand Mines Last Year—Further Large Disbursements Necessary.

A very little perusal of annual reports suffices to establish the fact that last year manufacturers of mining machinery reaped a rich harvest from the Witwatersrand gold fields. Moreover, it is evident that there still remain considerable sums to be expended on the completion of equipment on the producing mines—this quite apart, it should be observed, from propositions which have yet to erect reduction and treatment equipments and the thousand and one items of mechanical and electrical equipment which have of necessity to be purchased before a large mine can attain to the producing stage. Manufacturers of mining equipment are not, we venture to think, fully alive as yet to the vast changes that have overcome the Rand during the last year or two. These changes have been so great that they might truthfully be stated to constitute a revolution. All along the reef one sees old equipment being displaced by new. Even on the older outcrop mines the electrification of the industry, the tremendous advances recorded in metallurgy and the ever insistent need for more labour-saving appliances in the face of the continued shortage of unskilled manual labour, demands almost continual renewals and additions. Amalgamations of mines with a consequent prolongation of productive operations has justified boards of management in re-organising equipments and installing the very latest and best machinery. Even the best machine wears out sooner or later, at any rate the day comes when engineers and metallurgists recognise that the equipment of years' standing is achieving inefficient work and that it will be in the best interest of the mine or mines to sell or scrap it and purchase new plant. Of course, the life factor has to be an important influence in these considerations, but the tendency of late has been to eliminate the absolute cessation of milling by absorption and amalgamation of units, and thus a very extensive scheme of renewal of installations almost right along the Reef has been thoroughly justified by the general outlook for the industry. Another feature of interest and paramount importance to mining machinery manufacturers and agents has been the striving for better ventilation and the consequent demand for fans of modern and reliable design. As will be seen from a table printed elsewhere in this issue, a globular sum of no less than £14,070,291 was spent by the mines of the Union in 1911 on machinery and stores. Some of the amounts expended by Witwatersrand gold mining companies on new machinery and plant during 1911 are stupendous. The Crown Mines, for example, expended on sundry extensions to machinery plant, and buildings, etc., including the equipment at the No. 5 shaft, just under half a million sterling—to be precise, £497,838. Owing largely to delays experienced in deliveries of material, the progress anticipated early last year in this company's new construction work has not been fully realised. The main works completed, or practically completed, throughout the year were as follows:—New headgear and double stage winding at No. 7 shaft, new crusher station at No. 7 shaft, new 160-stamp mill and subsidiary plants, ventilating fan, sands filling equipment, 40 new cottages for Boer miners, native married quarters, native change house, and additions to native central hospital. The double stage winding equipment at No. 7 shaft, which was completed about the middle of the year, is working very smoothly, as is also the new crusher station at that shaft. The entire tonnage of ore from the western section is now being hoisted on day shift only, which has very much simplified hoisting arrangements, as well as underground and surface transport. The chief items of construction work yet to be completed are the new crusher station, permanent winding arrangements, shaft equipment and underground pumping plant, all at No. 5 Shaft, the general surface railway system for ore transport, and the extension to Butters' Plant. The construction programme should be finished soon after the middle of this year.

At the Village Deep we find that £53,847 was expended on equipment last year. Manufacturers of machinery will be interested in learning that £21,236 was spent on electrification of plant, £4,547 on the reduction plant, £9,581 on general underground equipment, and £1,555 on an air testing plant. Both the Rose Deep and the Geldenhuis Deep spent large sums on capital account, and a host of new purchases, additions, and renewals, etc., figure in their schedules. Electrification of equipment cost the Rose Deep nearly £30,000, and the Geldenhuis Deep £37,336. On an electric tramway between the sectional crusher stations the latter company spent £13,864, and the Rose Deep paid £5,675 in respect of a tram-line between the Rose and Glen mills. Ventilating fans cost the Rose Deep £2,258, and on underground electric pumps the Geldenhuis Deep spent £3,882. Sand filling plant figures in the Geldenhuis Deep's capital expenditure sheet at £6,879, and in that of the Rose Deep at £6,000. Additions to crusher stations, underground winding engines, and air meter testing plants are amongst a few other items totalling up several thousands more. At the Durban Roodepoort Deep £32,401 was expended on electrification of plant. The Robinson spent the following amounts:—Tailings haulage, £1,011; plant electrification, £5,812; sand filling plant, £5,174; Butters filter plant, £31,240; ventilating fan, £1,603; native change house, £1,098; air meter house and station, £173; air meter tests and testing station (this company's proportion), £518; making a total of £46,631.

Turning for a moment to the expenditures on machinery and plant incurred by other groups during the year, it may be remarked that the Witwatersrand Deep paid £17,229 for new machinery. The West Rand Consolidated's capital account came to £89,520, of which £58,826 was on machinery and plant. The Meyer and Charlton expended under this heading £54,802, and the Rand collieries £57,186. The Cinderella Consolidated's machinery and plant account for the year stands at close on £40,000. Here the No. 1 hauling engine, which had for some time given considerable trouble, was replaced during the year by a 5-ton electric hoist, which was brought into use at the beginning of July and has since been working satisfactorily. A new 12½-cwt. steam hammer and a Landis bolt-screwing machine have been added to the workshops plant. Two Spitzkastens have been erected at the cyanide works. The erection of the pumping machinery at the new dam was completed and the pumps started up in April. A new sample crusher and a " Rival " assay furnace were erected at the assay office. An electric pump and necessary driving gear were installed at the 4th Level of the Incline shaft—Cinderella Section. A 6-cell transformer house with control house was completed and equipped during the year.

We might continue the list until several pages of this journal had been filled with items of expenditure incurred last year by Rand gold mines in connection with equipment. Sufficient, however, has been said to prove that the Main Reef series affords as good a market for mining machinery manufacturers as ever. In fact, with new schemes of underground exploitation under consideration, the continued advance of metallurgical science and practice, and the ever-present necessity for the employment of more and more labour-saving appliances becoming more and more insistent, the outlook for an even larger volume of business this year than in 1911 seems a reasonable expectation.

Mr. R. A. Alston, formerly manager of the Glencairn, has been appointed manager of the Vogelstruis Estate Mine.

* * * *

Mr. J. H. Ronaldson, who has been advising on the Beatrice Mine, of the General Mining and Finance group in Rhodesia, returns to the Rand this week.

THE WEEK IN THE SHAREMARKET.

Steady, Without Much Business—New Stocks Listed—The Outlook—Diamonds and Tins Looking Up.

DESPITE selling from Paris towards the end of the week, the market has kept wonderfully steady. Little business, of course, is being done, but it is hoped that the approaching cessation of the strike, and the improving labour position, will make for activity. Against this, however, must be set the possibility of the Phthisis Compensation Bill being regarded as a blow to the industry, and making at first for depressed markets. When the fact is realised, however, that by strenuous co-operation between State, mines and men, the evil can be stamped out in a few years —indeed is already diminishing—anxiety will be allayed. Bear rumours continue to agitate holders, and the bigger the property, apparently the more it is made the butt of the sensation monger. Tins have been firmer on the Leeuwpoort flotation, and the news from all Waterberg properties is encouraging. Diamonds too, are brightening up, and from Eland, Blaauwbosch, Frank Smith's, and Ebenezer good reports are expected when the new gears are at work.

	* Friday, 22nd.	* Sat., 23rd.	* Monday, 25th.	* Tuesday, 26th.	Wed., 27th.	Thurs. 28th.
African Farms ...	16 9	16 9B	16 9B	17 6	17 3B	17 9
Adair-Usher Process	1 2B	1 0B	...	...	...	...
Aurora West ...	7 6B	8 0B	7 6B	7 6B	8 3B	9 6B
Apex Mines ...	35 0S	...	35 6	37 6B	37 6B	...
Bantjes Consolidated	23 9B	24 0S	24 6	24 9	24 9B	25 0
Benonis	5 9B	5 9B	5 8B	5 9B	...	5 9B
Blaauwbosch ...	...	...	...	...	5 9B	...
Bushveld Tins ...	1 0S	0 10	0 9	0 9B	0 9B	0 9B
Brakpan Mines ...	57 0B	58 0B	58 0B	58 0B	59 0B	59 6B
British S A. ...	28 0B	...	...	29 6B	29 6B	30 0B
City and Suburban ...	48 6	48 0B	49 0	49 3B	49 3B	49 3B
City Deeps	52 6B	52 6B	53 0	53 6	54 0S	54 0B
Cloverfield Mines ...	5 3	5 3	5 3B	...	5 3B	5 4B
Cons. Langlaagtes ...	21 0B	21 0S	21 0	21 0	21 3B	21 3B
Cons. Main Reefs ...	18 0	18 0B	18 3	18 3S	18 6B	19 0
Clydesdales	10 0B	10 0S	10 0B	10 0B	...	...
Cinderella Cons. ...	...	...	...	...	...	20 0B
Coronation Freeholds	0 7B	...	0 6B	...	0 7B	0 6B
Con. Investment ...	22 6B	22 0B	...	...	23 0S	...
Concrete Cons. ...	10 0B	10 0B	10 0B	11 0B	11 0B	11 0B
Crown Diamonds ...	5 0B	...	...	...	...	...
East Rand Cent. ...	8 0B	8 0B	8 0B	8 0B	8 0B	8 0B
East Rand Coals ...	2 5S	2 5B	2 5B	2 5B	2 5B	2 5B
East Rand Deeps ...	2 2	...	2 2B	2 2B	2 5	2 2S
East Rand Props. ...	59 0B	59 6	59 6	60 0S	59 0B	59 6
East Rand Deb. ...	...	£93	£95	...	£93	£90
Eastern Gold Mines	2 0B	2 0B	2 0B	1 10B	1 10B	1 10B
Govt. Areas... ...	23 3B	23 0B	23 6S	24 3	24 6	24 6
Glencoe (Natal) Colls.	6 5B	6 5B	6 5B	6 5B	6 5B	...
Glynn's Lydenburgs	33 0S	30 0B	30 0B	...	...	31 0B
Glencairns	5 0S	5 0S	5 0S	...	5 0S	5 0S
General Minings ...	24 0B	23 0S	19 6B	...	...	...
Ginsbergs	28 0B	30 0S	...	...	...	...
Geduld Props. ...	21 0B	...	...	21 6B	...	...
Geldenhuis Deeps ...	...	...	37 6B	...	...	...
Jumpers	9 0B	9 0B	9 0B	...	...	...
Jupiters	10 9B	10 6B	10 6B	...	10 9B	10 9B
Kaalfontein Diamonds	0 7B	0 9S	0 6B	...	...	0 9S
Klerksdorp Props. ...	3 3B	3 3B	3 3B	3 6	3 9	3 9S
Knight Central ...	15 0B	14 6	14 0B	14 3B	14 7B	14 6B
Kleinfontein Estates	32 6S	32 6S	...	...	...	...
Lace Props.	3 3B	3 3	3 3	3 5	3 6B	3 3B
Lydenburg Gold Farms	8 7B	8 6B	8 6B	8 6B	8 6B	8 7B
Main Reef Wests ...	...	28 3B	28 0B	28 6B	28 0B	28 0B
M.R. West Deben...	£100½	£100½	£100½	...	£101	£100½
Modder B's	52 9B	53 0B	53 0B	53 0B	53 6B	54 0B
Midas Deeps ...	...	1 2B	1 2B	1 2B	1 2B	1 2B
Middelvlei Estates...	2 0B	2 0	2 0B	2 0B	2 0B	2 0B
Modder Deeps ...	24 0B	24 0B	25 0B	...	25 0B	26 0B

B Buyers. S Sellers.

	Friday, 22nd	Sat., 23rd	Monday, 25th.	Tuesday, 26th.	Wed., 27th.	Thurs. 28th.
Meyer and Charltons	...	82 0B	...	...	...	...
Natal Nav. Colls ...	15 9B	15 9B	15 9B	...	15 9B	...
New Eras	6 9	7 2	7 0	6 9B	6 10B	7 0B
New Kleinfonteins ..	29 0B	29 6S	29 6B	29 6B	29 9B	30 3B
New Rietfonteins ...	...	10 9B	10 9B	10 9B	11 6S	11 6S
New Unifieds ...	...	19 0S	18 9S	17 0B	...	...
New Boksburgs ...	1 6S	...	1 8B	...	1 9B	...
Nigels	...	...	...	16 0B	...	...
Orange Diamonds ...	1 9B	1 10B	1 10B	1 9B	1 9B	1 9B
Pretoria Cement Co.	47 6B	49 0B	49 0B	50 0B	...	50 0B
Princess	11 0S	11 0B	12 0S	...	...	...
Premiers Def. 2s. 6d.	...	177 6B	...	...	...	...
Potchefstroom Est....	...	1 6B	...	1 6B	1 6B	1 6B
Paardekraal Estates	...	1 0S	...	...	...	...
Premiers Preferred	...	167 6B	...	...	...	...
Rand Nucleus ...	3 3	3 2B	3 3B	3 2B	3 4	3 3B
Randfontein Estates	34 3B	34 0	34 0B	34 3B	35 0	34 9B
Randfontein Deeps...	3 0B	2 6B	3 6B	...	3 9	4 0S
Rooiberg Minerals ...	28 3B	28 3B	28 6B	29 0	30 6	30 3
Rand Collieries ..	7 9B	7 6B	7 6B	7 9B	7 6B	...
Rand Klip	5 6	5 3	5 3B	5 3B	5 5	5 3B
Ryan Nigels ..	...	4 0B	4 0B	4 0B	4 0B	4 0S
Robinson Deeps ...	...	...	...	...	...	52 6B
Rood. Durban Deeps	25 0B	...	25 0B	21 0S	25 0B	...
Salisburys	2 0B	3 6	...	...	3 6S	3 6S
Simmer Deeps ...	...	4 4B	...	...	...	4 6S
South African Lands	4 9	4 9	4 8B	4 10	4 7B	4 7B
S. Randfontein Deeps	...	4 3B	4 3B	4 4B	4 6B	4 6B
Sub Nigels	7 0	6 0B	6 0S	6 0B	6 3B	6 6B
S. A. Breweries ...	39 0S	39 6B	39 6	39 0B	39 0B	39 0B
Springs Mines ...	11 0B	11 6B	11 6	11 6B	12 0	11 6B
Trans. G.M. Estates	44 0B	44 0B	44 0B	44 0B	...	...
Temple Tins ...	...	...	2 9B	...	3 3S	...
Trans. Coal Trusts...	36 9B	36 6B	37 3B	37 9	33 6	39 0B
Tudors	2 0S	...	...	...	1 0B	...
Trans. Cons. Lands	...	...	30 0B	...	33 0B	...
Van Ryn Deeps ...	7 9S	7 10B	7 10B	8 0B	8 0B	8 0B
Village Deeps ...	40 6B	40 6B	40 6	40 6B	41 3B	41 6B
Voorspoed Diamonds	...	11 0S	...	...	...	10 0B
Vogel. Cons. Deeps...	...	1 9	1 6B	1 6B	1 6B	1 8B
Witwatersrands ...	54 0B	54 0B	56 0B	...	56 0B	57 0B
Wolhuters	22 0B	22 0B	21 9	21 6B	21 9B	21 9B
Witbank Collieries...	42 0S	42 0S	37 6B	...	41 0S	...
Wit. Deeps	51 0B	51 0B	51 0B	52 0B	53 8B	54 6B
Wit Townships ...	21 0B	...	22 0B	22 0S	...	...
West Rand Con. ...	...	10 9B	10 6B	...	...	...
West Rand Est. ...	3 6B	...	3 0B	...	3 0B	...
Zaaiplaats	51 9	49 6	49 0B	48 6B	48 0B	46 6B

B Buyers. S Sellers.

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Electrical Notes.

The New Electricity Rules for British Mines.

We dealt with the amended British Electricity Rules briefly in our last issue; but there are a number of points which considerations of space excluded then and to which we now desire to draw attention. There are certain additional switchgear requirements, for example, the general effect of which is to render compulsory the use of apparatus totally enclosed in iron cases. The requirement that switchgear for cutting off the supply of current to the mine shall be provided within 200 yards of the shaft, has been amended to the extent of deleting the distance limit. An "authorised person" must, however, be "available within easy reach" to operate the switchgear, and there must be facilities, telephonic or otherwise, for communicating with this authorised person from the mine. The rules relating to cables are, conjointly with the earthing regulations, by far the most important of the changes which have been made. The most prominent rules are those which, subject to a few exceptions, render obligatory the use of armoured cables for all underground purposes. Assuming that practically all underground work is at medium pressure or higher, the only places where unarmoured cables can be used are those where there is no risk of igniting gas, coal dust, or other inflammable material, and where there is no mechanical haulage. Regarding portable apparatus, these must henceforth be earthed to the surface of the mine. Since this necessitates the provision of an earth conductor, it will probably prove cheaper in practice to instal armoured cables everywhere. No doubt the rules have been designed with this object in view. It should be noted, however, that the practically (though not necessarily legally) compulsory use of armoured cable ends at the face. "Trailers" are not allowed to be armoured unless the armouring is for mechanical protection. That is to say, the armouring must be used as the earth conductor unless an additional internal earth wire is also provided. Our view of the armouring rules is that they are not justified by past experience, and therefore constitute an entirely unnecessary extra burden on the industry. In the case of large and wealthy concerns the cost of compliance with the armouring and earthing regulations may not be felt to an appreciable extent, but it will be far otherwise with the numerous small properties. The section on "Supervison and Working of Apparatus" involves an important departure from present practice. The electrician becomes, for the first time in the history of mining legislation, a legally constituted and recognised mining official. This section of the rules details his responsibilities. The effect of the change will be to remove from the shoulders of the manager his present responsibility for compliance with every little technical detail. The electrician now becomes responsible for the performance of certain specified statutory obligations, and provided the manager finds the right materials the electrician will be the one who will have to "face the music" if anything goes wrong. Not the least important of his duties will be those which relate to testing and examination of apparatus. This is required to be done "as often as may be necessary to prevent danger," and certain daily log sheets which are required to be kept according to a prescribed form will provide a record of such examinations. The provision as to the examination and testing of all new apparatus, and of all apparatus re-erected in a new position in the mine, is likely to prove troublesome if not unworkable, unless there is a satisfactory understanding as to the interpretation which is to be put upon this rule. The change will entail far more work on the electrician, but on the other hand he now has the opportunity of establishing himself as a highly responsible mine official. It is a great chance for him. Whether he will rise to the occasion promptly, or grope his way to a position which has been made for him before he is ready for it, is a point which we are not at this moment prepared to answer. The voltage on signalling circuits is raised from 15 to 25 volts, and all restrictions as to the places where bare wires may be used for signalling have been removed. It may be presumed that this alteration implies the complete absence of risk from sparks on signalling circuits, in the official view. But while there is an apparent relaxation in this respect, it will be found that the shot-firing regulations now totally prohibit the use of current from lighting or power circuits. Having regard to the fact that accidents from retarded ignition or ineffective explosion of blasting charges in shaft sinkings are of more frequent occurrence than accidents arising out of the use of current from lighting mains; and that, moreover, excellent apparatus is available for the safe application to blasting of such means, the extra precaution may do more harm than good.

The Troubles of Cables.

In the discussion on the paper by Mr. A. E. Gibbs, M.S.A.I. of E.E. (read at the October meeting):

Mr. V. Pickles, Associate Member, said at the last meeting of the S.A.I. of E.E.: "I am glad to note that the question of electrolysis has been raised in this discussion by one or two members. This is a question of great and increasing importance at the present day. In the case of lead covered cables laid in bitumen, Mr. Gibbs tells us that no effort should be made to insulate the lead covering. I know, of course, that it is quite impossilbe to do so, but I nevertheless think that if more conscientious efforts were made to insulate as much as possible we should have far less trouble with cables of this type. Mr. Wilson points out the danger of partially insulated places, and in a carelessly laid solid system these may easily exist, and I have no doubt that tramway companies often receive the blame for troubles which really ought to be laid on the cable contractor, or at least if the contractor had done his work properly, the troubles would not have occurred. I have heard of a solid laid system where the bitumen was mixed with sufficient oil to give it a permanent plastic state, thus avoiding cracks. I cannot vouch for the correctness of this, but if it is possible, it seems to me that it would make a most satisfactory job.

I agree with Mr. Elsdon Dew with regard to keeping a close watch on a cable system in the vicinity of tramways. It is not sufficient to make an initial survey and then leave it, as conditions often vary from time to time. It is often the practice to bond the cables to the track at the negative point, that is, of course, if there is one in the vicinity. Sometimes they are bonded promiscuously to any point. Now in tramway systems with more than one negative feeder, the point of connection of any of them may frequently be of a higher potential than that of the surrounding earth, in which case if we bond we have an obvious source of danger. Some engineers prefer to earth the cables to an ordinary earth plate at frequent intervals. I know a case where a rule was made to earth cables in this way every 200 yards for about a mile on either side of a negative point. Tests were afterwards made in order to get some idea of what real use these earth plates were. About three-quarters of a mile from the negative point, it was found that although the cable there was positive to the track, current flowed from the earth to cables. Near the negative point of course, current flowed from the cable to earth plate, while somewhere between these places was a neutral point where no current flowed. It is obvious that beyond this neutral point the earthing of this cable only tended to raise its potential and was therefore bad. Whether bonding or earthing is resorted to it ought to be done intelligently, and with some sort of knowledge as to what is going to happen, otherwise we may increase instead of decrease the trouble. There seems to be a popular idea that when troubles from electrolysis are experienced, all that is to be done is to lay down an earth plate and connect up the cables to it. Mr. Wilson said that this should be done in the neighbourhood of a negative point. Suppose this were done and the current to be got rid of was, say 3 amps. (I have known a much greater current than this be flowing in the lead of a cable.) Now we can seldom, even under the best of conditions, get an earth plate with a lower resistance to earth than 4 ohms. I mean if a resistance test be made with alternating current, it generally works out at a figure not less than 4 ohms. If therefore the P.D. to earth is 4 volts, we shall get rid of 1 amp., which would leave us still 2 amps. flowing in the cable. I have known tests to be made on a great number of earth plates connected to cables, and have found that about half an amp. is the usual sort of current found to be passing to earth by these. Personally I attach more importance to good laying than anything we can do in the nature of bonding or earthing. Keeping stray currents off the cables is better than doubtful means of taking it off. An earth plate is but a parallel path to bad places, and bonding to track, unless carefully done, might be worse than useless."

"Cascade" Induction Motors.

The "Cascade" Induction Motor, recently introduced by the Sandycroft Foundry Co., Limited, of Chester, marks a distinct advance in the application of electricity to the working of mines. It is claimed that this invention has solved the problem of building an efficient and reliable variable speed induction motor. In its simplest form any variation of speed can be obtained by rheotatic control, the resistances being connected to the stationary windings. The rotor is of the short-circuited type, and has no slip rings. The machine is built in three types, known as H, HV2, and HV3. Type H is provided with a short-circuited rotor winding without slip rings, and has the same characteristics as an ordinary slip ring motor. The starting or regulating resistances are connected to tappings in the stator winding, and the speed can be varied from creeping to full speed by adjusting the resistances. The starting torque is controlled in the same way, the motor developing full load torque when taking only full load current. It will be seen that this motor combines the simplicity of the squirrel cage motor with the good starting and speed regulating characteristics of the ordinary slip ring machine. Type HV2 is similar to H, but the rotor has a double winding, and is provided with three slip rings. It runs at two efficient speeds without losses in resistances. Intermediate speeds are obtained by rheostatic regulation. The control is as simple as that of an ordinary slip ring motor, absolutely no changes of connections are necessary when varying speeds. This motor is particularly suitable for driving machines which require to be run for long periods at different speeds. The efficiency is high at both speeds, and the lower factor is but little reduced when running at the slower speed. Those features distinguish this motor from any previous attempts to produce a really satisfactory two-speed motor. It is also particularly adaptable for driving machines which have to be frequently started and stopped, and which have to exert a large starting torque. It will develop full load torque taking only .7 times full load current; or it will start against twice full load torque, taking only 1.4 times full load current. When taking a starting current equal to the full load current it will develop about 1.45 times full load torque. From the above it will be understood that the losses in resistances when starting or run-

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ning at speeds below synchronism are far lower than those of a slip ring motor of ordinary design. For variable speed work, such as winding or hauling, or for driving locomotives, it is claimed that this motor is the most efficient on the market. Besides the great saving in rheostatic losses, much smaller and more convenient regulating gear is used with this motor. For driving large ventilating fans or machine tools it is particularly suitable. The ratio between the two efficient speeds is a very convenient one, being generally 2.3. Type HV3 motor is exactly similar to the above, but is provided with a change-over switch in the stator circuit. This enables the motor to run at three efficient speeds without rheostatic losses. Intermediate speeds are obtained by the use of resistances, as in the case of the H and HV2 machines. The efficiency is high at all speeds.

Abstracts of Electrical Patent Applications.

(C.) 196/10. Tullio Bubola. Improvements in apparatus for electro-chemical treatment of ores. 28.4.10. This patent deals with an apparatus for the electro-chemical treatment of ores:—It consists in a combination of a vat (coated internally with non-conducting material), to contain the ore and treatment liquid, an electrode placed in the lower part of the vat, movable rod-like electrodes depending into the upper part of the vat, the mechanism required to move the upper electrodes, and a few other details consistent with the working of the apparatus. The electrode in the bottom of the vat constitutes the anode and the movable electrodes in the upper part of the vat the cathodes. The solution is injected below the filter floor. The combination further includes the means for passing the electric current through the ore and liquid in the vat, a precipitation box, and the means of circulating the solution.

(C.) 227/11. Arthur Francis Berry. Improvements in or relating to electrical transmission and distribution systems. 21.4.11. This is an arrangement which aims at protecting a transformer from the effects of lightning or electrical surging by automatically placing a coil of considerable impedance or a supplementary transformer in series with the transformer to be protected and providing a path to earth by means of spark gaps or equivalent electrical discharging devices. The automatic action is effected by electro-magnetically operated switches.

(C.) 256/11. Richard Benard Rinnie. Improvements in apparatus for automatically signalling to the driver of a hoisting or hauling engine the fact that a skip, cage or like vehicle has left the track or guiding means. 6.5.11. This invention relates to a method of electrically signalling to a winding engine driver the fact of his skip having left the rails. Boards are placed immediately above and below each divider, and contacts are fixed to board and divider in such a manner as to be closed by the impact of the derailed skip. The carrying away of a divider with its contacts is provided for by providing at each divider spring operated contracts.

(C.) 452/11. James Henry Alling. Process for recovering metals from ores. 11.8.11. This application relates to the recovery of gold or other metals by a process of mixing the pulp containing the auriferous material with a solution of salt, or another chloride, and passing same through an electrolytic apparatus which has anodes of graphite and cathodes of mercury. The intention of the process is that the coarse clean particles of gold are caught direct by the mercury, while the finer particles are dissolved by the nascent chlorine, and then deposited electrolytically on the same material acting negatively as a cathode. An apparatus described consists of a sluice box, where the cathode mercury is employed in riffles and the graphite anodes act as baffle plates. The salt solution is added at the head of the box from a special supply tank.

INVESTORS' DIARY.

The following company meetings have been announced:—

April 12.—Transvaal Consolidated Lands.
April 17.—South Randfontein Deep.
April 25.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep; Cloverfield (Extraordinary General Meetings).
April 30.—New Era; Springs Mines; Brakpan Mines; Transvaal Coal Trust.
May 2.—Meyer and Charlton; New Goch; Roodepoort United; West Rand Consolidated.
May 3.—Cinderella Consolidated; Aurora West; Rand Collieries; New Steyn Estate; Sacke Estates.
May 8.—Roberts Victor Diamonds.
May 10.—Ferreira Deep; Ferreira G.M.; Knight Central.
May 17.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep (Extraordinary General Meetings).
May 18.—Aurora West.
May 22.—Apex Mines; New Kleinfontein.
May 28.—Benoni Consolidated; Crown Mines.
May 29.—Robinson Gold Mines; New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.
May 30.—Village Deep.
June 4.—Ferreira G.M.
June 5.—Rand Mines.
June 21.—New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.
June 26.—Transvaal Consolidated Lands.
July 19.—Transvaal Consolidated Lands.

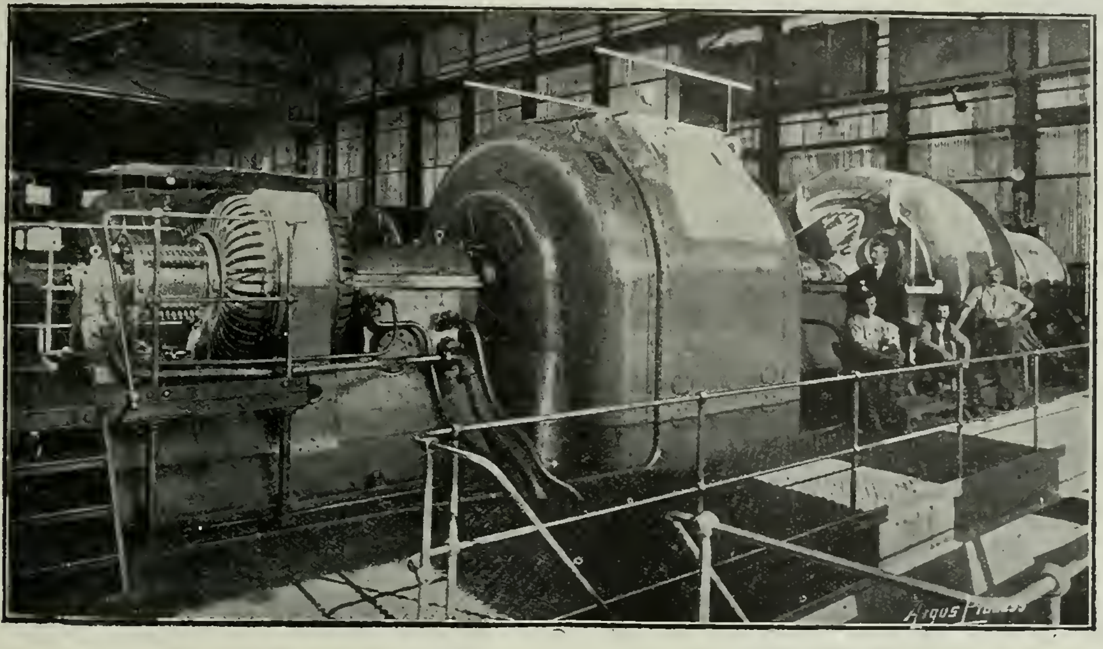
New Era Consolidated.

The shareholdings of the New Era Consolidated are represented in the company's balance sheet for the year ended December 31, 1911, by an amount of £103,684 1s. 6d., subject to a depreciation provision of £27,902 13s. 7d., rendered necessary by the continued unfavourable mining market conditions which prevailed throughout the year. As against this, however, the actual market valuation of these holdings at December 31, 1911, inclusive of the Brakpan Mines interest, amounted to a sum of £131,028 14s. 3d. The company's interest in Springs Mines, which carries with it an option on certain reserve shares of that company, continues to be shown at cost. The cash at bankers and on deposit, after making allowance for the usual sundry debtors and sundry creditors balances, amounted at the end of the year to £14,631 12s. 11d., nearly the whole of which sum is out at interest.

Engineering Notes and News.

RANDFONTEIN CENTRAL ELECTRIFICATION.

At the last meeting of the South African Institution of Engineers, Mr. T. P. E. Butt, Electrical Engineer of the Randfontein group of mines, made reference to the error said by a prominent critic to lie in the following statement:

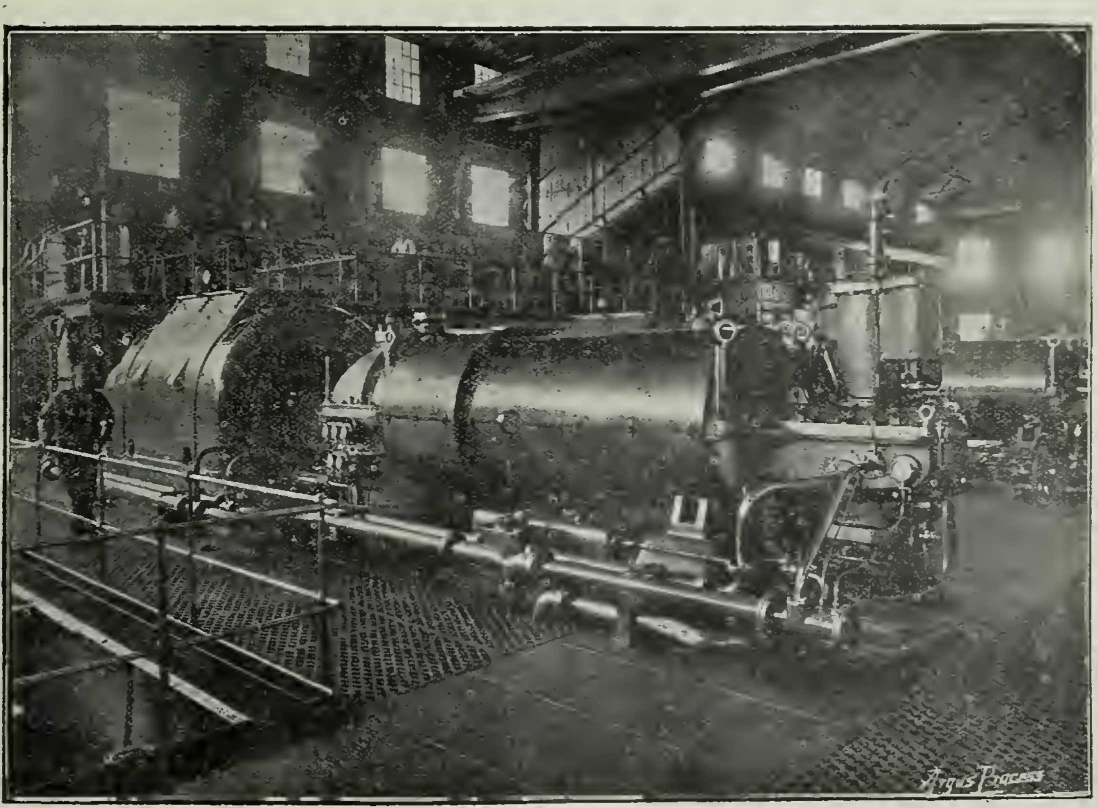


Randfontein Estates Power House.

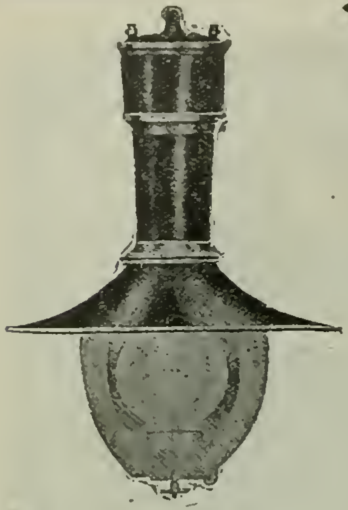
"The ammeter, under normal conditions, indicates torque exerted; under abnormal conditions, such as when exerting torque to retard speed, its indications cannot be relied upon unless the power factor is known."

Mr. Butt said:—

"I will now endeavour to prove to you the correctness of the statement in question, and to make the matter as clear as possible to those members, who, while not actually electrical men, are keenly interested in hoisting problems. Consider first the Ward Leonard hoist. I have pointed out that when operating a Ward Leonard hoist, the position of the control lever when either forward or backward from the central position is proportional to the speed at which the skip is travelling when raising a load, and that should any reasonable variation in the required torque occur, the speed due to this position of the lever will not be exceeded if the load decreases, nor reduced if the load increases. In the first case an automatic braking action will take place when the speed tends to increase, and in the second case a flow of current will automatically occur to give the necessary torque to maintain that speed under the heavier load and keep the speed constant. If reverse current for braking is re-



Another View.



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quired, the direction in which the controlling lever must be moved to effect the necessary braking is always definite, and the ammeter will indicate correctly the torque exerted against the load. It will be found, however, that owing to the automatic regenerative braking action, this reverse current braking is not required to anything approaching the extent that it is in the induction motor hoist. The position can be summed up by saying that the amperes are always proportional to the torque exerted, and neglecting losses which are insignificant, the torque ampere curve for such a hoist is a straight line. Consider now the three phase hoist :—In this case we have two operating levers, one for reversing the direction of rotation or applying reverse current to brake the load, and the other lever to control the liquid resistance which regulates torque and speed in a direction decided by the position of the first lever. In practice the two levers referred to are usually interconnected, so that one lever performs both operations. The position of the regulating lever, when regulating a load, will be proportional to the speed of the motor, *only if the load remains constant*, as, however, the load will continually vary throughout a hoisting trip this can only serve as a very rough indication. When reverse current is required for braking purposes, as when lowering an unbalanced load the direction in which the driver must move his lever to effect this is *not* definite. Such direction will depend on the position of the lever at the moment, and the speed of lowering at the moment. The ammeter readings will be nearly proportional to the torque up to the maximum torque, and as this torque could be seldom exceeded or even reached during a straightforward hoisting trip with careful driving, the ammeter readings can be said to indicate torque under normal hoisting. Should, however, this point on the ammeter be exceeded, the amperes will still go on increasing while the torque goes on decreasing, and it can be shown that, although every value of current will have a definite factor, *for nearly every value of torque that can be exerted by the motor there are two values of current*, and the above is what is referred to in my statement published in June, 1911. This fact is not as serious as it first appears, but it puts the induction motor hoist at a decided disadvantage to the Ward Leonard hoist, and this disadvantage can become very apparent when using reverse current to retard an ascending load or to brake a descending one, more especially the latter. To illustrate this fact and its effect on hoisting, it is not necessary to go beyond the "Heyland diagram." This graphical method of obtaining the working properties of an induction motor has been verified by experiment many times since it was perfected by Heyland in 1894, and is universally accepted to-day. (This diagram was shown.) . . . . I would mention that a member of this Institution communicated with me a few days since, saying that he had watched an air compressor driven by an induction motor and running on full load, during which time it registered 100 amperes. As he knew the voltage and approximate power factor at this load, he was able to calculate the horse power being used. After some time the load dropped off, but the ammeter still registered about 35 amperes. He asked me if I thought Mr. Heather could tell him what power was then being given out. Of course no one could have told him without knowing the power factor of this current for this particular machine. . . . .

In lowering loads at high speeds, the skill of the operator comes into play, for here the definite movements of the control lever in the Ward Leonard case give way to the indefinite ones of the induction type. By this I mean that a movement of the lever in one direction with a Ward Leonard hoist will always produce a definite result, while with the induction type the effect of the movement will depend on the amount of resistance already in circuit, and the slip at the moment. In cases requiring quick decision, the intuitive action of the driver is worth a great many instrument indications, and such effective intuitive action could only happen where the driver possesses a knowledge that definite results follow definite movements. This point will be still more apparent in deep shafts where large negative torques have to be dealt with. Since the action of the induction motor under hoisting or any other condition has now been investigated, it will be generally admitted, I think, that more skill is needed by the driver of such a hoist than is necessary with the Ward Leonard type. The points indicated in my paper have now, I think, been made clear. It has been shown that in the normal action of hoisting a load, the amperes will be proportional to the torque, and consequently an indicator of same. When using reverse current to retard descending loads, it will depend on the skill of the driver, by increasing or decreasing the rotor resistance at the right moment, whether he works on the rising or descending portions of the current curve. If he allows it to get beyond the maximum torque point due to the higher slip and increased voltage induced in the rotor, and this is not at all infrequent, then the current becomes disproportionate to the torque, and could no longer be termed an indicator of same as far as the driver is concerned. The fact that such current will have *some* definite value, as Mr. Heather says, is not going to help the driver very much if such values are not proportional to the reading he sees. The comparisons I effected in my paper were on the basis of simplicity of operation, and I do not think there can be any doubt as to which is the simpler of the two. I could hardly infer that the induction motor hoists are unsafe without incriminating myself, since we have a few on this group of mines which have been purchased on my recommendation, but I have carefully avoided installing them unless the conditions were so disadvantageous to the Ward Leonard type as to compensate for the greater skill required in operation."

Newcastle Water Supply.

The present water supply of the Borough of Newcastle is perhaps the finest in proportion to the size of the town that can be found within the Union. Prior to 1903, when the new reservoir was built and pumps laid down, the town received its supply by gravitation from springs situated on Signal Hill, about four miles from the town, but, in consequence of the abnormal drain on the resources during the military occupation of the borough from ten to twelve years ago, there was a great scarcity of water, and it was thought advisable to augment the supply by the erection of a reservoir on the farm Boschhoek, about two miles from town, into which the water from the Incandu River might be pumped, and the pumping plant was also laid down by the river bank, the whole of the works costing over £13,000. Filter beds were also erected, and the filtration is so thorough that Newcastle can boast of as pure water as can be found in any borough within the Union. This is borne out by the fact that the town's death-rate is reckoned amongst the lowest in South Africa. During the last month or so however, a scheme has been mooted which will not only keep up the quality of the water, but will augment the supply, and the cost of distribution will be considerably lower than the present system. The scheme is to run water from a spring situated on a high ridge on the farm "Waterfall," about half a mile from the present pumping station.

W. T. Henley's Telegraph Works Co., Ltd.

The directors' report for the year 1911 says that the accounts show a net profit of £83,831. After payment of directors' and auditors' fees, and debenture interest, and making allowance for depreciation of buildings, plant, machinery, &c., there remains £62,704, making, with £27,311 brought forward, a total of £90,015. After adding £2,403 to the reserve in respect of depreciation of Consols and other trustee securities (bringing that amount up to £8,797), the directors have transferred £10,000 to the general reserve account, and they recommend the payment of a dividend on the ordinary shares of 15 per cent., free of income-tax, of which an interim dividend of 5 per cent., free of income-tax, was paid on September 1st last. These payments will, together with the preference dividend for the year, amount to £53,153, leaving a balance of £36,862 to be carried forward.

Tenders are invited by the Rand Water Board for the supply of one turbo direct-driven centrifugal pump, capable of raising three million gallons of water per day against a head of 300 feet. It appears that at present the pumping plant connected to the Yeoville reservoir is capable only of pumping under 2½ million gallons, and as the Water Board hope to be in a position shortly to supply more than that quantity, an additional plant is being erected.

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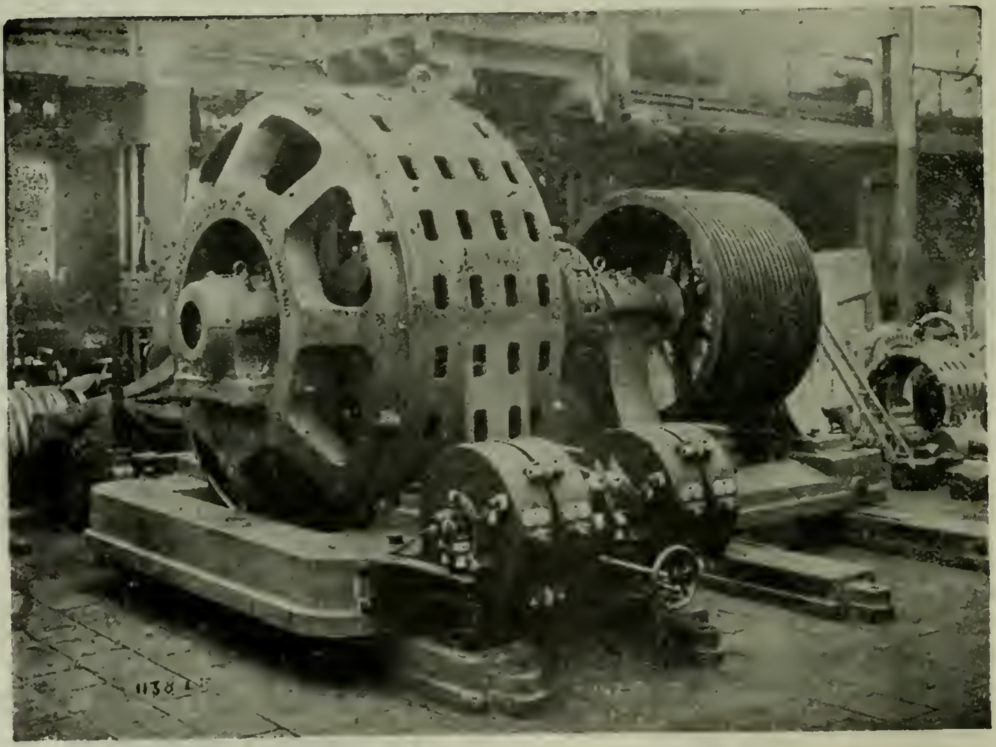

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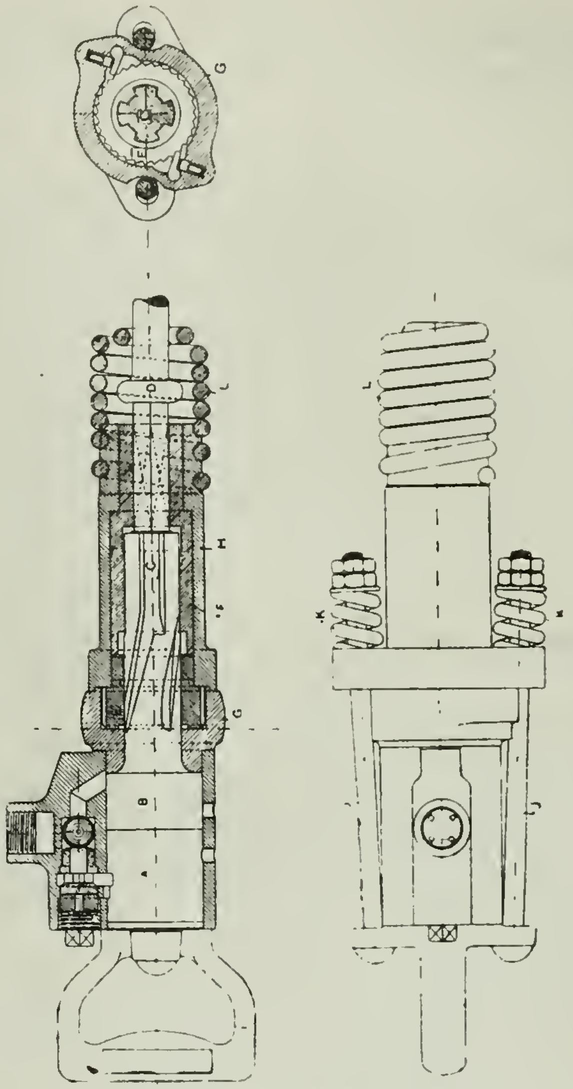
THE IMPROVED FLOTTMANN HAMMER DRILL.

Installation at the Premier Mine—High Efficiency Combined With Low Air Consumption.

The improved Flottmann hammer drill, illustrated on this page, is making good headway in this country. The Premier Mine has decided, on the result of the three days test to order 60 machines and twelve compressors. The result of a two hours' drilling test at that mine was as follows: Thirty-one 6ft. 6in. holes, equalling 201ft. 6in. were put in. The mine has now running 3 machines on one bench. These drills running throughout the 24 hours, constituting 3 drilling shifts of 6 hours, have put in a thousand feet of drilling, being run by "boys." Each of these machines only weighs 25lbs., and has a guaranteed air consumption of 25 cubic feet of free air per minute, and during the whole time they have been in use in the Premier Mine they have not given the slightest trouble, neither have they broken a single part. In drilling in the hard reef at the Premier Mine the 6ft. 6in. holes were put down in twenty minutes while using the Flottmann machines. On the Rand the size A machine, weighing 17lbs., having a guaranteed air consumption of 16ft. of free air per minute, is being used for hitch cutting, popholing, and on certain mines this machine is being used for actual stoping. The drilling results obtained in a stope of 32 degrees and 40in. average height were 6 to 8—3ft. 6in. holes per shift, the machine being operated by a kaffir. The larger machines, namely, sizes A3 and B are being used for footwall lifting and stoping, and are giving very good results. The size E machine is being used to a considerable extent for shaft sinking and winzing. The weights and air consumption of these three different sizes of machines are as follows:—

Size.	Weight	Air consumption cu. ft. percentage.
A	17	16
A3	25	25
B	32	30
E	38	35

These machines are also being fitted with various combinations of air feeds. A test was recently run with one of these types of air feeds, and the results were that 155ins. were drilled in 55 minutes, including drilling the starting holes for the airfeed device. These machines are also being mounted on a cradle to allow of their being mounted on a column bar and arm, and adapted for screw feed.



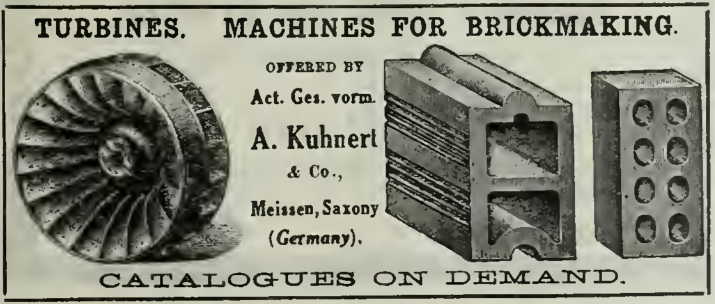
Improved Type of Flottmann Hammer Drill.

ANSWERS TO CORRESPONDENTS.

"E.M."—Liquidation is being considered by the directors.

"Tin" (Bloemfontein).—There is nothing to indicate that the reports on which the property was floated were unduly optimistic, though the present manager does not seem very successful in his methods of opening it up.

"Ex-Miner."—The washing gear is completed but not yet started. There is no particular new reason why the prospects should be regarded as improved.



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CATALOGUES ON DEMAND.

The preparatory examination into a charge of contravening the Mining Regulations against Mr. S. Penlerick, late General Manager of the E.R.P.M., was re-opened at Boksburg this week, when evidence was led for the Crown to show that the alleged false returns dated back to April, 1909, instead of to January, 1911, as stated in the original charge. After the hearing of this evidence the accused was again committed for trial, the charge being amended in regard to dates.

The following tenders for supplies to Provincial Administration, Transvaal, have been accepted:—

The Commercial General Agency, Pretoria: Firewood. B. Gundelfinger, Pretoria and Johannesburg: Hardware, etc. W. Francis and Sons, Pretoria: Hardware, etc. A. Johnston and Co., Pretoria: Hardware, etc. J. W. Augood, Pretoria: Hardware, etc., Henwood, Son, Soutter, Pretoria and Johannesburg: Hardware, etc. T. W. Beckett and Co., Pretoria and Johannesburg: Hardware, etc. E. W. Tarry, Johannesburg: Hardware, etc. National Trading Company, Johannesburg: Hardware, etc. Stewart and Lloyds, Pretoria: Tubes and fittings. V. Simpson, Pretoria: Tents, etc. Belfast Warehouse Company, Johannesburg: Sundries. T. Lewis, Pretoria: Fencing material. Pretoria Coal Company, Pretoria: Coal. Torrance and Crawford, Pretoria: Coal. Middelburg Coal Agency, Johannesburg: Coal. General Fire Appliances, Johannesburg: Canvas hose.

Finance, Commerce, and Industries.

Bank of Africa: Net Profits. The report of the Bank of Africa, Ltd., shows net profits amounting to £74,259, and a dividend of 6½ per cent. for the year has been declared. A sum of £4,000 is devoted to pensions, and £5,000 to depreciation, while £19,628 is carried forward.

* * * *

Standard Bank of South Africa. It is evident from the preliminary figures that the Standard Bank of South Africa, Ltd., has had a very successful year. We learn that the directors have resolved to recommend a dividend for the half-year ended 31st December last at the rate of 10 per cent. per annum, with a bonus at the rate of 3 per cent. per annum (together making a distribution at the rate of 13 per cent. per annum), to appropriate £20,000 to the writing down of bank premises, to add £20,000 to the reserve fund (making it £1,960,000) and £10,000 to the officers' pension fund, carrying forward about £48,000. The dividend is the same as for the previous year, but the appropriations are larger. We hope to make further reference when the complete figures are available.

* * * *

Union Public Works. The acceptance of the following important tenders in connection with the Union Public Works Department is gazetted:—Sutherland and Co., Box 96, Volksrust, £5,799, erection of police quarters at Wakkerstroom; A. G. Dunningham, Vrede, Orange Free State, £2,186 5s. 3d., erection of magistrate's residence at Vrede, Orange Free State; G. Hausleitner, Box 615, Pretoria, £6,575, erection of public offices, Vryburg, Cape Province; Brown Bros. and Reid, Hatting Spruit, Natal, £725, additions to gaol at Dundee, Natal; Waters and Clarke, Box 4789, Johannesburg, £1,170, erection of forester's house, Graskop, Middelburg, Transvaal; Wm. Bain and Co., Ltd., Box 2724, Johannesburg, £3,135 15s., erection of bridge over the Pot River, Maclear, Cape Province; Wm. Bain and Co., Ltd., Box 2724, Johannesburg, £4,176 16s. 5d.. erection superstructure for Kraai River Bridge, Barkly East; C. R. Whitwam, Box 247, Boksburg, £3.477; erection of married warders' quarters, Boksburg Prison; J. E. Dike, 106, Church Street, Cape Town, £1,363, erection of Native Prison, Kluitjes Kraal.

* * * *

Delagoa Bay Lands Syndicate, Ltd. The report of the directors for 1911 states that during the year two of the properties, known respectively as the "Forty-Acre" and "Two-Acre" plots, were surveyed and laid out in building lots, and one of the lots on the "Forty-Acre" area, in extent 2,612 square metres, or a little under two-thirds of an acre, was sold, realising a net sum of £620 7s. With this exception, the properties remain as before. The directors hope that the demand for residential sites in the suburban portion of Lourenco Marques will increase, but at present there seems to be no such demand. Under the conditions of titles the Portuguese Government have an interest of 25 per cent. in that portion of the Polana Estate coming within the Municipal area, and 10 per cent. in the remainder, excluding a portion built upon and cultivated. Certain areas for a park and observatory, equal to nearly 7 per cent. of their 25 per cent. interest referred to above, have already been set aside for public purposes, and during the year the representatives of the Portuguese Government at Lourenco Marques were interviewed by Mr. Imroth, one of the directors, and the division of the whole of the Polana as between the Government and the company was agreed upon. Unfortunately, the changes of Government that have taken place recently have prevented the company obtaining the promised confirmation of the arrangement, in the shape of a signed agreement, but the efforts being made to this end will, it is hoped, result satisfactorily. The expenses for the year are less by £200 than for 1910. Revenue shows an increase of £45 19s. 3d., and the amount carried forward to the credit of profit and loss account is £2,893 0s. 5d. An amount of £650 was paid off the loan during the year.

* * * *

Cattle Dipping. The De Beers Company gave a demonstration of cattle dipping on their farm, Grootdam, recently, to which invitations were extended to all the neighbouring farmers. A thousand head of large stock were on view, which had been dipped during the summer months, and there were entirely immune from flies and ticks. In addition, there were also 150 mules which had been dipped previously, and these were also immune. Dipping commenced at 3.30, and by 4.45 a thousand cattle and 160 mules had been put through the tank.

* * * *

Land Settlement: An Amended Bill. The amended Land Settlement Bill, brought up by the Select Committee, contains several very important changes. In the first place, the Committee has inserted a new clause providing for the introduction of settlers from oversea, no such provision having existed in the original Bill. The new clause provides that the Minister "may, by notice in the *Gazette*, and in one or more oversea newspapers, offer holdings for allotment exclusively to applicants from oversea." Such offer may be declared available for an indefinite period, or for a fixed period of not less than three months. Applications are to be lodged in the United Kingdom with the High Commissioner, and elsewhere, with any other person appointed by the Government to receive them. The High Commissioner is empowered to exercise the functions of the Land Bill in regard to the selection of applicants. The Committee has also inserted a clause limiting the number of Land Boards in the Union to five, instead of leaving it to the Government to appoint a Land Board for any area, which was one strong objection to the Bill as introduced. It is also proposed to limit the remuneration of the members of Land Boards to two guineas a day, instead of leaving the remuneration to the discretion of the Minister. Further, the Committee has introduced a clause aimed at securing the beneficial occupation of land, by providing that the lessee of any holding shall effect improvements to the value of not less than 10 per cent. of the ultimate purchase price. The issue of Crown grants is proposed to be restricted to British subjects, and the Committee have elaborated a clause dealing with advances to lessees by providing that the amount of the advance shall not exceed 50 per cent. of the capital expended by the settler on improvements, and that the total amount of the advance to any lessee shall not exceed £500.

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WHAT THE MINES BUY—£14,070,291 SPENT IN 1911.

A List of Stores Consumed by the Mines in the Union of South Africa in the Year.

THE return of stores purchased for consumption by the mines of the Transvaal during the year 1911, is as follows:—

Classification.		Totals for the Transvaal.	
		Weight or Quantity.	Value. £
Bags	value	—	16,688
Belting	value	—	145,608
Bolts, Nuts, Washers, and Rivets	lb.	4,198,909	47,918
Brattice Cloth*	value	—	528
Bricks	value	—	35,698
Candles	lb.	12,981,209	233,839
Carbide	lb.	4,033.009	41,927
CASTINGS—			
(a) Brass	lb.	499,574	29,377
(b) Iron	lb.	6,642,444	97,527
CEMENT—			
(a) Casks	No.	19,389	29,785
(b) Bags	No.	171,702	91,265
Chemicals and Assay Requisites	value	—	160,952
Coal-cutting Machines	No.	59	5,074
Coal-cutting Machine Spares*	value	—	1,830
COAL—			
(a) Smithy	tons	28,494	39,556
(b) Steam	tons	2,495,315	1,502,315
COKE—			
(a) Imported	tons	1,761	12,116
(b) Local	tons	1,989	6,071
Cyanide	lb.	11,610,323	482,072
Disinfectants	value	—	15,653
Electrical Machinery (as detailed in statement below)	value	—	848,442
EXPLOSIVES—			
(a) Blasting Gelatine	cases	507,112	1,149,818
(b) Gelignite and Gelatine Dyna	cases	180,628	308,565
(c) Dynamite No. 1	cases	2,548	3,376
(d) Dynamite No. 2 and Ligdyn	cases	55,710	70,922
(e) Other Explosives	cases	1,873	2,437
(f) Detonators	boxes	323,667	36,482
(g) Electric Detonators (or electric fuses)	No.	361,375	1,931
(h) Safety Fuse	coils	8,048,426	148,509
Fencing and Wire Netting	value	—	4,896
FODDER FOR STABLES—			
Bran, Chaff, Mealies, Forage, etc.	value	—	34,099
Hosing (steam, suction, and rock-drill)	value	—	69,768
Hand Tools (Picks, Shovels, Hammers, etc.)	value	—	83,245
IRON—			
(a) Bar and Angle	lb.	10,982,512	88,565
(b) Galvanized	feet	1,609,067	35,149
(c) Sheet	lb.	398,741	3,627
Lamps and Spares*	value	—	11,953
LEAD—			
(a) Pig	lb.	158,227	1,516
(b) Sheet	lb.	59,424	827
LIME—			
(a) White	bags	451,531	114,388
(b) Blue	bags	38,684	7,111
LUBRICANTS—			
(a) Oils	galls.	1,109,527	126,995
(b) Grease and Tallows	lb.	4,445,664	67,775
Machinery and Machine Tools (as detailed in statement below)	value	—	1,238,418
Mercury	bottles	3,258	29,640
Metals (Anti-friction)	lb.	286,076	23,945
Mill Screenings	value	—	31,921
Mill Spares	value	—	118,376
FOODS, etc. (for coloured labourers)—			
(a) Beans and Rice	lb.	11,730,076	87,559
(b) Meal (Mealie, Kaffir Corn, etc.)	bags	613,287	324,575
(c) Malt and Cereals for Beer	value	—	17,599
(d) Meat	lb.	31,136,950	471,658
(e) Salt	lb.	1,248,817	2,266
(f) Groceries, Coffee, Sugar, Molasses, etc.	value	—	35,489
(g) Sundry Food, including bread	value	—	131,562
(h) Vegetables	value	—	47,456
(i) Medicines, etc.	value	—	33,277
(j) Clothing	value	—	20,209
Packing	lb.	479,423	47,858
Paint, Tar, Drying Oils, etc.	value	—	25,122
Paraffin	cases	45,041	25,693
Pipes and Pipe Fittings	value	—	453,392
Rails, Crossings, Sleepers, etc.	value	—	268,223
Rock Drills	No.	3,956	87,703
Rock Drill Spares	value	—	180,548
ROPES—			
(a) Wire	value	—	119,159
(b) Cotton and Manilla	lb.	407,381	14,834
Screws, Nails, etc.	value	—	20,483
Shoes and Dies	lb.	15,216,830	137,533
Skips and Spares	value	—	23,386
Stationery	value	—	61,132
STEEL—			
(a) Bar, Tool, Cast, etc.	lb.	2,540,859	31,925
(b) Sheet	lb.	12,266,390	86,304
(c) Hand-drill	lb.	5,096,060	76,174
(d) Rock-drill	lb.	7,377,191	110,924
TIMBER—			
(a) Building Material (Ceilings, Floorings, Doors, etc.)	value	—	44,038
(b) Oregon, Pitch Pine, etc.	cub. ft.	1,651,992	313,674
(c) Mining Poles & Round Lagging	value	—	251,180
(d) Deals	feet	6,144,639	168,666
(e) Fuel	value	—	14,118
TUBE MILL REQUISITES—			
(a) Pebbles and Flints	value	—	4,817
(b) Liners	sets	530	60,509
(c) Other Requisites	value	—	15,806
Trucks and Spares	value	—	108,091
Washing Plant Spares*	value	—	11,193
Waste	lb.	864,366	18,294
Water (purchased)	value	—	127,251
Zinc and Zinc Discs	lb.	9,573,807	158,047
Sundry Articles not specified above	value	—	456,621

The detailed statement of "Machinery and Machine Tools" and "Electrical Machinery" as shown (gross) in the above table is as follows:—

Classification.	Totals—Transvaal Mines.
Machinery and Machine Tools—	Value. £
Water Purifiers	96
Boiler Plant, other than of Locomotives, Traction Engines, or Steam Wagons	85,732
Headgear	48,349
Steam Engines—	
(a) For Winding	88,098
(b) For Pumping, including Pumps if directly driven	2,101
(c) For Compressors, including Compressors	82,834
(d) For generating electricity*	516
(e) For other purposes	5,081
Pumps—	
(a) Airdriven	7,829
(b) Driven indirectly by Steam	5,353
(c) Driven indirectly by Electric Motors	52,712
(d) Driven indirectly by Gas or Oil Engine	2,012
Steam Locomotives	14,426
Traction Engines	730
Steam Lorries	—
Motor Wagons—	
(a) Electric	—
(b) Oil	—
Gas or Oil Engines	19,193
Mechanical Lifts and Elevators other than Belt Conveyors and Elevators	7,868
Belt Conveyors and Elevators	36,177
Other Mechanical Haulage	27,215
Reduction Plant, excluding Engines and Consumable Stores, such as Shoes and Dies, Screenings, etc.	255,380
Washing Plant*	6 104
Treatment Plant, including Furnaces	156,201
Workshop Plant, excluding Engines and Motors	21,624
Mine Ventilation Plant, excluding Engines, Compressors, and Motors	18,739
Diamond Drills (property of company)	497
Miscellaneous Machinery not particularized above	293,551
Total Value [shown under the heading "Machinery and Machine Tools" (Stores Consumed)]	£1,238,418

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* Figures for items marked with an asterisk are for the second half-year only.

Classification.	Totals—Transvaal Mines.
	Valne. £
Electrical Machinery, including Fittings for Power and Lighting—	
Electric Generators and Engines driving same if directly driven	11,655
Electric Hoists, including Motors	322,479
Electric Locomotives	6,583
Electric Motors driving Pumps, including Pumps, if directly driven	13,277
Electric Motors, not included abovo	87,355
Power Lines, Transformers, etc.	177,462
Miscellaneous Machinery not particularized above	199,631
Total Value [shown under the heading "Electrical Machinery" (Stores Consumed)]	£818,442

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The following table gives the total expenditure on mine stores in the Union for the year:

		Gold Mining Industry.	Diamond Mines.	Coal Mines.	Base Mineral Mines.	Lime and Flint Works.	Total.
		Value. £	Value. £	Value. £	Value. £	Value. £	Value. £
Witwatersrand	£11,216,456						
Outside Witwatersrand	436,868						
Total Gold Mines	£11,653,324						
Reef Diggers	26,909						
Metallurgical and Tailings Works	27,053						
Transvaal		11,707,286	271,219	276,071	152,259	53,446	12,460,281
Cape Colony		750	660,752	5,850	152,986	No record.	820,338
Orange Free State		285	518,156	43,968		362	562,771
Gold Mines	£3,367						
Reef Diggers	3,067						
Natal		6,434		218,893	585	989	226,901
Union of South Africa .. .. £		11,714,755	1,450,127	544,782	305,830	54,797	14,070,291

Contracts Open.

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of 350 tons of oats required at Capetown (April 9).

Mr. C. W. Hudson, Esq., hon. secretary Church Building Committee, Nederuitch Hervormde Gemeente, P.O. Box 12, Ventersdorp, invites tenders for the erection and completion of a church at Ventersdorp (April 19).

The Town Clerk, Kroonstad Municipality, invites tenders for the supply and delivery of 500 sanitary buckets (April 11).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of white and yellow mealies required for the Transvaal Province (April 2nd).

The Town Clerk, Germiston Municipality, invites tenders for the supply of one horse-drawn portable tar spraying machine, of 250 to 320 gallon capacity. The machine is to be fitted with chimney and shafts complete, and to be provided with a set of lifting and tilting gear and strainer, and discharge pump with hose and spraying nozzle capable of discharging tar at a pressure of 100lbs. per square inch (April 3); also for the supply of 8,000 gallons of tar (April 3).

The Secretary, Rand Water Board, Corner House, Johannesburg, invites tenders for the supply of one turbo-direct-driven centrifugal pump, capable of raising three million gallons of water per day against a head of 300 feet (April 30).

The Town Clerk, Municipal Council of Johannesburg, invites tenders for the supply of anti-friction grease (April 5).

The Secretary, Lichtenburg School Board, invites tenders for the supply of locally made school furniture to the Board for the period 1st April, 1912, to 31st March, 1913 (April 15).

The Provincial Secretary, Wale Street, Capetown, invites tenders for the erection of bridge over the Little Brak River (April 10).

The Chairman of the Tender Board, Provincial Secretary's Office, Bloemfontein, invites tenders for the erection of a bridge over the Rhenoster River (April 16).

The Chairman of the Tender Board, Provincial Secretary's Office, Market Street, Pretoria, invites tenders for the erection of a school for 100 pupils at Fontainbleau, Johannesburg (April 19).

The Chairman of the Tender Board, Provincial Secretary's Office, Market Street, Pretoria, invites tenders for the erection of an isolation ward, Krugersdorp (April 12).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of Oilskin Capes and Mackintosh Overall Leggings to the Department of Posts and Telegraphs during the period 1st July, 1912, to 31st March, 1915. The approximate annual requirements are 500 black oilskin capes and 500 black mackintosh overall leggings (June 5).

RISING SOUTH AFRICAN INDUSTRIES.—I.

The Tirucalli Rubber Industry in Natal—Details of the Progress Made in Face of Difficulties

For many years the existence of vast numbers of trees of the Euphorbiaciae family in the lowlands of Natal has been common knowledge, but the rubber boom of 1910 was mainly responsible for the fact that a Durban syndicate becoming aware that the latex of at least three varieties contained caoutchouc in marketable quantities, first acquired a concession over the Tugela Valley, where the varieties in question flourish in unprecedented numbers. This done, the syndicate was at a standstill; for, although it could be proved by analysis that rubber existed in these latices, the knowledge possessed by the syndicate members did not extend beyond this theoretical certainty. With no practical experience of rubber-growing, collecting, or treatment, the difficulties of turning their vast assets in the shape of untold millions of trees into a commercial industry was an insuperable one. We believe we are correct in stating that the Tirucalli concession in the Tugela Valley was hawked from Johannesburg to London without success. Like the extraction of gold from sea-water, the process of producing rubber in minute quantities from, for example, the sweet potato, the tapioca plant, spurge and milkwort offers few difficulties to the skilled qualitative analyst. An incredulous capitalistic world viewed the project in much the same light, and turned, but grudgingly, unconvinced ears to the sanguine promoters of the syndicate. It was left for Mr. Herbert Noyes, himself a rubber plantation owner in the East, and a resident for many years of the Malay Peninsula—the home, par excellence, of plantation rubber—to turn, for the first time a practical eye on the possibilities of the euphorbia tirucalli. On his way from London to Mozambique to report on some Ceara plantations, Mr. Noyes met and was persuaded by some of the original members of the syndicate to visit the Tugela Valley. Six months later, through his agency in London, the Tirucalli Rubber Concessions, Limited, purchased outright from the original concessionaries, the sole right to the euphorbiae in the Tugela Valley. Work was commenced at once, no money was asked from the public, and no advertisement given to the proposed industry, beyond a sceptical outburst from a certain section of the press that scoffed violently at the idea of anything good coming out of—well, Natal. Yet, without a break, quietly and unobtrusively, production has been going on since the inception of the present company. It will come as a surprise to many to learn that an average of a ton per week of the crude coagulum has been shipped to London for many months past. Further, that the possible output is only limited by the number of men employed in tapping. Such a position as the latter illustrates is unparalleled in the history of either wild or plantation rubber; the fact remains that there are, on the Tugela concession, literally millions of trees ready to be tapped, exclusive of those that have perished at the hands of the original concessionaires, who, in their ignorance of the first rudiments of scientific producing, cut, hacked, mutilated and destroyed every tree they had—save the mark—tapped. So many misconceptions exist as to the tree itself, its appearance, habitat, etc., that one can scarcely do better than to quote botanical description, which is as follows:—"E. Tirucalli, Linn. A bushy tree 4-8 metres high, with stems up to 30 c.m. diameter: much branched, drooping, the younger branches cylindrical, terete, 6-10 m.m. diameter, produced few together, or in irregular whorls, or separately, terminating abruptly, leafless and without spines, and carrying the inflorescence on the point. Flower heads numerous, almost sessile, on short divaricately divided 2-4-6-8 flowered peduncles, each head about 6 m.m. diameter, enclosed within 5 flat glands, etc., etc." The present management has devoted both time and money in determining the best method of tapping. System after system, as applied to the tapping of ordinary rubber-producing trees has been tried and discarded, and it is only within the last month or so that a method has been evolved which appears to meet all requirements. The best tapping results are obtained by umfaans, and an energetic youngster can easily bring in his 15 pounds of latex early in the afternoon; as much as 30 lbs. has been collected in one working day by a single boy working among well-developed trees. The latex is strained and placed in vats to await coagulation, which is effected by means of a process jealously guarded by the management. Subsequently, it is made up into blocks and shipped in ordinary gunny bags.

Investigations have already been proved that re-tapping of trees can be carried on with remarkable frequency; and that, although, owing to the number available, there will be no necessity to strain, unduly, the recuperative powers of a tree, it would be practicable, should necessity arise and labour conditions permit, to tap each individual tree at least once a month. In this respect, considerable technical knowledge is essential on the part of those in charge of tapping gangs. Should the tapping chisel penetrate the cortex too deeply, and as much as bruise the delicate film, lying between the bark and the timber—technically known as the cambium—an attack by white ants or an incursion by borers is a foregone conclusion. But so far as safe tapping is concerned, there is no danger of either. For, in a country infested by such pests nature has evolved an adequate protection against both. The latex of the Tirucalli contains a subtle volatile essence—unknown to scientific chemistry—which is of a sufficiently poisonous nature to preclude the intrusion of animal life through the thin coating or latex, which, when the adjacent cells have been drained of their contents forms and dries quickly over the wound made by the chisel. It was originally intended to erect either in Natal or in England, a plant devised by Dr. Schidrowitz, the famous rubber chemist, for the separation of rubber from the resinous and other constituents. Subsequently, however, and since the crude material became known in English and foreign markets, it has been ascertained that it can be used effectively for half a score of different purposes, not the least among them being electric insulation, road making, for mixing with higher grades of Para to bring them down to a manufacturing standard: for anti-fouling paints, and for use in many industries that can adapt the raw material to their requirements with more facility than that necessitated in purchasing pure rubber, and afterwards blending it to an artificial consistency. Pure rubber in the manufacturing world is an unknown quantity.

Of the two other species of more or less valuable euphorbiaciae found in the Concession and elsewhere, much remains to be learnt. It is certain that neither the euphorbia grandidens, vulgarly known as a "Cactus," and the E. Candelabra contain as good a quality of rubber as the tirucalli. And it is in the no less certain knowledge of the writer that so far, no living person has yet studied either of these trees with a view to determining a satisfactory method of tapping and treating them. Both are absolutely different to the tirucalli, in cellular formation and distribution of the cortex. Ordinary tapping is out of the question in both instances. Yet it may be assumed that eventually careful research will succeed in evolving some suitable method for treating these trees on a commercial and payable scale. Both present alluring and interesting problems for the practical rubber expert.

Natal Bank.

The Natal Bank Private Bill, as amended by the Select Committee, enables the directors to arrange for the amalgamation of the bank with any company or companies having objects altogether, or in part, similar to those of the Natal Bank, or for the sale or disposal of the undertaking of any branch subject to the approval of two-thirds of the shareholders.

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FACTS REGARDING THE

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WORTH REMEMBERING.

1. The **TRANSVAAL** is producing over one-third of the World's Gold Output.
2. **TRANSVAAL** Mines have spent 24 millions sterling on machinery and plant.
3. The **"South African Mining Journal"** is the **Official Organ** of the **Mine Managers' Association.**

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Automobile Notes.

The Trapping Crusade.

The authorities have been remarkably energetic for some time past in their trapping crusades, and motorists have had to be very sharp-witted of late to evade the vigilance which has been exercised in many districts, and places hitherto immune in this respect. One must come to the conclusion that the police are determined to put an end to furious driving, and the sooner the motorist is acquainted with this fact the better for all concerned; although the system adopted to effect this end cannot be recommended, and is in general disfavour with all motorists. The recent outburst of official zeal, however, will not pass unrewarded if the absurdity of the existing speed limit of ten miles an hour becomes apparent to the responsible authorities, who, it must be remarked, cannot fail to be aware that every motorist is daily guilty of a breach of the particular by-law governing speed. At the same time a conviction in the past for driving at a less speed than twenty miles per hour has seldom been attempted. More attention should be directed towards the motorists that disregard the rules of the road, and who in reality are the chief offenders, from the point of view of the public safety. The motorist, for example, who neglects to signal his intention to deviate from a certain course is more to be feared by pedestrians and other road users than the man who exceeds the speed limit on a stretch of road where the traffic is in no way congested: and those again in the motorist ranks who fail to warn, by hooter or other means, their exit from side streets, constitute a menace which the authorities, in the main, strangely enough, overlook, although the practice is highly dangerous.

Second-hand Cars.

The increasing number of old and second-hand cars coming under the auctioneer's hammer, and being disposed of through other channels, is probably one of the most significant signs of the progress being made in the motor industry, as in the majority of cases those sharing this fate are being replaced by the present-day makes of cars, in keeping with the natural order of things. The second-hand car market is singularly well supported, despite its inseparable element of chance, the purchases being employed for a variety of uses; the chassis of many old cars, for instance, being fitted with bodies adapted for commercial purposes; others, again, in the renovated state finding ready acceptance with the novice and the man of limited means. To keep abreast of the times several of the larger Johannesburg companies are discarding in wholesale manner vehicles which have been in use for some years past, and are purchasing largely modern types, which naturally embody every new principle, method of construction, and devices which have proved practicable in automobile manufacture up to the present time. Many of the cars so discarded, it had better be mentioned, lest the term may appear ambiguous, are in excellent condition as a rule, and command a ready sale, being quite distinct, of course, from the types which may be classified as obsolete, and appear so ludicrous to-day.

The Automobile Exhibition.

The whole of the exhibition space in the automobile section of the Agricultural Show is contracted for, and some very smart cars, it is expected, will be presented to the

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public. Commercial vehicles will also be given the prominence they deserve, as this branch of the business, which the American manufacturer styles the "truck movement," is considered the bulwark of the industry, and undoubtedly the development has been nothing short of remarkable in recent times. The demand, amounting almost to a craze, in the past for pleasure cars, and the incidental profits in their manufacture, were too great to be resisted, and makers as a rule gave little consideration to the production of the commercial car, until the demand for motor traction developed with an insistence which none could afford to underestimate. This demand is being steadily maintained at Home, and also in the colonies, to such an extent that several manufacturers feel it incumbent to altogether specialise in, and build exclusively, vehicles for commercial purposes.

The Motor Passenger 'Bus.

The motor passenger 'bus is practically an untried proposition in Johannesburg, and it is extremely doubtful, having regard to the excellent tramway system, in network fashion, which serves all suburbs, if the introduction of a motor-bus service would prove remunerative, and only the opening up of new suburbs would in any way justify such an enterprise. Were a scheme, however, of this nature contemplated, an analysis of operating costs in regard to petrol, oil, repairs, stores, cleaning, drivers' and conductors' wages, and other sundry charges based on the present prices obtaining for supplies, and the prevailing rate in point of wages which exists in Johannesburg, would make it patent at once that the promoters of a motor-bus service, under the present conditions, could never with any hope of success compete against overwhelming odds, chief of which are the immense facilities afforded by the present system of tramways of which Johannesburg is justly proud.

The Storage of Petrol.

A clean and absolutely safe method of storing and handling petrol in the private motor house, or the city garage, is provided in the Steel Bowser Gasoline Storage Outfit, which may be of any required size, buried underground outside the actual premises, and connected by a suction pipe to a pump located at the most convenient point inside. These tanks, as pointed out, are essentially steel, and coated with a rust-proof paint so that they can be placed in the ground without the expense of a vault or other protection. In addition, the equipment is thoroughly evaporation and fire proof, and for motorists who study strict economy is eminently desirable; and the fact that risk is largely eliminated in the transfer of petrol to the tank of the car by a special hose which prevents exposure of the gases to the air, entitles this storage outfit to more than a passing consideration from those even outside the motorist community, such as insurance companies, and others to whom precautionary measures in regard to outbreaks of fire are of primary importance.

The State of the Roads.

The state of many main roads outside the municipal area at present calls for the scrutiny of those responsible. Motorists are loud in their complaint in regard to the Johannesburg-Pretoria Road, and the P.W.D. who control it would be well advised, in order to avoid being accused of neglect, to devote early and careful attention to the fast-wearing crust of this once ideal road. Why this famous stretch, considered by many as the finest road in the Transvaal, should be allowed to fall into disrepair is not quite obvious, even having due regard to the immense nature of the task which the maintenance alone of constructed roads constitutes. Within the municipal area also the roads afford just grounds for complaint, and the motorist's grievance is far removed from the imaginary stage, when the great question of roads is analysed. Professional men, and doctors in particular, whose work involves much traversing of roads in town proper, speak in any but gratifying terms of their condition, and the inconvenience and incidental expense which the many detours entail, performed for the sake of the better travelling made possible on other sections of the road system, are very considerable to those with whom time is a valuable asset. Naturally all roads cannot boast of macadamised or tarred surfaces, but periodical attention, in return for the ratepayers' contributions, might be paid to the pot-holes which abound in so many streets at the present time.

Motor Tyres from Spineless Cactus.

Mr. Luther Burbank, the American horticultural expert, has discovered that it is possible to manufacture whitewash, paint, motor-car tyres, and printing paper from the leaves of the spineless cactus. The fibre remaining, he states, when the mucilage has been extracted makes a fine substitute for rubber, and will make more durable motor-car tyres and similar things than rubber itself.

Our Twenty-First Anniversary Number.

THE LAST WORD ON RAND MINING.

To commemorate the twenty-first anniversary of the founding of this journal, a special number, distinct from the ordinary weekly issue, will be issued in June next. Fittingly to mark the occasion, the number will contain a comprehensive and concise account of the past history, achievements and present position of every gold mine on the Rand, illustrated and brought down to the latest possible date. It will review the industry generally as well as in its several technical aspects, and will include articles by experts on the chemical, mining and metallurgical progress and problems of the fields. A feature will be made of the personal side of the industry, and a section will be devoted to its technical and administrative leaders, enriched with portraits and other illustrations. Engineering on the Rand in all its phases, electricity, steam and air power will be treated, and the growth and progress of electric power supply will be exhaustively discussed. The gold mines of the outside districts and the tin, copper and coal industries of those districts will be dealt with thoroughly and at first hand. The great diamond industry of South Africa will have a section to itself, and here, as in the treatment of the base metal industries, the letterpress will be embellished with many striking and original illustrations. Mining in the Cape, Natal and Orange Free State Provinces will also be reviewed and the undoubtedly great mineral potentialities of those, as yet undeveloped, areas will be graphically set forth. German South-West Africa will find a place in the issue and a first-hand account of the diamonds, the copper and the tin mines of that promising field will be included. Moreover, the banks and other great financial institutions, the railways and harbours of the sub-continent will be adequately dealt with, and the whole problem of transportation as it affects the inland industrial centres will be reviewed. In this connection Capetown, Port Elizabeth, Durban, East London, Delagoa Bay and Beira will be separately and fully treated and their claims examined. Apart from mining, there will be a considerable section devoted to a description of the several subsidiary industries dependent on mining for a market. Chief among these will be cement, explosives, soap and candle-making, milling and the hundred and one activities that centre in the Rand. Rhodesia and Mozambique will be given a separate and extended treatment. The different mines will be described and illustrated, and the recent progress of the industry in those territories dealt with comprehensively and lucidly. In addition, the issue will contain a number of interesting and valuable contributions from leading men in the mining and financial world, many of whom have already sent their congratulations on the decision to issue a special commemorative number of the journal. Numerous letters received from past Rand engineers and mine managers, now resident in all parts of the world, contain offer of contributions. These will form a unique collection of valuable views and reminiscences, and will considerably enhance the interest of the volume. The work will consist of upwards of 350 pages, printed throughout on art paper. Prizes are offered to artists for the best design of a suitable and striking character, and particulars are given in another part of this issue of other valuable prizes to be awarded in connection with the number. It may be added that the work will be prepared, produced and printed in South Africa, and will aim to cover the whole field of mining in this country, and to prove a fitting monument to the great industry with which, from the beginning, the *South African Mining Journal* has been associated. The co-operation of everyone interested in the industry is being enlisted to make the venture a success, and already it promises to mark an advance on anything of its kind ever before attempted in South African illustrated journalism.

The Week's Company Meetings.

GLENCOE COLLIERIES.

The Coal Crisis.

E.R.P.M. Position.

The tenth annual meeting of the Glencoe (Natal) Collieries was held in the board room, Stock Exchange Buildings, last week. Mr. A. Mackie Niven presiding. Among those present were Messrs. H. Hyman, A. Hyman, E. C. Jameson, H. D. Jameson, C. J. Mansfield, and A. G. Keyworth, together with the secretary, Mr. Norman Smith.

The Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said items did not call for much comment, investments had been reduced by £2,000, being an amount provided against possible loss in realisation of the East Rand Proprietary shares, of the purchase of which as an investment you were advised a year ago, as well as £670 of the same company's debenture issue, being "rights" on your shareholding. This investment in East Rand Proprietary shares and debentures was only made after careful inquiry as to the position and prospects of the company. It was not considered to be in any sense a speculation. The company's affairs have been much before the public, and it was therefore unnecessary for him to comment on the irregularities disclosed. The latest information with regard to the company's affairs was to the effect that the sound mining policy now being followed was likely to result in such improved profits as would ensure quite a fair dividend for this year and a better one for 1913. It was probably too much to expect that the former dividend of 40 per cent. per annum would be reached under anything like present conditions as to native labour and general working costs, but the investment should return them safely 30 per cent. per annum on the nominal value of the shares, which would be about 6 per cent. on the amount originally invested. The profit and loss account showed a profit from coal account of £18,732 7s. 1d., a slight increase on the previous year's profit, despite sales of 3,975 tons less. The rents received have more than doubled, which was explained by the fact that during the year the old trading rights' lease expired. This had been a servitude on the property since the formation of the company, at a totally inadequate rental; new tenants had been secured, who, in addition to erecting large and commodious new premises, paid a rent more in keeping with the privileges granted. Interest account, £566 13s. 10d., was largely increased owing to dividends from East Rand Proprietary shares and debentures. The net profit showed in the profit and loss account was £11,459 11s. 6d.—£1,120 12s. 5d. more than last year, which, regard being had to the smaller output and heavier charges, was satisfactory. The appropriation account showed £12,649 6s. 5d. brought forward from 1910, to which had to be added the net profit for 1911 of £11,459 11s. 6d., making a total of £24,108 17s. 11d. Dividend No. 9 absorbed £6,250, and, after making a provision of £2,000 already referred to, there remained a balance to be carried to this year's account of £15,858 17s. 11d. The volume of business had been quite satisfactory for the better-class coals, and the London agents had been obliged continually to refuse orders because of the inability of the mines to increase their outputs. Scarcity of native labour, which had been keenly felt, was the main cause, but short supply of railway trucks had had a serious effect. Had an ample supply of labour been available the outputs could have been increased by nearly 50 per cent. As will be seen from the manager's report, even with what labour he had had, he could have put out an additional twenty thousand tons of coal had there been no stoppages for want of railway wagons.

When questioned in Parliament, the Minister of Railways was reported to have said that a great demand for coal had arisen owing to the coal strike in England and that the railways were doing their utmost to meet the demand. He had been misinformed, as the bunker trade at Durban had fallen off and the increased demand for Capetown had only about equalled the failing off in the former trade. The coal strike in England had resulted in a number of inquiries for coal at Capetown and for export to the East and elsewhere. For reasons already enumerated the companies were not able to take advantage of this business to any material extent. In most coal mining countries companies which were able to continue working were generally able to take advantage of the higher prices which followed a strike, for at least a portion of their output. The custom of the trade in South Africa prevented this being done.

The report and accounts were agreed to.

Messrs. A. Mackie Niven and Dundas Simpson were re-elected to the directorate.

Mr. John Mackillican was reappointed auditor.

MARIEVALE NIGEL.

The fifteenth ordinary general meeting of shareholders in the Marievale Nigel Gold Mines and Estates, Ltd., was held in the board room, Cullinan Buildings, last week. Mr. W. H. Dawe presided.

The Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: In moving the adoption of the reports and the financial statements for the year which ended on the 31st of December last, there is very little for me to say, for, as you are aware, there has been no work done on your property, and there have been no developments of importance in the way of mining in the district in which your property is situate. At a meeting of shareholders which was held on the 2nd of October, 1908, your directors were given authority to allow the 241 claims owned by the company to lapse, and also to do whatever they deemed fit in regard to the mynpachts, and I have to inform you that up to the present neither the claims nor the mynpachts have been allowed to lapse. The company had an available cash balance, on the 31st of December last, of £9,345 7s. 3d., after allowing for amounts due to sundry shareholders which have not yet been claimed. You will notice that the expenditure for the year under review exceeded the revenue by £236 15s. 9d. I might also mention here that to enable European shareholders to receive and consider the annual reports and accounts before issuing their proxies for representation at the annual general meetings, your directors have decided to hold these meetings in future during the month of May in each year, and that in order to carry this policy into effect an extraordinary general meeting of shareholders has been convened for the 25th of April, 1912, to make the necessary alterations in the company's articles of association.

The report and accounts were adopted. The retiring directors were reelected and the auditors reappointed.

PHOENIX GOLD MINES.

A Waiting Policy.

The tenth ordinary general meeting of shareholders of the Phoenix Gold Mines, Ltd., was held in Bettelheim Buildings on Saturday, Mr. Harry Graumann presiding. There were present: Messrs. J. H. Ryan, J. Andrew Cohen, T. S. Wilks, J. Jeffries, C. S. Mann, S. S. Graumann, W. Just and S. B. Dowling (secretary), representing 269,760 out of 700,000 five shilling shares.

The Chairman's Speech.

The Chairman: In submitting the directors' report, balance sheet and profit and loss account for the financial year ended the 31st of December, 1911, for your consideration and adoption, I would firstly bring to your notice that the issued capital of your company remains unchanged and stands at £175,000 in 700,000 shares of 5s. each. The company's property consists, as mentioned to you at the last annual meeting, of a freehold portion of the farm Witpoortje, of which one hundred morgen is held under mynpacht brief, five hundred and sixty-eight on Finaalspan, and the freehold farm Rietfontein, situated in the Waterberg district and in extent 1,282 morgen, in the locality where tin has been discovered. No work has been carried out on your property during the period under review. The policy of your board regarding operations is—as previously reported to you—of a waiting nature, and it was hoped the results of mining operations in the neighbourhood would prove useful, but the information it was expected that would be available for assisting your board in arriving at a definite policy as to future operations has not been forthcoming. We are retaining our cash resources so as to be able to utilise them to the best advantage when information is available. The financial position of your company is fully revealed in the audited statement of accounts presented, and you will observe that the cash available amounts to over £27,000. With these few remarks I beg to move the adoption of the reports and accounts.

The motion was carried.

Messrs. J. H. Ryan and J. Andrew Cohen were re-elected directors.

Messrs. Diamond and English were reappointed auditors.

VOGELSTRUIS CONS.

The fifteenth ordinary general meeting of shareholders in the Vogelstruis Consolidated Deep, Ltd., was held in the board-room, Cullinan Buildings, on March 22. Mr. W. H. Dawe presiding.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: In moving the adoption of the directors' report and balance sheet for the year ended the 31st of December, 1911, I would point out that as no work is being done the report is necessarily very brief. Two questions only require any reference, the first, in connection with the financial position, this is dealt with at length in the report and accounts, particulars being given of the expenditure, which was met by funds advanced by Messrs. S. Neumann and Co. The chief items of expenditure were the amount paid on account of claim licences and the amount of interest on debentures. The interest on £109,050 of debentures due on the 1st of July, 1911, and on the 1st January, 1912, has not been paid. The second question is in connection with negotiations which took place in June last between Sir Sigmund Neumann on behalf of your company and Mr. Leopold Albu on behalf of the Roodepoort United Main Reef G.M. Company, Ltd. The outcome of these negotiations was that, subject to your approval, an agreement was entered into by these gentlemen on behalf of the companies they represented, by which your company agreed to sell to the Roodepoort United as and from the 15th of June, 1911, all its claims, plant and undertakings, the purchase consideration being one share in the Roodepoort United for each block of ten shares in the Vogelstruis Consolidated Deep, and by which it was further agreed on the part of the debenture holders that they would accept 82½ per cent. for their debentures with accrued interest thereon. Your directors were pleased at the prospect of being in a position to submit a scheme for your approval which would have given you an interest in a profit-earning company, and they appreciated the fact that this proposal was made possible by the action of the debenture holders in accepting the terms mentioned, which meant a very considerable loss to them, instead of claiming payment of the debentures in full. Your directors also gave full consideration to the fact that through the accumulation of interest and the expenses entailed by the upkeep of the property your company's position would become more embarassed, and the chances of the shareholders retaining an interest in the property would be diminished. Your board therefore regrets that Mr. Albu subsequently informed your company's representative that at present he was unable to carry the matter through with the Roodepoort United Company. As shown in the last annual reports the estimated payable ore reserves at the time of suspending operations were: South reef 134,360 tons, at 5.92 dwts. over 36.93in., main reef 14,900 tons, at 5.92 dwts. over 69.72in.; so that, though the development was not sufficiently attractive to enable the company in the bad times then already existing to find the further large amount of working capital necessary, yet the indications were that the supply of further working capital would be likely to establish the mine as a profit-earning concern. We must therefore hope that a large block of ground on the main reef, practically untouched, will yet be dealt with on satisfactory terms. A further question your board has to consider is what course should be adopted which will best serve the interests of shareholders and debenture holders, in view of the fact that the company has no funds in hand and debenture interest is overdue. It may be that it would be advisable to put the company into liquidation, but in any case that question could not be dealt with at this meeting, and the views of the debenture holders should be obtained.

The reports and accounts were adopted and the retiring directors re-elected.

Messrs. C. L. Andersson and Co. and Mr. F. W. Diamond were re-appointed auditors.

RAND MINES, LIMITED.

Annual Meeting Adjourned.

The seventeenth annual general meeting of shareholders was called for this week. The number of shares represented was 600,789.

The Chairman of the company, Mr. R. W. Schumacher, said that in accordance with the circular sent out on the 27th of January, he proposed that the meeting be adjourned until the 5th of June at the same time and place, in order to give shareholders living in Europe every opportunity to study the reports carefully before sending their proxies to the meeting to be held here.

Mr. E. Friedlander seconded, and the motion was carried unanimously.

KLEKKSDORP EXPLORATION LANDS AND ESTATE COMPANY.

The fourteenth ordinary general meeting of shareholders in the Klerksdorp Exploration, Land and Estates Co., Ltd., was held in the board-room, Trust Buildings, this week, Mr. Clement Davis occupying the chair. Among those present were Messrs. H. Neuhaus, M. G. Elkan, J. L. Kuhlmann, W. A. Nellist, R. des Clayes and A. G. Newton, 160,079 shares being represented.

In moving the adoption of the reports and accounts, the Chairman said: To refer now to the reports and accounts, I find that the expenses for the past year have amounted to £1,188, against revenue of £987, the profit on investments realised amounted to £675, which we have allocated towards an amount of £895, provided to meet a lower market valuation of one of the investments held by you, so we have to deal with an actual debit of £422, which has increased the amount at the debit of profit and loss to £10,895. The value of your investments at to-day's prices is approximately £40,366, a portion of which is dividend paying. Your cash and cash assets at the 31st of December last amounted to £9,595, the greater part of which is bearing interest.

The reports and accounts were then adopted.

No directors were re-elected as it is desired to reduce the board.

Messrs F. W. Diamond and English were appointed as auditors for the ensuing year.

"SALLIES."

Reduction of Capital.

Prospecting Results.

The ninth general meeting of shareholders of the South African Land and Exploration Company, Ltd., was held this week in Bettelheim Buildings, Mr. Clement Davies presiding. There were present: Messrs. G. C. Fitzpatrick,, E. Friedlander, C. L. Andersson, R. W. Anderson, H. Daniel, J. Mitchell, L. A. Rothschild, J. H. L. Manisty, S. Lavenstein, G. L. Graham, T. Brockbank, P. Bolton, S. H. van Diggelen, and L. A. Whiteley (secretary), representing 32,745 shares out of an issue of 399,000.

The Chairman said: The report and statement of accounts for the year under review have been in your possession for some days, and doubtless you have given the same your careful consideration. The revenue for the past year amounted to £1,027 against an expenditure of £1,561. Reference to the previous year's accounts will show that the revenue for 1911 is slightly in excess of that for 1910, while the expenditure has been reduced by some £230, which is satisfactory. The cash and cash assets at the 31st December last amounted to £7,514; since the close of the year these have been increased by further sales of surface rights to a total of £12,534, practically the whole of which is bearing fair rates of interest. At the end of 1910 these assets totalled some £4,500 only, so we show an improvement of approximately £8,000, which is distinctly encouraging. We have disposed altogether of the surface rights of some 15,000 morgen of ground, of which 7,420 morgen have been sold since I addressed you a year ago. We have had in addition inquiries for quite a number of other farms, and we hope during the current year to sell further surface rights. There is a good demand for farms in certain districts, and this, I believe, will increase, which will tend to enhance prices and when the farms in the more favoured districts are all taken up by settlers other districts, such as Waterberg, in which your company is largely interested, will come into favour. We have done no prospecting ourselves during the past year, but we threw open thirteen of your farms for public prospecting under section 10 of the Precious and Base Metals Act of 1908, and we also agreed, on certain terms, to allow the same farms to be prospected for base metals. Prospecting is proceeding on your farm Witfontein No. 1794, near the Olifants River, and I trust something may come of it. I regret that nothing resulted from the prospecting contract entered into in respect of Haartebeestvlei No. 178. Turning now to the farm Witpoort No. 12, the report gives the latest position of this and in terms of the contract entered into with Mr. R. R. Hollins that gentleman has until October next to float a company.

Reduction of Capital.

There is one further point I would like to touch on in my address this year, and I would wish it clearly understood that what I say is on my own initiative, for the matter has not been discussed by the directorate. I refer to the large capitalisation of your company, which stands at £399,000 in fully-paid shares of £1 each. I should like the views of shareholders as to whether they deem it advisable for the board to take into consideration the reduction of the capital to, say, £50,000 in £50,000 shares of £1 each, giving present shareholders one new for four old shares. In this way the debit under sundry expenditure could be eliminated and the value of your property cut down to a reasonable figure. Shareholders might then feel that they had good value for their money, and with further realisations of surface rights they might look forward to the possibility of a small yearly dividend, whereas to-day this appears to be very remote; if shareholders will give some indication of their views at this meeting or in communications addressed to the secretary, the board will, I am sure, take the matter up. Your farms have been under the supervision of the Transvaal Land Owners' Association, and I desire to express our thanks to the secretary and the district agents for their assistance in finding suitable tenants, in furthering sales of surface rights, and in the collection of rents from native squatters. I now beg to move that the report and accounts as submitted be, and they are hereby, approved and adopted.

Mr. Manisty seconded.

The Chairman took it from the remarks which had been made that the board should consider the question of a reduction of the capital of the company. (Hear, hear.)

WEST RAND MAIN REEF.

Further Interim Dividend.

The eleventh general meeting of shareholders in the West Rand Main Reef Syndicate, Ltd., was held this week in Trust Buildings. Mr. Clement Davies presiding. There were present: Messrs. B. Koenigsbert, H. D. B. Harrington, R. des Clayes, H. W. Anderson, and A. G. Newton (for the secretaries), representing 17,636 shares out of an issue of 25,000.

The Chairman: The report and accounts submitted to you to-day deal very fully with the position of your company as at the close of our last financial year. The capital and property remain as before. The revenue for the past year has amounted to £1,443, the greater part of which is obtained from the company's share of claim licences as owners of portion of the farm Witpoortje No. 44, in the district of Krugersdorp. The expenses during the year amounted to £525, showing a surplus of revenue over expenditure of £918. The financial position as at the 31st December last discloses cash and cash assets to the value of £1,590, and I hope that on the 30th June next we shall be in a position to declare a further interim dividend of 5 per cent. During the past year we have had no opportunity of dealing with the mining rights which you hold over 130 morgen, nor do we see any likelihood of doing so this year. I believe these mining rights to be of considerable value, and I hope we shall be able to deal with them to advantage at no far distant date. I beg to move that the report and accounts submitted to this the eleventh ordinary general meeting of the syndicate be, and the same are hereby, approved and adopted.

Mr. Harrington seconded the motion. It was carried.

Messrs. Clement Davies and B. Koenigsbert were re-elected directors.

Mr. A. Eckart-Beckmann and Messrs. Alex. Aiken and Carter were reappointed auditors.

WITHOK PROPRIETARY CO., LTD.

The eleventh ordinary general meeting of shareholders in the Withok Proprietary Company, Ltd., was held in the board-room, Trust Buildings, this week, Mr. Clement Davies presided, and among those present were Messrs. H. Neuhaus, R. Des Clayes, A. A. Osborn, M G. Elkan, W. A. Nellist, J. L. Kuhlmann and A. G. Newon, the total number of shares represented being 53,812.

The Chairman, in moving the adoption of the reports and accounts, said: Reference to the report and accounts before you shows that the receipts for the year amounted to £819, the expenditure was £417, and £118 were written off for depreciation on your farm properties and £2,741 on your investments. This resulted in a debit balance for the year of £2,458, which has been added to the debit of profit and loss account, bringing that amount up to £7,747 as at the 31st of December, 1911. Your investments, cash and cash assets at the close of the year were worth approximately £10,500. With regard to the main asset of the company, the farm Withok, your lessee, Mr. M. Geerdts, has continued the cultivation of same to the satisfaction of the board, and we have decided therefore to give him an extension of his lease for a period of five years from the 1st of October, 1912, at an enhanced rental.

The reports and accounts were adopted.

The retiring directors, Messrs. C. Davies and H. Neuhaus, were re-elected, and Mr. Charles Stuart was appointed auditor for the ensuing year.

TUDOR G. M. COMPANY.

Studying Economy.

The eleventh annual meeting of shareholders of the Tudor Gold Mining Company was held this week at 11.45 o'clock, in the board-room, Silesia Buildings. Mr. M. G. Elkan presided, and there were also present Messrs. H. Neuhaus, G. C. Fitzpatrick, B. Moses, M. Rode, W. R. Crowhurst, and Dr. W. Squire, with Mr. W. M. Tudhope, secretary, representing 201,077 shares out of an issue of 340,000.

The Chairman, in moving the adoption of the report and accounts, said: Gentlemen, as you will have seen from the directors' report and statements of account, which have been in your hands for some time, no work has been carried on on your property during the past year, but, of course, the caretaker is doing all that is necessary to keep your houses, machinery, headgears, etc., in good order and condition. Your board has continued to realise certain machinery, plant, etc., at such prices as it will cost to replace these when operations are resumed. We are still carefully watching the mining operations carried on in the neighbourhood of your property, and any opportunity which may offer to enable work to be restarted would be gladly taken advantage of. I regret, however, to have to add that for the moment I see no chance for the resumption of work in your mine. The accounts in your hands speak for themselves, but I should like to state that since the beginning of this year further savings in the administration expenses have been effected by again reducing the remuneration of the London secretary and Berlin and Paris agents. The London committee has agreed to waive its fees altogether for the time being, while those of your board have been reduced to a purely nominal figure. European shareholders having called our attention to the fact that at present they are asked to give their proxies for our annual meetings without having the opportunity of first studying the reports, balance sheets, etc., we have decided to remedy this complaint, which we admit is justified. We shall therefore call you together shortly for the purpose of altering our articles of association, to enable us to comply with this request.

The report and accounts were adopted.

The retiring directors, Messrs. J. Friedlander and M. G. Elkan, were re-elected.

Mr. Charles Stuart and Messrs. Diamond and English were appointed auditors.

GEDULD PROPRIETARY.

Improving Outlook.

The annual meeting of shareholders of the Geduld Proprietary Mines, Ltd., was held this week in the board-room Silesia Buildings. Mr. M. G. Elkan presided, and there were also present: Messrs. H. Neuhaus, G. Falcke, Clement Davies, Fritz Elkan, M. Rode, H. Daniel, and O. Heymann, with Mr. W. M. Tudhope, secretary, representing 268,263 shares, out of an issue of 750,000.

The Chairman, in moving the adoption of the report and financial statement, said that the total profit for the past year was £39,968 19s. 3d. The quantity of ore treated in 1910 was 127,510 tons; in 1911 this was increased to 138,660 tons, and, if it had not been for shortage of labour, this tonnage would have been even greater. The yield per ton treated had increased by 3s. 3d. to 26s. 9·1d.; against this, however, must be placed an advance in the working costs of 8d., raising them to 21s. 8·5d. This increase in working expenses was to a very considerable extent due to the higher cost of native labour. They would see from the consulting engineer's report that 607,300 tons were available by drives, raises and winzes on the reef, which footage shows an average lineal assay value of 3·18 dwts., reckoned over 44·2 inches, milling width. There are furthermore 190,590 tons of probable ore, indicated by 4,975 feet of development work on reef, and this footage shows an average lineal assay value of 9·08 dwts. over 42·6 inches. This combined tonnage stood in the books at £171,665 2s. 4d., or 4s. 3d. per ton, and, although the technical advisers were quite satisfied that the inclusion of the "probable" ore is justified, the Board had reduced the amount, by appropriating £40 000 from profit and loss account, to £131,655 2s. 4d., so that the developed tonnage now appeared in the books at a cost of 3s. 3·6d. per ton, or, eliminating the "probable" tonnage, at 4s. 4·01d. per ton.

MINING OPERATIONS.

The Chairman indicated the additions which had been made to mine equipment. Dealing with the mining operations, he pointed out that the development work amounted to 16.825 feet in all, being represented, as detailed in the manager's report, by shafts, drives, crosscuts, raises, winzes and a pump sump. This compared with 12.415 feet in 1910, and had it not been for the considerable delay in the delivery of the new compressor plant, or if they had had sufficient native labour, a larger footage could and would have been shown. In view of the considerable addition which has been made to the ore reserves, the question of increasing the capacity of the reduction plant was receiving the serious consideration of the engineers. The problem was being carefully studied in all its details, and plans are in course of preparation.

The report and accounts were adopted.

The appointment of Mr. F. R. Lynch as a director, in place of Mr. J. G. Hamilton, resigned, was confirmed.

Messrs. H. Strakosch and Fritz Elkan were re-elected directors.

Mr. Chas. Stuart and Messrs. Diamond and English were appointed auditors.

PRINCESS ESTATE.

The Position To-Day.

Labour Questions.

The ordinary general meeting of shareholders of the Princess Estate and Gold Mining Company, Ltd., was held this week in the board-room, Silesia Buildings. Mr. M. G. Elkan presided, and there were also present Messrs. H. Neuhaus, J. L. Kuhlmann, Gustav Sonn, J. H. Ryan, Clement Davies, H. W. Anderson, M. Rode, W. R. Crowhurst, H. Daniel, R. H. Graham, W. Anstey, E. Rothschild, with W. M. Tudhope, secretary, representing 283,650 shares out of an issue of 574,033.

The Chairman, in moving the adoption of the report and accounts, said that shareholders would remember that at the special general meetings held on the 2nd and 24th of March last year they sanctioned the acquisition of the adjoining properties held till then by the Norman Properties Syndicate, Ltd., Roodepoort Central Deep, Ltd., and West Roodepoort Deep, Ltd., thereby increasing the size of the property very considerably. It is estimated that the south reef remains intact in 514 of the claims and the main reef in 663 claims. That the old Roodepoort Central Deep shaft had at various times given trouble, had to be carefully watched and needed repairs, was known to the board, but it came as a great and very painful surprise early in July last that this shaft was in a dangerous condition and had to be put out of commission at once, as otherwise they would have run the risk not only of losing it altogether but also of the workmen being killed by accidents which were likely to happen at any moment. Advantage was taken of this stoppage to alter the headgear and the whole shaft arrangements, which were rather antiquated and not suited to hauling large quantities of ore. As these repairs and alterations involved an expenditure of about £22,000, which could not at all be foreseen, the financial estimates compiled at the time of the amalgamation were upset.

OTHER TROUBLES.

Important as it was, this had not been the only trouble met with. The occurrence nullified all previous estimates as to the time which would be occupied in getting the reconstructed plant into full working order, as during the six months, approximately, while the repairs were being effected—during which period all work in the Central Mine had to be stopped—the unskilled labour force was considerably reduced, and when this section was ready to receive its underground complement, there was such a pronounced shortage of Kaffirs on these fields that, try as they liked, they could not make any advance in the number in the employ of the company. However, he was very glad to be able to say that in this respect their troubles were nearly over. They had secured a fair number of natives and they were rapidly becoming efficient labourers. Provided that we could maintain the present strength of the labour force, he thought they would be able to struggle along, particularly in view of the following reason. The mines in the Roodepoort district have always been held to be totally unsuited for rock drills, but during the period of their great distress they resolved to give rock drills another trial. The results obtained so far on the mine are encouraging—indeed, he thought they could claim to have already proved that rock drills can be employed to advantage on the narrow Roodepoort reefs. Owing to the unholy competition among the various employers of unskilled labour, the cost thereof has been driven up by leaps and bounds, without, however, effecting the desired result, namely, inducing a satisfactory number of natives to seek work on these fields. He had not yet given up all hope that an agreement between the employers of unskilled labour will be arrived at, which will put a stop to this competition. Negotiations with this object in view had been proceeding for a long time, and so far, he was sorry to say, without any tangible result, but it was so generally recognised that the present state of affairs cannot continue much longer without leading to disaster that he had not yet lost hope of an agreement, giving satisfaction to everybody, being arrived at.

ORE RESERVES.

After a review of the mining operations during the year, the Chairman said that the payable ore reserves at the end of 1911 stood at 656,500 tons, of a value of 7.26 dwts. over a milling width of 27.4 inches. Of this quantity 544,500 tons were on the south reef, assaying 7.47 dwts. over 25.1 inches, while the balance of 112,000 tons were on the main reef assay 6.27 dwts. over 50.2 inches. In addition there were 44,300 tons fully developed, of a value of 10.05 dwts., but, being required to be left as shaft pillars, were not available at present. When the various units were amalgamated it was the intention to push on the development of the West and Norman sections, but, owing to the dearth of labour this policy had to be changed, and little work is so far being carried out there beyond keeping them clear of water. The re-arranged plant was now giving complete satisfaction. When it was started up in December it gave some trouble, as all new plants do, the absorption of gold by the plates and tube mills was greater and took much longer than had been anticipated—hence further disappointments were experienced. The funds provided at the time of the amalgamation had proved insufficient, for the reasons explained. Messrs. A. Goerz and Co., Ltd., came to their assistance, and at the end of the year had advanced the company £15,065, which amount had since been increased largely. They were paying 6 per cent. interest on the loan.

The remaining debentures outstanding—£6,460—would be redeemed on the 1st of July next. On the results obtained during the first six months of 1911, a dividend of 5 per cent. was declared in June last, and paid to shareholders early in August.

It was with genuine regret that he had to state that they were shortly losing the services of their manager, Mr. W. Morton Webb, who had resigned his position and intended to leave the country. Mr. Webb had only been with the company about eighteen months, and a most arduous and trying period this had been. The board had appointed Mr. P. von M. Anderson as his successor, and he would enter on his duties at the end of May.

Mr. Daniel asked the expenses of maintaining the London, Berlin, and Paris offices.

The Chairman was unable to supply the figures at the moment, but promised that they would be ascertained if required.

Mr. Daniel said he raised the question because, as a general rule, these agencies were too highly paid and did very little work.

The Chairman said he could assure Mr. Daniel that the agencies of the company were nothing like too highly paid. They were doing quite a lot of work.

The report and accounts were adopted.

The appointment of Messrs. Clement Davies, J. H. Ryan, and A. Brakhan to fill vacancies on the board was confirmed, and the retiring directors, Messrs. J. Friedlander and Gustav Sonn, were re-elected.

Messrs. C. L. Andersson and Co. and F. W. Diamond and English were appointed auditors.

MODDERFONTEIN DEEP LEVELS.

Excellent Progress.

The eleventh ordinary general meeting of shareholders in the Modderfontein Deep Levels, Limited, was held in the board-room, Silesia Buildings, during this week. Mr. H. Neuhaus presided, and there were also present Messrs. Emrys Evans, C.M.G., M. G. Elkan, Gordon Sandilands, F. R. Lynch, J. L. Kuhlmann, M. Rode, V. J. Ronketti, Gustav Sonn, H. Daniel, and E. Rothschild, with W. M. Tudhope, secretary, representing 167,181 shares out of an issue of 263,000.

The Chairman, in moving the adoption of the report and accounts, said: You will remember that work on your company's property was started in June, 1910, and that by the end of that year the No. 1 shaft had reached a depth of 231 feet, and No. 2 shaft a depth of 194 feet. I am very glad to say that since then good progress has been made all round. The surface equipment has been very nearly completed for the present, and will probably not need to be added to—except in unimportant details—until the development of the property has progressed very much further. The No. 1 shaft has been sunk at an average speed of nearly 150 feet per month, and at the end of last year had reached a depth of 1,949 feet. This rate of sinking had been more than maintained, and the depth yesterday was 2,423 feet. As you will observe from the consulting engineer's report, he maintains his estimate of the depth at which the reef should be struck to be round about 2,750 feet. Thanks, however, to the excellent speed of sinking, this depth should be attained a full six months earlier than was originally anticipated, or, in other words, within the next three months. Progress in the No. 2 shaft has not been quite so rapid, as at the end of the year it had only reached a depth of 1,622 feet, while the depth yesterday was 1,984 feet. Excellent progress is now being made. The difference between the depths of the two shafts is due to a considerable flow of water which was met with in No. 2 shaft, causing some delay in the sinking operations therein. Happily, however, the matter was not serious, the water was caught up very soon, and is now no hindrance to the work. This is to a considerable extent due to the method adopted in laying out the shafts. As you will remember, they are situated only one hundred feet apart. They have already been connected with each other at the depths of seven hundred and one thousand four hundred feet, and sufficient pumping plant has been provided. At present some 200,000 gallons are being pumped daily. Owing to these connections the speed of work has been increased, as the ventilation of the shafts has been much improved thereby.

SAVING IN COST.

If no untoward event happens, it seems likely that an amount of at least £15,000 will be saved as compared with the estimate of the cost of sinking the shafts to the reef, for, as appears from the report, the average cost of the footage sunk to the end of last year was only £20 15s. 9d. per foot, including the cost of timbering and pumping. The cash position of your company is a satisfactory one. On the 31st of December last there was a balance of cash and cash assets in hand, after deducting current liabilities, of £183,314 — an amount which should leave a surplus of at least £100,000 available for development after the Reef has been cut in both shafts. As to the prospects, I can only repeat what I stated a year ago, namely, that I think, in view of the developments on the surrounding properties, there is every hope of proving the existence of a large quantity of valuable ore in your block of claims. In order to meet the wishes of shareholders residing in Europe, your board has decided that the annual meetings of your company shall be held in future at a later date in the year, and thus give them an opportunity of perusing the reports and accounts before parting with their proxies. For this purpose it will be necessary to amend the articles of association, and the meeting to sanction this will be called at an early date. The only other remark I have to make is to express your board's appreciation of the good services rendered the company by your consulting engineer, Mr. W. McC. Cameron, and your manager, Mr. J. P. Hussey, to whom your best thanks are due.

The report and accounts were adopted.

The meeting confirmed the appointment of Mr. F. R. Lynch to fill the vacant seat on the board of directors. The retiring directors, Messrs. Emrys Evans and A. Brakhan, were reelected.

Mr. Charles Stuart and Messrs F. W. Diamond and English were reappointed auditors.

SOUTH AFRICAN GOLD MINES, LIMITED.

A Review of Holdings.

The annual general meeting of shareholders in the South African Gold Mines, Ltd., was held in the board-room, Jeppe Arcade, on Wednesday. Mr. Julius Jeppe, chairman of the company, presided. Among those present or represented by proxy were: Messrs. G. H. Abbott, F. Alder, Anglo-French Exploration Company, Ltd., Sir Abe Bailey, K.C.M.G., Leo Bergman, Sir William St. John Carr, T. Cooper, J. G. Currey, Deutsche Bank, C. G. Fuller, P. Greathead, G. Hanbury, A. L. Juckes, E. J. King, S. L. Lazarus, A. S. MacMurray, A. Marc, John Mee, Sir Alf. Newton, Bart., James Pegler, G. H. Rennie, August Ries, J. H. Ryan, Colonel Sir Aubrey Woolls-Sampson, K.C.B., M.L.A., J. Schofield, R. O. Schwarz, Bailey Southwell, P. C. Tomson, Major A. H H. Wilson, H. Winstanley, W. A. Young, F. C. Chapman, and O. F. Brotherton, secretary; representing in all 43,593 shares, out of a total issued capital of 179,324 shares.

Chairman's Speech.

The Chairman said: Before formally moving the adoption of the directors' report and accounts, I should like to give you a short resume of the operations of the year as disclosed in the accounts. First, as regards the balance sheet, you will notice the capital account remains the same as last year—namely, £179,324. Debenture issue now figures at £149,000; £30,000 worth of debentures having been purchased at a profit during the year. Since the closing of the annual accounts we have purchased more debentures, also at a profit, and your directors propose to continue this policy as opportunity occurs. Share premium account at £25,324 is exactly the same as last year. Sundry creditors is practically the same as before, the bulk of this being for interest on debentures which is not payable until the day after the closing of the year's accounts. Loans is also practically the same as in the previous year, these being, as you are aware, amounts placed on depoist with you by your subsidiary companies. Contingent liabilities is £10,603 17s. 9d. more than in last year's accounts, the increase being due to our having subscribed for, but not yet paid over, a portion of the new working capital issue of the Van Ryn Deep, Limited. The balance of the account represents uncalled capital on shares in one of your subsidiary companies. On the credit side of the balance sheet you will notice that claims and mining ventures, which stands at £40,061 14s., shows an increase of £156 5s. The license money paid for claims under this heading has been added to last year's account. The sum of £1,045 9s. 6d. has been deducted for an interest abandoned. Farms stands as before, and the item shares on hand shows a decrease of £17,273 9s. 2d., the total amount to the credit of this item being at the close of the year £325,573 7s. 7d. This decrease is the net balance resulting from sales and purchases of stock during the year, plus the amount (£8,655 6s. 4d.) written off your holdings for depreciation, in order to bring them down to market prices on the 31st of December. This depreciation will, it is hoped, be of a temporary nature only. I may add that the real total value of your shareholdings, taking the market price ruling on the 31st of December last, and the cost price of such shares as were not quoted then, amounts to £410,601. Sundry debtors shows an increase of £171 18s., and is represented by dividends declared, but not yet paid at the end of the year, money due to the company for the sale of interest in claims, and money owing on the shares. All these amounts are fully secured. Cash account at £10,981 4s. 7d. is an increase of £10,704 1s. 5d., due principally to the sale of shares during the year. This cash is on loan at call or on fixed deposit at fair rates of interest.

PROFIT AND LOSS.

Now, coming to the profit and loss account, we find at the beginning that the establishment charges at £3,758 1s. 3d. for the year have been increased by £1,448 4s. 10d. As a matter of fact, the administration charges have been decreased in most instances, but the British income tax is this year about £33 more than last year, the other addition being legal expenses, which have been increased from £93 12s. 5d. to £231 1s. 2d., due, I regret to say, to an oversight in last year's account. An amount of one hundred guineas for legal retainer in London should have been debited in the 1910 accounts, but this was omitted, and therefore the present account shows two years' fees instead of one, and then we come to the item of discount and interest, £1,477 16s. 2d., which did not appear last year. You will remember that I said at the last general meeting that towards the end of 1910 we utilised a large sum at our disposal, and which had been earning interest, for the purchase of our own debentures, and, as already stated, we have done the same this year, and we have therefore, had no large sums earning interest; this is reflected in the item of debenture interest, which you will notice has been decreased from £14,741 9s. 11d. last year to £8,950 this year. As already stated, we have written off the sum of £8,685 6s. 4d. depreciation in shares, which really does represent only depreciation, as no direct losses in this item were incurred during the year; on the other hand, we have written off £3,775 17s. 9d. for direct losses in mining ventures.

SATISFACTORY CREDIT.

Now, turning to the credit side, we find that whereas last year we showed an amount of £1,242 3s. earned in interest on investments, this item has disappeared in the current year's account, for the reason I have just mentioned. We show, however, against this a profit on sale of shares of £34,409 4s. 10d. Rents are reduced by a few pounds, and then there is a profit of £750 made on debentures purchased; and the last item, "Dividends received, £14,873 3s. 10d.," shows a decrease of £3,297 8s. 2d., due to the sale of some of our dividend-bearing shares, as well as a decrease in the rate of dividends received; and we go forward, gentlemen, to next year with a satisfactory credit to profit and loss account of £24,871 8s. 9d., after having written off all losses and made ample provision for depreciations, reducing the debit standing to the profit and loss account itself to £46,626 3s. This, gentlemen, concludes my review of the accounts now in your hands, and I venture to think that the result of the year's work will be considered eminently satisfactory. It is true that a depreciation has taken place in the market value of some of your holdings, it is further true that the companies from which I had every right to predict receipts of dividends when I last met you, have, for various reasons, disappointed us; but, in spite of all that the pleasing fact does remain that, after making ample provision for all possible depreciation and losses, we have reduced our liabilities by £31,112 (leaving out shilings and pence), while decreasing the book value of our assets by only £6,241.

OVERSEA SUGGESTION.

Your directors have carefuly considered the suggestion made by some Oversea shareholders that we should publish with our report a detailed list of our shareholding, but we have come to the conclusion that such a course would be detrimental to the interests of shareholders. A list of our holding is placed on the table to-day for the inspection of local shareholders, and a copy of it is sent to our London office for the same purpose, but it would be unwise to publish to the world at large the nature of our interests or the transactions entered into. On the other hand, your directors have decided to issue their report, together with the balance sheet, etc., to all shareholders, and to hold the annual general meeting at such a date as will give European shareholders sufficient time to send out proxies after they have had the opportunity to study the report and accounts. I now beg to move that the report and accounts for the year ended the 31st of December, 1911, be adopted.

The report and balance sheet were adopted unanimously.

With regard to the election of directors, the Chairman announced that Sir Aubrey Woolls-Sampson did not offer himself for re-election. Sir Abe Bailey and Messrs. Julius Jeppe and J. H. Ryan were re-elected, and the auditors, Messrs. C. L. Andersson and Company and J. P. Ablett, were reappointed.

The meeting then terminated.

WIT. TOWNSHIP.

Investments Reviewed.

The twelfth ordinary general meeting of shareholders of the Witwatersrand Township, Estate and Finance Corporation, Ltd., was held Wednesday in the offices of the corporation, Jeppe Arcade, Mr. Julius Jeppe presiding.

The Chairman, in moving the adoption of the report, said: Capital and share premium accounts are exactly the same as before. Sundry creditors shows, however, a decrease of £1,280 7s. 4d., being sums due at the end of the year in the usual course of business. Deposits shows an increase of £672 16s. 3d., the total amount at the 31st December being £23,204 12s. 3d. This sum is composed of various amounts deposited with us at short call by other companies. Turning to the credit side of the balance sheet we find that property account, which stands at £230,021 12s. 11d., shows a slight decrease of £559 9s. 7d., this being the net balance of sales and purchases during the year, the only purchase made being the freehold of the township of Lorentzville, in which you hold a half interest. This township, as you are aware, has previously been held only in leasehold. Houses and the Jeppe Arcade is less than last year by £222 4s. 9d., the total amount of this asset standing at £81,685 11s. 11d. During the year, we increased our investment in house property by £6,133 6s. 4d., mainly caused by our taking over houses bonded to us; but before closing the books for the year we wrote off for depreciation on all our houses and the Arcade a sum of £6,355 11s. 1d. to bring the amount in line with the conservative valuation put on them by our architect. The next item, stands unsold, at £50,497 13s. 4d., shows only a very slight variation. Investments in property, which shows a total of £46,977 10s. 2d., is less than last year by £2,276 0s. 5d. This is practically the amount by which we have this year written down our properties. Investments in shares stands at £90,880 4s. 9d., after deducting £1,787 2s. 6d. for depreciation. The only share transaction made during the year by your directors was the purchase of 10,000 Malvern shares at a satisfactory price; naturally, this £90,880 does not represent the real value of your shares. Some of them have been written down to bring them into line with the market prices ruling on the 31st December last. Others have been taken in at cost (where such cost was below market value), but no account has been taken of the appreciation in any of them.

PRETORIA TOWNSHIP, LTD.

With regard to the Pretoria Townships, Ltd., I have no hesitation in saying that the intrinsic value of your shareholding in that company is at least £25,000 more than the figure at which it stands in your books. Then I must mention the 128,630 shares we hold in the Malvern Estates, Ltd., and which figure in our books at 3s. 10d. each. I would like to tell you that although this suburb has made important strides during the year under review, about 200 houses having been built on it in that period, and £26.000 worth of stands having been sold by us, the present capital of the company prevents all chance of paying a dividend for many years to come. Sundry debtors shows a gratifying reduction from £11,561 8s. 9d. last year to £7,667 16s. 4d. this year. Bonds, loans, etc., at £65,729 10s. 5d., shows a reduction of £4,129 11s. 1d. In accordance with our practice, we have written off a sum of £1,530 15s. 9d. to bring the amounts of certain bonds down to the level of the valuation by our architect of the properties on which they are secured. The total expenditure shows an increase of £822 19s. 5d., this amount being spread over the items of salaries, rates and taxes and auditors' fees. On the other side of the account we find an increase in licenses, rents, etc., of £1,905 0s. 7d., principally due to an increase in house and office rents and to a profit made by the purchase of a freehold interest in a township and the re-sale of a portion of such interest. This increase, however, was more than counterbalanced by a shortfall in the yield of profit from all other sources by an amount of £3,950 19s. 8d., £3.000 of which is due to the fact that in the previous year we credited this account, as I then told you, with half the purchase price of the Carlswald timber, a transaction which has not been repeated this year; and in addition to this there is a reduction of £772 in fees received for secretarial duties and services, the actual amount received under the heading of profit from all other sources this year being £4,291 11s. 1d. and the total receipts on the credit side of the profit and loss account being £36,759 4s. 5d., leaving a balance to be carried foward to appropriation account of £20.087 8s. 4d., or £2,878 18s. 6d. less than last year, which is practically the amount which last year we took in as profit on the sale of the plantation of Carlswald. The appropriation account, which stood at £143.265 16s. 6d. last year, now stands at £151.537 1s. 4d., or an increase of £8,271 4s. 10d. As pointed out to you in reviewing the balance sheet, your directors thought it advisable to write off several large sums for depreciation, amounting in all to £12,085 2s. 10d. This sum is much larger than last year when we only wrote off £5.401 1s. 1d., and consequently the actual increase in your appropriation account is so much the less.

The appointment of Mr. Emrys Evans, C.M.G., as a director of the company was confirmed.

Mr. J. H. Ryan was re-elected to the directorate.

Mr. L. B. Chesterton and Messrs. C. L. Andersson and Co. were reappointed auditors.

Some remarks by Mr. Jeppe on the question of freehold will be found in another column.

DIEPKLOOF MYNPACHT, CLAIM AND ESTATE.

The ninth annual general meeting of shareholders of the Diepkloof Mynpacht, Claim and Estate Company, Ltd., was held in the board-room, Jeppe Arcade, on Wednesday, at 10.30 a.m., Mr. Julius Jeppe, the chairman of the company, presiding. 184,025 shares were represented out of an issued capital of £242,500.

The directors' report and accounts for the year ended the 31st of December, 1911, showing an available cash balance of £3,808 6s. 9d., were duly adopted; the retiring directors, Sir George Albu, Bart., and Mr. J. H. Ryan, were re-elected; Mr. Henry Hains was reappointed auditor, and voted a remuneration of ten guineas for the last audit.

SIMMER EAST DEEP.

The ninth annual general meeting of shareholders of the Simmer East Deep, Ltd., was held in the board-room, Jeppe Arcade, on Wednesday, at 10.20 a.m., Mr. Julius Jeppe, the chairman of the company, presiding. 434,280 shares were represented out of an issued capital of £450,000.

The directors' report and accounts for the year ended the 31st of December, 1911, and showing an available cash balance of £34,189 17s. 3d., were duly adopted; the retiring directors, Sir Abe Bailey, K.C.M.G., and Mr. Julius Jeppe, were re-elected; Mr. S. Fleischer was reappointed auditor, and voted a remuneration of fifteen guineas for the last audit.

SOUTH FRENCH RAND.

The eighth annual general meeting of shareholders of the South French Rand, Ltd., was held in the board-room, the Jeppe Arcade, this week, Mr. Julius Jeppe, the chairman of the company, presiding. There were 191,376 shares represented out of an issued capital of £229,650.

The directors' report and accounts for the year ended the 31st of December, 1911, showing an available cash balance of £51,938 5s. 8d., were duly adopted. The retiring directors, Sir Abe Bailey, K.C.M.G., and Mr. Julius Jeppe, were re-elected. Messrs. C. L. Andersson and Co. were reappointed auditors, and voted a remuneration of fifteen guineas for the last audit.

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Notes and News.

Van Ryn Deep. The Van Ryn Deep is to be equipped with a Butters vacuum filter plant, with a capacity of 1,000 tons slime per day.

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The Butters-Moore Litigation. It is gratifying to learn that the Butters-Moore litigation in connection with the patent rights of the stationary vacuum filter process has been satisfactorily adjudicated upon, if only for the sake of those who have entered upon large capital expenditure in the installation of these plants. The Butters Company has, of course, always given a guarantee against damage in this connection, but the possibility of disputes is nevertheless undesirable. The litigation has been hanging on for about three years, and during this time the Butters Company have installed no less than 120 plants in almost every part of the world, the number erected by the opposing company being, we understand, about three. There is the chance of an appeal, no doubt, and the possibility that the Moore interest may reopen the struggle in another country, but in view of the somewhat definite and apparently unassailable judgment recently given, the inducement to continue the fight does not appear particularly encouraging.

* * * *

S.A. Bills. It is announced that the National Bank of South Africa and the London County and Westminster Bank have placed an issue of £2,000,000 of Union Government of South Africa Treasury Bills. The Bills, which will have a currency of twelve months, will replace a similar amount of bills borrowed nine months ago and falling due on April 1. The price of issue is understood to be 96¼ per cent.

* * * *

The New Alluvial Tin Venture. Regarding the Alluvial Tin Fields of Africa, Ltd., which has been formed, with a capital of £100,000 in £1 shares, to take over the Kuils River Tin Mines, Mr. Osborne, of Messrs. Osborne & Chappell, the well-known firm of engineers of the Malay States, who has examined the properties, estimates that from only 52 acres a profit of £235,070 will be obtained. The vendors undertake to procure subscriptions for 50,000 shares at par, which would provide the company with £20,000 working capital; and Mr. Osborne estimates that the plant can be installed, including working costs for three months and salaries, for £15,755. The company is under the control of directors who are on the boards of some of the chief Malay tin enterprises.

* * * *

Village Deep Progress. The Village Deep continues to make satisfactory progress, and the ore crushed last month—51,000 tons—constitutes a record for this company. The profit for January was £22,535, and for February, £22,083, and it looks as if these earnings were at the least to be maintained for some time to come. It is important to note that the high angle of dip of reef in the lowest workings of the property is being maintained. This geological feature and its significance were commented upon at length in a recent issue. The Hardinge conical tube mill is now running, but it is too early as yet to speak of results.

* * * *

A New "T.C.L." Flotation. According to the annual report of the T.C.L., there is every prospect of the Fairview Gold Claims becoming a profitable mine. The option over this ground has, since the close of the year, been exercised by the flotation of a company called the "Fairview (T.C.L.), Limited," which has been registered with a capital of £45,000 in 45,000 shares of £1 each, consisting of 30,000 vendors' shares and 15,000 working capital shares. The claimholders receive 10,000 of the vendors' shares as purchase consideration for the claims, the remaining 20,000 vendors' shares being divided between this company and the African Farms, Limited, in the proportions of 75 per cent. and 25 per cent. respectively, the two companies undertaking to subscribe the £15,000 working capital in the same proportions. The T.C.L. Company's total holding in the Fairview (T.C.L.), Limited, is therefore 26,250 shares, equal to 58⅓ per cent. of the capital.

* * * *

West Rand Central Gold Mining.

Dividends of 10 per cent. for 1903-4 and 7½ per cent. for 1904-5 were paid by the West Rand Central, of which Mr. M. W. Colchester-Wemyss, J.P., is chairman, since when the shareholders have had to go without. Formed in 1897, the company owns 66 claims, of which about 38 are reef claims and 28 north of the reef. A 20-stamp mill and cyanide plant commenced work in 1898, and a slimes plant in December, 1906. A tube mill was erected in 1907. The report of the directors for the year ended 30th September last, presented at the meeting on the 14th ultimo, states that during the past year 32,360 tons of ore have been treated by amalgamation, cyaniding and the slimes process, for 12,038 ozs. of fine gold, realising £52,247, as compared with 11,983 ozs., realising £51,065, the previous year. The profit amounted to £6,454, as compared with £4,918, the increase being again mainly due to an improvement in the value of the ore treated. After writing 10 per cent. off machinery and plant, namely, £2,190, the directors recommend that the balance of profit be carried forward. Shortness of native labour and the frequent recurrence of faults in the reef have retarded the development of the mine and the extraction of ore for the mill, the latter working 279¼ days during the period covered by these accounts, as compared with 305½ days in the preceding year. The manager reports that as the natives are now coming in freely he expects soon to have the full complement made up, and does not anticipate any serious falling off in the supply of labour during the coming winter. If such should be the case, the development of the mine may in the future be expected to proceed more rapidly. For the reasons above stated, the number of tons of ore crushed has been 4,243 tons less than in the preceding year, but as the value of the ore has been higher the receipts therefrom show an increase of £1,182. The west shaft, which at the date of the last report was approaching the 13th level, has now reached the 15th level, and driving east and west thereon is proceeding. The authorised capital is £100,000 in shares of £1 each, all of which are issued and fully paid.

* * * *

Buffelsdoorn Earning Profits Again.

It may have been observed that in the February and January statements of production and profit earning for the mines of the Barnato group, the Quest G.M. and D. Company records a small but noteworthy profit. Thirty stamps are at work, and these in January milled 2,281 tons for a revenue of £2,237 and a working profit amounting to £472. In February a profit of £662 and an output of £2,659 were declared on a basis of 2,231 tons milled. The yield is but little more than a guinea per ton, so that working costs rule at a creditably low figure. As the majority of our readers are doubtless aware, the Quest is a resuscitation of the Buffelsdoorn properties in the Klerksdorp district. In the pre-war days the Buffelsdoorn was thought a great deal of, so much so, indeed, that 170 stamps and extensive cyanide plant were erected there.

* * * *

The Vogel Deep's Position.

The Vogelstruis Consolidated Deep, possessed of an efficient and modern equipment and a large block of ground in the near western portion of the Witwatersrand, remains idle, and from the last report of the directors and the statement made by Mr. Dawe at the meeting held the other day, there appears to be no immediate prospect of anything being done with the company's ground. There are very few, if any, other mines on the Witwatersrand which have had to suspend operations because of inability to earn a profit after several months' crushing, but the Vogel Deep has proved a notable exception to the average of the conglomerates of the Main Reef series over a great length of strike. It will be remembered that a provisional agreement was entered into with a representative of the Roodepoort United Main Reef Gold Mining Company, Ltd., by which the Vogel Deep Company agreed to sell to the Roodepoort United Company, as and from the 15th June, 1911, all its claims, plant and undertaking. The directors, however, regret to report that the representative of the Roodepoort United Company subsequently notified the Board that he has been unable to carry the matter through with the Roodepoort United Company. At the meeting held the other day, Mr. Dawe stated that the purchase consideration proposed was one share in the Roodepoort United for each block of ten shares in the Vogelstruis Consolidated Deep, it being further agreed on the part of the debenture holders that they would accept 82½ per cent. for their debentures with accrued interest thereon. Mr. Dawe remarked that the directors were pleased at the prospect of being in a position to submit a scheme for the shareholders' approval which would have given them an interest in a profit-earning company. He afterwards touched on the advisability of putting the company into liquidation, but remarked, "in any case, that question could not be dealt with at this meeting, and the views of the debenture holders should be obtained." The balance sheet shows that, to date, there has been expenditure at the mine amounting to £91,723 in respect of buildings, machinery and plant, £91,943 on shafts, and £93,596 on mine development.

* * * *

The Burdens of the Industry.

Few people probably realise what a much increased burden the Witwatersrand gold mining industry has now to carry in the shape of new regulations and their attendant costs. At first sight the printing and posting up of new canvas regulations at the several shaft stations and pitheads of a mine does not signify any appreciable expenditure. But when reflected over the whole industry such matters do cut a very material figure indeed. Add to this the numerous accessories in the shape of ambulance boxes at shaft stations, etc., buckets of drinking water, etc., at each level, and it should become evident that the new scheme of things on the Rand imposes severe additional expense when all these items are considered in the aggregate. Of course all this tends to better underground conditions and benefit efficiency. The mines by no means begrudge such expenditure, but the point we wish to make is that such expense is almost entirely lost sight of by the average critic of Rand mining economics. A few visits to some of the largest mines along the reef would quickly result in a more fitting sense of the importance of these items in the aggregate.

* * * *

Camp Bird and Messina.

We learn that the Camp Bird Co. has recently been given an opportunity of acquiring a substantial interest in the Messina (Transvaal) Development Co., Ltd., and has agreed to guarantee the interest for five years on an issue of £350,000 six per cent. debenture stock to be made by the latter company. The debenture stock will be issued at 95 per cent., and every subscriber who receives an allotment of the debenture stock now offered will, upon paying up his stock in full, receive an option certificate entitling the holder to subscribe at any time before March 1st, 1915, for one share in the capital of the Messina Co. at 22s. 6d. per share (the present market price) in respect of each £2 of debenture stock allotted to him.

* * * *

Union Iron and Steel Works.

Some samples of iron and steel bars produced at the Union Iron and Steel Works, Dunswart, Benoni, which have been exhibited to us, show that the company is making a useful and reliable class of goods which will safely bear comparison with imported products of the same kind. The scrap purchased by the works is taken by contract, we understand, from the Rand Mines Group and other leading mines, and the terms of the contracts provide for the absorption of the various kinds of bar made at Dunswart. A large quantity of bars for tube mill lining purposes is turned out and sold to the mines, and another saleable commodity is rails up to about 20 lbs. per foot in weight.

An Engineer's Opinion. Mr. Arthur E. Pettit, M.I.M.M., A.M.I.M.E., writing from London, says: "It is so long since I have been in South Africa that I do not feel justified in discussing the mining and metallurgy practices in vogue at the present day. However, from the various reports and maps I have seen lately, it appears that the practice of mining of unpayable ore to keep the mill running is still more or less in vogue, and I should like to say that in my opinion the mining of unpayable ore is only justified when the ulterior motive warrants such a course, and is never justified for the sole reason of keeping the mill running."

* * * *

Rand Gold and the Strike. That Johannesburg is responsible for the great strikes of the past few years is the suggestion to which currency is given by Professor Ashley, of the Faculty of Commerce of the University of Birmingham. Professor Ashley points out that in the past fifteen years wholesale prices have risen by about 24 per cent., and retail prices by a somewhat smaller figure—in other words, that what cost a sovereign in 1896 can now only be purchased for twenty-five shillings. Hence, bread and meat and other household necessities having gone up, out of proportion to the increase of wages, the position of the ordinary worker is worse to-day than it was years ago. What is the cause of this state of affairs and the consequent unrest? asks Professor Ashley, and the answer is the enormous growth of the output of gold. Between 1890 and 1897 the world's output of gold doubled. Between 1897 and 1911 it doubled again. In 21 years it has quadrupled, and the Rand has been the main factor in the increase. Professor Ashley declares that the expansion of the output of gold sends up the cost of living "by adding to the gold reserves of the banks. This enables them to lend on easier terms; and this again by encouraging enterprise, leads to a greater demand for commodities and to a rise of prices. It must, of course, be borne in mind that the actual medium of circulation in the business of this country is coming to be more and more the cheque. The whole mass of currency, in the widest sense, including cheques and bills, as well as the relatively insignificant quantity of notes, rests, however, on the basis of the available gold. . . . High prices may go along with national prosperity, and low prices with general depression. It may be better to have abundant and well-paid employment with general high prices, than scanty and ill-paid employment with general low prices. . . Higher prices are both a cause and a result of growing prosperity."

* * * *

New Rand, Limited. At the special meeting of London shareholders in the New Rand, Limited, held recently, the history of what is familiarly known as "Sawyer's theory" was interestingly summarised by Colonel Heath, who presided over the proceedings. "Few of the general public," said the Chairman, "and probably of the shareholders themselves, fully realise the importance and scope of Mr. Sawyer's enterprise. The company are not concerned in the opening up of a gold mine. Theirs is a much larger conception. What they are considering is nothing short of the discovery of a goldfield—the opening up, in fact, of 'a new Rand,' as the name of the company implies," and so on. So confident was the meeting in the ultimate success of Mr. Sawyer's efforts that a resolution was unanimously carried requesting the London Committee of the company "to make such arrangements as may be found desirable in order to obtain subscriptions for shares to the extent of the total authorised capital of the company." In this way means will be provided for the continuance of the sinking operations. The sixteenth borehole at present has reached a good depth. Meanwhile, operations are costing the company very little. Colonel Heath explained that beyond the cost of sinking, there were no expenses at all worth speaking about, while only one drill is at work.

TOPICS OF THE WEEK.

SOME OBJECTIONS TO THE MINERS' PHTHISIS BILL.

The Miners' Phthisis Compensation Bill, published during the week, is substantially on the lines anticipated in our last issue. A Compensation Fund and Board are to be constituted, to which the mines must pay each month £6 for each rock-drill miner employed and £3 for every other underground employee. A quarter of these sums is to be deducted by the mines from the wages of the men. Assuming that 11,400 is the average number employed each month, of whom 2,334 are rock-drill men, and the balance are employed in other occupations underground, the sum payable by the mines is, roughly, half a million sterling per annum, of which one quarter is payable by the men. This works out at approximately fivepence per ton of ore crushed, or, as we said last week, a direct impost on the mines alone of 3d. per ton crushed, taking the month of January as typical. Men wholly incapacitated for work by phthisis will be given a pension of £8 per month indefinitely, those partially incapacitated will be allowed £8 per month for a year, and generous provision is also made for the widows and orphans of victims. These, very briefly are the salient figures of the scheme. It will be seen that in framing it, the Government has been animated by the same bold spirit of generosity at other people's expense which has come to be characteristic of its financial proposals. The Government can always be relied upon to "spend like a gentleman" when it can make someone else foot the bill.

Boiled down, the whole thing is simply that rich mines and poor mines, big wage-earners and small alike are to pour money into a Government-controlled fund, which is to dole out, with more or less lavish hand, pensions to the phthisical miners. The objections to such a scheme are many and obvious. Day's-pay men and contractors, big wage men and small cannot fairly be asked to contribute the same proportion to such a fund. Again the mines that have spent and are spending money lavishly to fight the dust creator of phthisis are to be penalised equally with the mines where nothing at all is done in that direction. This is a fatal flaw in the scheme, because it carries the cumulative defect of setting a premium on letting things slide, and offers no inducement to individual mines to combat the phthisis evil. If the mines are to be forced to go on pouring money into a Government fund, irrespective of their own efforts to reduce the evil, obviously the valuable economic stimulus to amelioration of underground conditions will be lacking. The summaries of the Bill certainly contain a vague reference to the allocation of any surplus after the objects of the Fund have been attained. But the reference is far from explicit, and promises little beyond the fact that the disposal of such surplus will be carefully considered by the Government, but we all know that the Treasurer has a short way with surpluses. If Mr. Kotze can suggest to the Minister of Mines no better or more direct means than this of encouraging the mines to stamp out the evil, we fear his anticipation of eradicating it in three years is hardly likely to be realised.

The hasty drafting, which is no doubt responsible for this, to our mind, fatal defect in the Bill, if it is at all to be considered a remedial measure, cannot be considered to blame for the evasion of the State's responsibilities under it. In this the hand of a cynical despotism is clearly seen. British, German, and Australian precedents are lightly set at nought, and the Government proposes to show the world how capital and labour are to be set by the ears, what time the State, which draws 90 per cent. of its revenue from the production of both, goes neutral and scot-free of any contribution. Public money is voted in hundreds of thousands every year to help the farmers destroy tick and scab, and codlin moth, but the stricken miner, who, like Atlas, carries the whole Sub-continent on his back, is denied the smallest contribution from an overflowing Treasury. "You and your employers," says the Government curtly, "can make your own insurance funds—England and Germany and Australia may contribute from State funds—but South Africa is not like one of these, and you are—outcasts!" Apparently, the Government refuses to credit the report of the Medical Commission, which dwells on the large proportion of the miners who are South African born, and on the permanency that now characterises the miners as a class. The present Bill still treats them as birds-of-passage, who have no claim on the State, though its coffers are filled with the fruits of their labour. Nor must we omit the objection to the Bill based on the fact that for some of the smaller and low-grade mines it may prove the last straw. It was inevitable that a bill framed on such sweeping and ambitious lines should omit to provide for such trifles. It may be that such obvious shortcomings will expedite the Bill to the Select Committee stage and keep it there till hammered into more practicable form. The intention of the measure, of course, is good. It means well. But it must undergo a rigid pruning and drastic improvement before it can be considered acceptable by either mines or men.

MINING AND PUBLIC FINANCE.

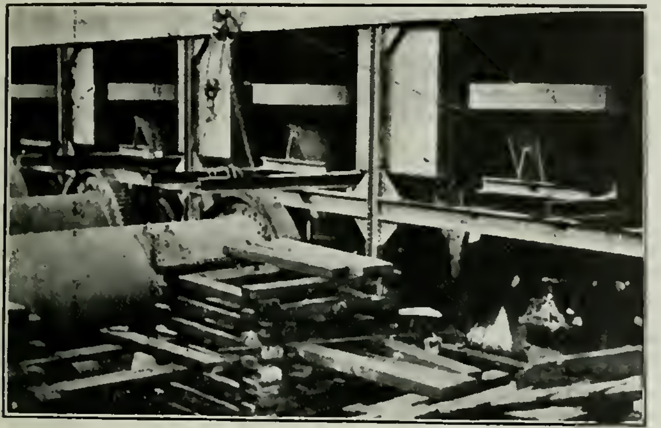
THE new Phthisis Bill is far from being the sole evidence of the unsympathetic attitude of the Government, as revealed in its actions towards the mining industry. In almost every debate of the past ten days, it has been made clear that little is to be expected from a Ministry that has long ago made up its mind that the sole function of the industry is to be the milch cow of the country. In Mr. Hull's Budget and estate duty proposals, in Mr. Sauer's railway finance, in the Government's airy treatment of the bewaarplaatsen question, this spirit is seen, and the only good feature of the situation is the outspoken condemnation of these proposals by Sir Lionel Phillips and Mr. F. D. P. Chaplin and Mr. Walton. We need not here follow in detail their analyses of Mr. Hull's finance. Suffice it that all are agreed in deploring its unjustifiable optimism, its extravagance and its lack of foresight. In details of his proposals, such as the estate duty and bewaarplaatsen questions, Mr. Hull appears at his worst and crudest, and his methods assume their most dangerous form. Bewaarplaatsen are, of course, reserved places, and in Rand signification denote pieces of ground which in the early mining days were applied for by the mining companies for battery sites, houses, depositing places for tailings, water-rights and other purposes. A Transvaal Act of 1908 provided for the leasing, mining or other disposal of the bewaarplaatsen; and in 1909 a Commission was appointed to enquire and report whether any share of the proceeds derived from the utilisation of the bewaarplaatsen, in accordance with the provisions of the Act of 1908, "should be paid to any class of persons, and, if so, to what class or classes and in what proportion." The Commission consisted of Mr. Ewald Esselen, Mr. Justice Gregorowski, and Mr. H. C. Fleischer. The Commission's report clearly sets down in the concluding paragraph that "registered owners of freehold" in the bewaarplaatsen, of whom at that time there were seventeen, are entitled to receive 50 per cent. of the moneys accruing to the Crown in this connection. So far as the other half is concerned, the Act of 1908 seems to intend in Section 53 that the sums accruing to the Treasurer shall be devoted to the extinction of debt, if the mining is carried on by Government, and shall be paid into a special fund, pending the direction of Parliament, if derived from the lease, or other disposal, of bewaarplaatsen rights to other people. According to Sir Lionel Phillips, however, the freehold owners have not received a penny, while Mr. Hull is stated to have simply included the entire proceeds up to date—£111,176—in his estimates of general revenue. Even from the point of view of the actual amount involved, this is not a trifling matter; for the capital value of the bewaarplaatsen rights is put by Sir Lionel Phillips at something under two millions sterling, an estimate which does not greatly differ from that of Mr. W. Bleloch, who in his work entitled "The New South Africa" puts the value at £1,750,000. The principle involved is, obviously, of much greater importance than the cash, and Mr. Hull's reply is awaited with much concern by the whole industry and all who are jealous of the credit of the country.

The estate duty question is of scarcely less importance. Briefly, Mr. Hull's proposals are, under the pretence of consolidating the estate and succession duties, to augment the revenue from these sources. In reality he comes forward with a triple tax—(a) a graduated estate duty, payable to the State by the executor at the owner's death; (b) a graduated tax on settled estates, which the heirs or legatees pay; and (3) a fixed duty of 5 per cent. on all shares held by non-residents in companies which trade in South Africa. The graduated duty begins on estates of the value of £500, and rises to a maximum of 10 per cent. on estates of £100,000 and upwards. By the fixed duty on shareholdings, Mr. Hull expects to tax those persons who make money out of South Africa without living in the country. In the debate, Mr. Chaplin showed the Treasurer that the takings he was likely to get out of his absentee shareholders' death duties would be a poor compensation for the business which he was likely thereby to drive away from South Africa. According to his scheme any company which does any business in South Africa, even if it does most of its business elsewhere, must, when a shareholder on its list dies outside South Africa, pay over to the Union Treasury 5 per cent. of the market value of that shareholder's interest. The result will too probably be that many of these companies will prefer to cut their South African business. Then the "bearer" shareholders cannot possibly be got at. It is, of course, possible to prohibit bearer shares in this country, and thus send away still more business. Sir Lionel Phillips, who spoke after Mr. Chaplin, emphasised the injustice and foolishness of this tax. In view of the anti-industrial tenor of these proposals, we cannot do better than repeat the considered warning contained in the report of the West Australian Phthisis Commission—the product of a body appointed by a Labour Ministry. "It is too much the fashion," say the Commissioners, "to assume that gold mines can stand anything in the way of exaction. This is far from being the case. The industry is in reality a very speculative and precarious one, and from time to time the investing public gets tired of it. The margin between profit and loss is often extremely narrow, and any undue disturbances would in such cases lead to liquidation for the owners and loss of employment for the working miners, and, which is even more serious, prospectors with new mines to develop would look in vain for the assistance of capital. Many mines have existed for years and achieved nothing beyond the regular payment of wages; not only have they received no interest on the expenditure of capital, but the capital itself has been swallowed up. The only attraction of mining for the speculative capitalist lies in the occasional prizes, which, after all, bear only a small proportion to the blanks. . . . A light-hearted and indiscriminate ordering of expensive machinery for ventilation, or any other purpose, might cripple all but the richest of mines, and would be the death-knell of a great many that have not yet reached—if they ever will reach—the productive stage." It is earnestly to be hoped that these words will be pondered by our legislators—now in danger of legislating the mining industry to death—before it is too late.

ROBINSON DEEP NEW PLANT.

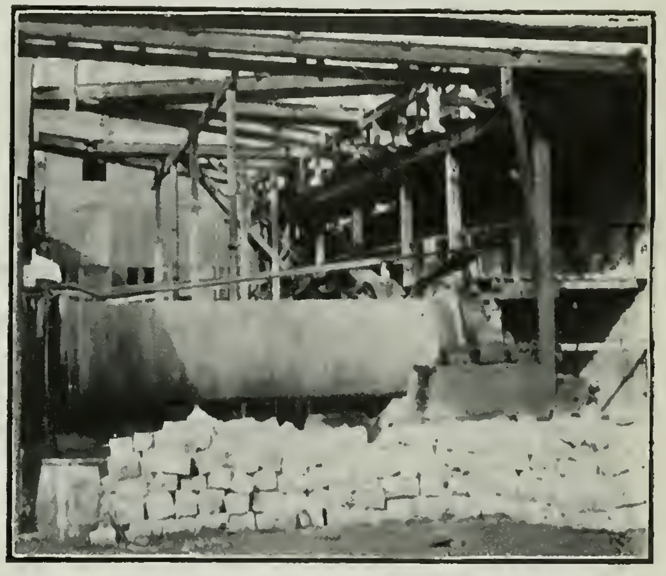
Enlarged Slimes Treatment Scheme—Five Additional Tube Mills—Mill Capacity to be 2,000 Tons per Day.

Although the Robinson Deep mill is situated directly on the main road to town from the southern suburbs, there are probably few who are aware that some important construction work has been in progress within a stone's-throw of the tram line. The mill has been undergoing a reconditioning process, which, when completed, will comprise an entirely new tube mill plant of increased capacity, together with accessory classifying and slimes plant. The existing mill consists of 300 stamps on the back to back plan, and five tube mills. As was mentioned in a special article upon the mine a few weeks ago, the Robinson Deep is in the position of having a larger milling equipment than it is capable of supplying. In February only 210 stamps were at work, and during the twelve months of the last financial year the proposition was operated at nearly 23 per cent. below its metallurgical capacity, through shortage of native labour. According to the new scheme, 160 stamps only will be kept running, with ten tube-mills, the treatment capacity being about 2,000 tons per day, instead of, as at present, about 1,700 with 210 stamps. The object aimed at is evidently an increase of the proportion of slime produced, for, instead of their being one tube-mill to 40 stamps, which is, roughly, the ratio to-day, there will be one tube-mill to 16 stamps

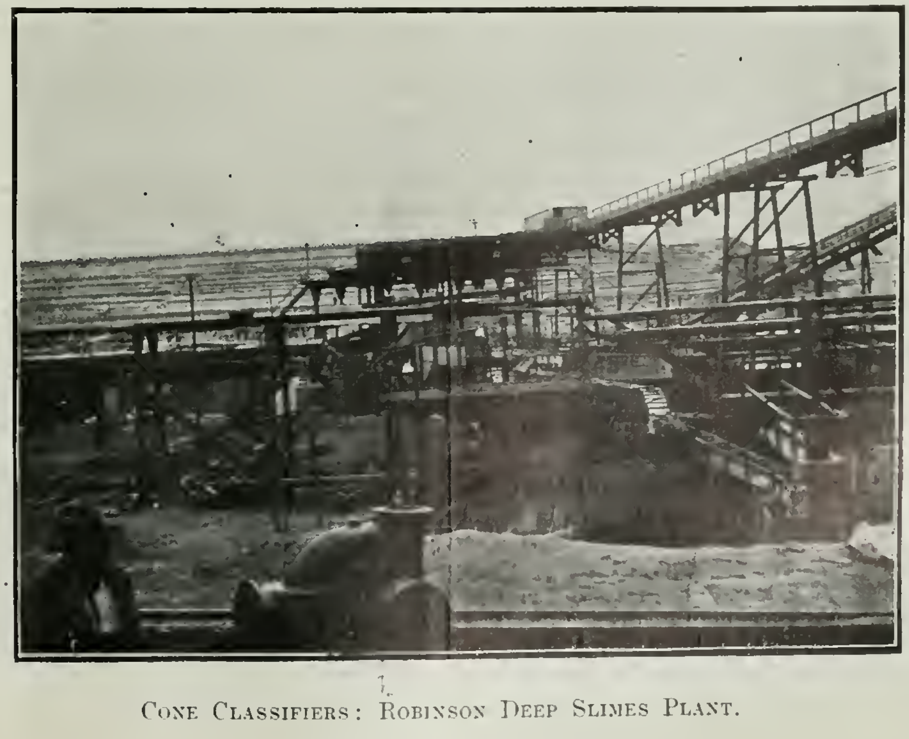


View of New Tube Mill Plant, Robinson Deep.

At first only half the proposed tube mill plant will be put into commission, that is to say, five tubes. These, together with those now in use, will be equal to the increased capacity contemplated, and thereafter the old tube mill plant will be supplanted piece by piece until the whole work is completed. The work now in progress is the southern half of the new installation. Four of the tubes are in place, the dewatering cones are erected, together with the bins to contain the pebble rock supply, and generally the greater portion of the construction has been effected. The old pebble rock bin at the southern end of the mill will now deliver to a conveyor belt, which in turn discharges the rock to another leading directly to the smaller bins. These have a



View of Old Tube Mill Plant, Robinson Deep.



Cone Classifiers: Robinson Deep Slimes Plant.

capacity of about seven tons each, and being situated immediately adjacent to the feed end of the tube-mills, deliver rock automatically to them by means of Schmitt's patent feeder. The dewatering cones, with Caldecott diaphragm, receive the pulp from launders which come directly from the mortar-box discharge in the case of the front row of stamps, and are fed by a Behr pump with the pulp coming from the back row, the latter arrangement being necessitated by the small amount of fall available over the distance. Both streams of pulp are passed together through a mixer before going to the dewatering cones. The tube-mills are driven by overhead belting from separate motors on the battery floor. The discharge from the tube mills passes over three stationary amalgamating plates, and thence to the pump pit. The overflow from the dewatering cones goes to four safety cones, the underproduct from which joins the plate discharge in the pit, and is pumped by Behr pumps back to the head of the tube mill circuit. On its way back from the return pumps to the dewatering cones the pulp passes through a magnetic separator, and thus the iron particles which have entered the stream from various sources are removed as completely as possible. The final pulp from the safety cone overflow is led along launders to the slimes plant, where, having been discharged into a catch-box, it is elevated by a couple of 10-inch Behr pumps to a set of eight 11ft. by 8ft. primary Caldecott cone classifiers, which discharge over the rims to a second set of five cone classifiers. The under product from all these classifiers goes to the sands plant, and the overflow from the last set to the slimes collectors. In order to meet the requirements of the enlarged scheme of slimes treatment, four new slime tanks, with dimensions 70ft. by 17ft. 6in., are in process of erection, and seven of the old slime treatment tanks are being converted into slime collectors. The Extractor house will have an addition of two new extractor boxes and two 24ft. by 4ft. filter tanks. A considerable amount of work has recently been carried out in the battery also, some 80 stamps having been provided with concrete foundations in place of the wooden piles which formerly supported them. The remaining stamps, which were erected at a later period, are built on anvil block and concrete foundations. In the more recent construction the anvil blocks have not been introduced, the mortar boxes standing directly upon the concrete with the usual insertion intervening. It is anticipated that the first section of five new tube mills will be put into commission about the first of May next, and the whole new plant in, say, another six months' time.

The illustrations accompanying these notes include one which shows the section of the tube-mill installation now in progress. The pebble feed bins are seen just under the battery floor, usually occupied by the amalgamating plates. This area is occupied by the motors which drive the tube-mills, as already explained. A difference will be noted between the cramped conditions of the old tube-mill plant and the comparative convenience of the new one. In the larger picture the classifiers for the slimes plant are shown, and in the foreground is shown the preparation of a bed for one of the new slime tanks.

THE BENONI POSITION.

The Board Contemplate New Cyanide Plant-- Sand Treatment Reported Unsatisfactory—A Metallurgical Expert Preparing Report.

The output declaration of the Benoni Consolidated since the beginning of operations has been as follows:—

1912.	Tons Milled.		Revenue per Ton Milled.			Expenditure per Ton Milled.			Profit per Ton Milled.	
			s.	d.		s.	d.		s.	d.
January	17,000	......	18	4	......	21	2	......	3	1
February	19,009	......	19	7	......	19	7	......	—	

In order to prevent any misconception arising from the foregoing way of presenting the statement, it may be explained that, to use an algebraical expression, the January profit was a minus quantity, or, to use a hibernicism, the profit was a loss. In February expenses were just about met, and there was an actual profit of £8, a figure which has little significance when transformed into decimals of a penny per ton milled. The figures for March are not available, but, as far as we can gather, they will not be particularly striking from any point of view.

Improved Screen Assays.

As far as the ore treated is concerned, it is said that the screen values for the past month have been uniformly over 7 dwts. per ton milled, and this is rather an important fact if it may be taken to indicate anything like the true value of the reserves. The estimate before crushing commenced was about 6½ dwts. average milling value.

Some little time ago it was decided, in view of the difficulties which attended the running of the slimes plant, to store the latter product for future use and proceed with the cyaniding of sand only. It was hoped by this means not only to avoid the trouble of intermittent and unsatisfactory slimes treatment, but to provide a larger plant capacity for the handling of sands, and so facilitate a bigger crushing. It is now reported that the sands treatment has not given the results which might reasonably be looked for, and that, in a word, the whole cyanide plant is, from the point of view of the board, a failure. What the difficulties are, precisely, in connection with the treatment of the sands in the agitator tanks has not been explained to us, but it will be remembered that at the outset the residues were officially stated to be something unusually good. They have obviously not continued so, and some figures quoted to us are far from creditable. What makes the matter still more puzzling is the fact that the agitation of sands is not an overwhelmingly difficult problem, to judge from the practical tests made here in the Paterson agitator and latterly in the Hendryx tank. At any rate the difficulty, if any, should not lie in the matter of getting an extraction.

Mr. F. L. Bosqui to Report.

The board having formed unfavourable opinions in regard to the entire cyanide installation, has, we understand, requested Mr. F. L. Bosqui to report upon the problem, and his report is now in preparation. It is perhaps unnecessary to say that it will include a Butters plant, and as a matter of fact the plans for a scheme of this kind in connection with Benoni are in progress. The proposal will doubtless be to use as much as possible of the existing agitator plant for slimes treatment, and instal an ordinary percolation system for the sands.

In the meantime there is the all-important problem of finance to be dealt with. The company may be said to owe, in round numbers, over £200,000, and we should probably not be far wrong in suggesting that another £75,000 will be necessary to carry out the contemplated programme of alteration and betterment. It is obvious to anyone that, in such circumstances as those of the Benoni Consolidated a reconstruction is the inevitable process, and when Mr. Bosqui's report has been duly received and considered an announcement to that effect may presumably be looked for. Since the above was written, the annual reports of the company have been received. They are dealt with elsewhere in this issue.

DEVELOPMENT ON THE RAND IN 1911.

The Mines and their Ore Reserves—The Stock-in-Trade of the Industry—Position at Two More Important Mines Considered.

II.—VILLAGE DEEP AND GELDENHUIS DEEP.

Development operations at the Village Deep resulted in a total footage of 29,132 feet during 1911. Of this drives accounted for 16,216 feet and winzes and raises 9,359 feet. Less than 50 per cent. of this footage was in reef formation—to be precise 14,119 feet, or 48 per cent. were in conglomerate, and the reef disclosures were as follows:—

	Width. Inches.	Assay Value. Dwts.
Main Reef Leader	27	13.1
South Reef	21	13.0

In the preceding year the width of the Main Reef Leader exposed was 32 ins.; and the average assay value 9.6 dwts. per ton. Thus whilst the width exploited last year was less than in 1910, the value was much higher, and on an inch dwt. basis the 1911 showing in the Main Reef Leader was better than in 1910. In South Reef development the results for last year were much the same on an inch dwt. basis as in 1910. The width exposed in 1910 was 5 inches greater than during last year, but the 1911 value was 13 dwts. per ton as compared with 10.6 dwts. in the previous 12 months.

A Strong Position.

The net result of development in the Village Deep last year was that 704,155 tons were exposed by drives and stoping in undeveloped ground, and in addition to the above 792,000 tons of Main Reef Leader have been blocked out on the drives put in below the reef, which cannot at present be completely valued, but of which at least 80 per cent. may be estimated payable. At the end of last year the payable ore reserves amounted to 2,159,792 tons of an average assay value of 6.1 dwts. This compares with 1,943,593 tons of 6.1 dwts. value at the end of 1910. The development position in this property appears to be wholly satisfactory. The better values and widths secured on the South Reef is a most encouraging feature, and it should be observed that the payable ore reserves, excluding large tonnages which cannot at present be completely valued, are three years or more ahead of mill requirements.

The Geldenhuis Deep's Showing.

On the other hand, the Geldenhuis Deep was not at the end of last year in such a satisfactory position as at the end of 1910. The Geldenhuis Deep development totalled 30,273 feet, of which 15,830 feet, or about 52 per cent. was in reef formation. In each reef the disclosures for 1911 were less satisfactory than those of 1910, as the following table shows:—

	1910.			1911.		
	Exposed. Feet.	Width. Ins.	Value. Dwts.	Exposed. Feet.	Width. Ins.	Value Dwts
Main Reef...	10,291	23.2	9.2	7,772	21	7.3
Main Reef Leader .	6,554	10	24.5	11,937	9	21.1
South Reef..	5,376	15	15.2	9,376	13	14.0

It will be observed that there is an all round decline in both reef widths and values at this mine.

Increased Footage Imperative.

At this mine the average footage for the first five months of last year was under 1,700 feet per month, whilst for the remainder an average of 3,112 feet was driven, sunk, and risen. This policy of increased development was decided on because of the low payability of the reef disclosures. It was agreed that such work was imperative and would have to be rigidly adhered to. The total ore exposed by the development operations for the year was 1,448,614 tons. As against this 1,013,323 tons were mined and 801,860 tons milled. But of the ore developed 652,663 tons, or not more than 45 per cent., were payable, of 6.7 dwts. value. Compared with the position at the end of the previous year there is a decrease in the aggregate tonnage in reserve amounting to 258,641 tons, while the grade shows a slight—a very slight—increase. These reserves may be segregated as under:—

	Value.	Value, Dwts. per Ton.
Main Reef	842,392	5.6
Main Reef Leader...	762,769	6.7
South Reef	657,679	6.4
	2,262,840	6.2

Contrasting these figures with those given at the end of the preceding year, a small increase is to be observed in the South Reef tonnage, and a decline of about 160,000 tons in the Main Reef aggregate and 100,000 tons in respect of the Main Reef Leader. The North Section, which includes the Geldenhuis Estate, is approaching exhaustion, and only a little over 100,000 tons from this area of the property are included in the estimate. This North Section will continue to supply ore for some time to come, but in diminishing quantities, and it may be remarked that the North Mill has been closed down since the 23rd of January last. Mr. B. Madew, the company's consulting engineer, in his report states that "the values disclosed in the bottom levels of the East and West Sections are not quite up to expectations; there is, however, reason to believe that the values may improve towards the southern boundary, especially in the Eastern Section. Mr. Madew does not advance anything of a tangible or material nature in support of these expectations, but it is to be presumed that reef exposures in the Jupiter mine which adjoins the Geldenhuis Deep on the South, give some indications which have a direct bearing on the future southern development of the Geldenhuis Deep. Of the two and a quarter odd million tons of pay ore in the Geldenhuis Deep, 1,191,551 tons, of 6.1 dwts. value, are classified as fully blocked out for stoping, three-quarters of a million tons of 6·3 dwts. value are "ore valued which will be rendered available for stoping by current development and sand-filling," and the remaining three-quarters of a million tons are classified as "ore contained in shaft and boundary pillars, and therefore unavailable for stoping at present." It is to be observed that in the additions to the payable reserves there is an accumulation of no less than 3,693,175 tons of unpayable ore, averaging 2.7 dwts. per ton. A considerable quantity of this is, however, on the margin of payability, and can be profitably mined under improved working conditions."

Geldenhuis Deep.

The following was cabled to London on the 29th ultimo. "Results this month will be affected by change over to double stage hoisting No. 2 Shaft. Profit will be a little lower than last month. Expect smooth run next month."

East Rand Proprietary Mines.

The results of last month's operations at the East Rand Proprietary Mines are as follows:—820 stamps milled 163,000 tons; 66,147 ounces of fine gold recovered from all sources; £101,361 profit for the month.

Three months' profits: January, £67,108; February, £75,609; March, £101,361.

MACHINE DRILLS ON THE RAND.

A Series of Successful Trials Recorded—Machine Stoping Under Varied Conditions—Narrow Reefs No Considerable Obstacle.

In the struggle against the many disadvantages of an inefficient and inadequate native labour supply the assistance of the machine stoping drill has proved of such unquestionable use that the tone of diffidence which characterised even the most sanguine expressions of opinion in this connection only a year or so ago has now changed to one of unmistakable confidence. A noteworthy testimony to the usefulness of small machines, even under adverse conditions, was made recently by Mr. M. G. Elkan, who presided at the last annual meeting of the Princess Estate and Gold Mining Company, Ltd. "The mines in the Roodepoort district," he remarked, "have always been held to be totally unsuited for rock drills, but during the period of their great distress they resolved to give rock drills another trial. The results obtained so far on the mine are encouraging—indeed, I think we can claim to have already proved that rock drills can be employed to advantage on the narrow Roodepoort reefs." As we pointed out in an article on this mine a few weeks ago, the drills employed latterly were Ingersoll and Waugh hammer drills, and according to the development figures then quoted it will be seen that the milling width of the South Reef, the mainstay of the property, is estimated at about 25 inches. In other words it has been found that in the narrowest as well as in the widest ore-bodies of the Rand the machine drill with fairly capable handling can give satisfactory results.

An All-Machine Mine.

Another reference that is worthy of quotation is that of Mr. W. L. Honnold, consulting engineer to the Brakpan Mines, Ltd. In his last annual report upon this undertaking, he states: "A point of notable significance is that, owing mainly to the comparatively large reef width and favourable dip conditions, it has been found practicable to utilise machine drills to a much greater extent than expected, thus relieving an otherwise serious labour shortage. This does not mean that the whole of the mine can be best worked with machines, but rather that as the mine stands to-day there is so considerable a portion of it open to this method, either obviously, or at small disadvantage, as to render of relatively small importance the areas which in consequence have to be excluded from the payable, for the time being at least. At present practically all the ore mined is broken by machine drills, and there is as yet no evidence of a change that would alter this position. There has been a steady improvement in machine efficiency, and it is clear that, even on the present labour basis, this tendency would continue and permit of a gradually increased output. It is equally clear, however, that more labour should be allotted to development in the near future."

Thirty per cent. Labour Supplanted.

The Lancaster West, as has been already remarked upon in this journal, has had a valuable experience in the employment of machine stoping, and it is interesting to hear Mr. Neuhaus' summing-up of the results of the trial which was forced upon the company by the shortage of native labour. Having mentioned the heavy outlay which was necessary before the work could be entered upon, he added: "At first the work done with the aid of machine drills owing to the inexperience of the men handling them, was naturally not quite satisfactory, but by the end of the year the manager was able to report that the results compared favourably with hand stoping as regards costs, while the width of the stopes, and therefore the value obtained per ton, did not suffer. By the adoption of this measure it was found possible to work the mine with some eight hundred natives less than heretofore. As this means a saving of no less than 30 per cent. of the total unskilled labour formerly necessary, it may be justly said that a revolution has taken place in the method of working the mine. Indeed, as much appears from the manager's statement that, while at the beginning of the period under review, only 8 per cent. of the tonnage mined was obtained from stopes worked with the aid of machines, as much as 65 per cent. was being broken by this method at the end of the year."

Intelligent Supervision Wanted.

These statements go to show that the machine stoping drill, under the compulsion of that necessity which is the mother of invention, has shown itself capable of dealing economically with most of the mining problems presented by the unwillingness or inability of the unskilled Kaffir to do the work required of him. It has established itself as a recognised utility on the Rand, and what is now necessary is that its sphere of usefulness should be extended and facilitated. An important factor in this connection is the training of supervisors, no less than workers; the machines in use to-day are sufficiently simple in their operation, handy and fool-proof, to meet the demands of the average Kaffir: but in order that they may be run efficiently a certain amount of intelligent direction and control must be provided. This will come by degrees and in proportion as this demand is supplied so will the difficulty of the native labour scarcity be remedied. There are circumstances, nevertheless, in which the use of machine drills for stoping purposes is likely to be always more or less impossible. For instance, as in some portions of the Durban Roodepoort Deep. Here, also, the advantages of machinery have been largely investigated. "It is estimated," says Mr. Percy Cazalet, the Consulting Engineer, "that if the present rate of development can be maintained, by the middle of the current year enough fresh stoping faces will have been rendered available, especially on the Main Reef, to make the mine more independent of fluctuations in the labour supply, since Main Reef can be broken by machines, while the South Reef, with its treacherous hanging wall, is quite unsuited to any type of machine drill yet experimented with."

From the few quotations above made from various reports, it will be seen that no means have been neglected by the mining groups to take advantage of the opening afforded by machine drills for the solving of the labour problem, although the prospects of the undertaking were not at the outset considered overwhelmingly attractive. That success has followed upon their efforts is greatly to the credit both of those who confidently advised the expenditure necessary and of those who generously responded to the request. We cannot conclude these notes without a reference again to the splendid pioneer work done in this connection by Mr. Leslie and the technical staff of the Consolidated Gold Fields. It is unnecessary to say much upon this occasion, because we have more than once drawn attention to the results achieved by the group, particularly at the Robinson Deep.

Government Mining Areas.

We are informed that the south-east shaft of the Government Gold Mining Areas (Modderfontein) Consolidated property was sunk 233 feet last month, which, we believe, is a record, and far in excess of any shaft sinking work previously done on these fields.

Diamond Actions in German South-West.

In the test case of Carlstal Diamond Company v. Koloniale Gesellschaft, the Appeal Court at Windhuk has upheld the latter company's claims of a field tax of 30 marks annually per hectare since 1905 on all fields under the jurisdiction of the Koloniale, Bergbau Gesellschaft, Kolmanskop and Weiss de Meillon companies. It is expected that the case will be reopened by the various companies affected. In the appeal case judgment was given in favour of the Hahnfelder Diamant Gesellschaft.

"T.C.L." MINING AND PROSPECTING.

A Year's Progress Reviewed—Brighter Prospects for Mount Morgan—Fairview Floated—Rietfontein Equipment: Interesting Features—Zinc and Copper Interests.

Engineer's Report.

In his annual report on the Transvaal Consolidated Land mining properties, Mr. J. J. Garrard, the engineer to the company, writes, *inter alia* :—Prospecting arrangements granted by the company over the following farms belonging to it have lapsed during the year :—Zwartkarns (½), No. 1092, Buffelshoek, No. 1735, Koedoesfontein, No. 309, Waterberg District, and Der Brochen (½), No. 1158, Lydenburg District. No such agreements were in force at the close of the year. Witfontein, No. 371, and Newbury, No. 937, Waterberg.—918 feet of driving and sinking, in addition to 2,131 feet of surface trenching, have been carried out on the occurrence in the shales and felsites of the Lower Waterberg series mentioned in the last annual report. The fissure in the shales threw out an offshoot along the bedding planes of the shales, which was followed in depth until the tin values gave out, when it was found that the fissure itself continued down nearly vertically into the felsites. High tin values have recently been found in places on this fissure, which has the appearance of a permanent lode, although to forecast future possibilities in this vicinity, where so many disappointments have been met with, is not advisable. All that can be said is that this occurrence so far promises well. Welgevonden, No. 777, and Welgelegen, No. 357, Waterberg.—The work previously reported as having been done on the adjoining farm Waterval by a syndicate has been continued, the total vertical depth being 260 feet from the surface, and the total lateral development 170 feet. A re-survey has shown that all these workings are actually just within the Welgevonden boundary line, and not on Waterval at all. The deposit is very irregular in character, patchy in values, and at present of so low a grade that it is not proposed to work it. Weynek, No. 763, Rustenburg.—A development footage of 649 feet has been driven and sunk during the year, making the total footage 2,918 feet. The development for the year, however, has not disclosed further pay ore, so that the payable footage remains the same as that given in last annual report, viz., 1,051 feet, showing an average value of 1.7 per cent. metallic tin over 35 inches. The tonnage of ore developed remains at approximately 13,000 tons of an average value of 1.79 per cent. metallic tin over an average width of 34 inches. The main shaft has been sunk to a depth of 556 feet on the dip of the lode, with no payable values below 165 feet. Small amounts of visible cassiterite have occasionally been met with during the year in this shaft, and some is still showing at the bottom. No. 2 shaft (514 feet north of the main shaft) has been sunk to a depth of 366 feet (equivalent to 156 feet if compared with the main shaft, owing to the difference in surface level) with no payable values below 160 feet, and this also only carries traces of tin. It was decided in October last to discontinue for the time being all underground work here until such time as it is considered advisable to extract and mill the tonnage already developed, when I should recommend that sinking in depth be continued in anticipation of a recurrence of values in depth which, from the well-defined nature of the lode, and the fact that it still carries a little tin at the bottom, it seems reasonable to expect. Vaalwater, No. 764, Rustenburg.—The option over claims on this farm, which adjoins Weynek, and contains the extension of the Weynek reef, has been thrown up, as nothing of a payable nature was disclosed by the prospecting work carried out. Fairview Claims, Barberton District.—Of the 335 claims originally held, 73 have been abandoned, 262 claims in one block being retained. The property is situated at Fairview, about seven miles from Barberton, and about three miles from the Sheba Mine. A portion only of these claims has so far been prospected. Several highly inclined impregnated fractures traversing the tilted shales accompanying what is locally termed the "Sheba Bar" have been opened up by surface cuttings and underground development, the deepest point being 230 feet on the dip of the reef, where a second level has exposed payable ore. The gold occurs in an extraordinarily fine state of division along certain zones of replacement following an intricate system of fractures, which are very difficult to distinguish from the country rock at the surface. 3,812 feet of driving, sinking and cross-cutting have been carried out during the year. The total amount of driving, sinking, and cross-cutting, exclusive of many thousands of feet of surface trenching, is 4,938 feet, of which 3,858 feet are on the reef itself. Of this the payable portion is 2,610 feet (equivalent to 67.6 per cent.), showing an average value of 18 dwts. over 31 inches, and, for the purposes of calculation, only sections carrying above 5 dwts. over a stoping width have been taken into account as payable. The tonnage of ore developed is 25,318 tons of an average value of 12.9 dwts. over a stoping width of 36 inches. In addition, there is a good deal of payable ore exposed in the workings not yet sufficiently developed to estimate its quantity or value, besides some 6,000 tons of development rock at grass, estimated at about 6 dwts. The option over these claims has been exercised by the flotation of a company called "Fairview (T.C.L.), Limited," having a working captial of £15,000, which is sufficient to provide for a small reduction plant which it is proposed to erect almost immediately, and to carry on work until this plant is running. The company's interest in the Fairview (T.C.L.), Limited, is 58½ per cent. of the capital of £45,000. The company owns 54 claims in its own right adjoining the Fairview block, and if Fairview turns out well they should become valuable. Florence and George's Claims, Barberton District. Options were taken over these two adjoining blocks, aggregating 57 claims, on which prospecting and development work has been carried out from adit levels. Extraction tests show that a fair extraction is obtainable from the oxidised ore, but that the pyritic ore is refractory, and further experiments therewith are now in progress with a view to ascertaining whether this pyritic ore is payable or not. Mount Morgan Mine, Barberton.—The company's metallurgist, Mr. E. V. Pearce, having completed his experiments on the treatment of this ore, was confident of being able to obtain a satisfactory extraction, and development was accordingly restarted in August with a view to increasing the ore reserves sufficiently to justify the erection of the reduction plant recommended by Mr. Pearce. The increased cost of testing this refractory ore by Mr. Pearce's method has, however, necessitated the raising of the pay limit of the ore, involving a corresponding reduction in the tonnage developed as mentioned in the last annual report. As mentioned in the last quarterly report also, a re-survey of the mine indicates considerable alterations in the relative positions of blocks previously estimated as payable. This has also reduced their payable contents. The development work since operations re-started has, however, added a considerable tonnage of payable ore, so that the total payable tonnage developed at the end of February amounted to 17,480 tons of an average value of 8.9 dwts. over an average width of 61 inches. Development is being actively proceeded with, and shows an increase width of payable reef in depth. It is expected that the payable tonnage developed will be largely augmented in the next few months, which will warrant the further expenditure on the plant necessary to enable the mine to be brought to a producing stage. The last 100 feet of driving in the lowest level, which has hitherto been unpayable, have averaged 6.5 dwts. over 120 inches, indicating the presence in depth of the main ore shoot; whilst after 100 feet of driving through barren ground in the main adit the last 15 feet of reef have shown 5.8 dwts. over 35 inches, indicating the probable existence of a new pay shoot in this direction. These developments—quite new features in the mine—open out a much brighter prospect for it than has previously existed. Zaaiplaats Lease. 656 feet of development work has been done during the year. The payable ore developed and at grass, amounting to 2,163 tons, was crushed at the Groenfontein mill with the Government's consent, resulting in an estimated profit of £2,430, which reduces the total expenditure on this property to £5,987 4s. 1d. as at 31st December, 1911. Prospecting is now being carried on on lines of fissuring by means of diamond drill boreholes to endeavour to locate further payable ore bodies. The principal tin-bearing pipe worked by the Zaaiplaats Tin Mining Company, Limited, is now within 500 feet of the boundary of this lease, and making towards it. Mining leases granted on company's farms: Weynek Tin Company, Limited This company has gone into liquidation, and the lease has been concelled. Reitfontein, No. 3, Waterberg—A large amount of prospecting and devlopment work has been carried out on this mining lease, on which about £2,800 have been expended by the lessees, who are at present endeavouring to raise further working capital to enable work to be continued. Mining interests held by company :—Rietfontein (T.C.L.), Limited, Lydenburg.—4,610 feet of driving, sinking, rising, and cross-cutting have been carried out during the year. Of this, 2,743 feet are on the reef itself, of which 1,151 (equal to 41.9 per cent.) show payable values, viz., 15 dwts., over 27 inches. The total amount of driving, sinking, cross-cutting and open cutting to 31st December, 1911, is 8,786 feet. Of this 4,733 feet are on the reef, of which 2,266 feet (equal to 47.8 per cent.) show payable values, viz., 15.3 dwts. over 25.2 inches. The development on this reef has shown that the ore in depth becomes in places refractory to ordinary cyanide treatment, chiefly owing to the presence of copper and arsenic, and work in the lower level has therefore been stopped for the time being. Experiments are, however, still being made to find a suitable method of recovery. In the meantime, it has been decided to erect a small reduction plant capable of treating about 60 tons per day, consisting of two Nissen stamps (equal to 10 light stamps), one tube mill, and cyanide plant for sands and slimes, including a Brown agitating tank. This plant will deal with ore from the upper portions of the mine, which from extraction tests already carried out is shown to be amenable to ordinary cyanide treatment. There is sufficient tonnage already exposed by stope development to pay for the cost of the plant as well as a large proportion of the mining expenditure to date. The whole of the reduction plant will be driven direct by a Pelton wheel at the end of a pipe line from the hydraulic air compressor referred to in last year's report. This compressor was successfully started during the year, and is capable of providing air for at least five machine drills. Water is flumed from the top of a waterfall to a special head-box, where as much air as possible is entrained with it, and the mixture of air and water is sent down an inclined pipe to a long cylindrical receiver, where the air separates from the water again and fills the upper portion of the cylinder with isothermally compressed air under a pressure of about 90 lbs., per square inch: an air pipe from this receiver supplies the mine with compressed air, and the water issuing from the receiver—now depleted of air—passes on through 800 feet of piping to the Pelton wheel driving the mill. Thus a considerable volume of air, compressed at the temperature of the water, is produced without the aid of any moving or wearing parts on its way to its ordinary use in providing power, the only additional cost being for the special head-box at the top and the receiver at the bottom which would in any case be required with any other form of air compressor. This combination is, so far as I know, the only installation of its kind in the world, and for the results obtained in compressed air and water power probably the cheapest in both first cost and working expenditure. A small plantation of 20 acres of wattle and gum trees is being established. The timber will be utilised for mining purposes. Butterfly-Cecil Group, Rhodesia.—The company has acquired a 10 per cent. interest on very reasonable terms in 30 blocks of claims in the Hartley District, Rhodesia, on which development is proceeding. Swaziland Tin, Limited, Swaziland.—On visiting the property of this company early in the year with your chairman, I was much impressed with its possibilities, provided it was worked by modern hydraulicing methods. In view of the profit then being earned by the existing methods and the increase I foresaw if they were improved upon, I recommended the Board to purchase the company's shares. I made certain recommendations for the improvement and increase of the water supply, which were given effect to, but the time occupied in making these changes has been considerably longer than could have been foreseen at this time last year. As a consequence, the profits have not yet shown the expected increase. I am glad to learn, however, that the necessary construction is now virtually completed, and that Mr. H. D. Day, an engineer thoroughly conversant with hydraulic for tin, who has spent the past two months on the property, anticipates that there will be no difficulty in recovering about 35 tons of tin monthly in about a month from now. The methods now coming into operation will permit of economics being effected in respect of labour, and from an examination of the company's returns such an output should yield a profit, taking tin at £180 per ton, of more than £2,000 monthly, sufficient, that is, to pay a dividend of about 30 per cent. on the capital of the company. I recommended extensive boring operations to test the extent of the deposits. These have been carried out, and Mr. Day reports that in his opinion the above-mentioned output should probably be maintained for at least 12 years. Leeuwpoort, No. 938, Rustenburg.—I acted as consulting engineer to this venture till the end of August, when I left for Europe. The tonnage developed up to the beginning of July was 18,561 tons, averaging 2.8 per cent. metallic tin over a stoping width of 36 inches. Since that date the supervision has resumed by the African Farms, Limited, who control the proposition. From the annual report of the African Farms, Limited, just issued, it is seen that later developments have been most satisfactory. The manager of the mine reports that the tonnage developed up to 29th February last is estimated at 80,097 milling tons, which he values at £235,611 after allowing for 10 per cent., to 20 per cent. sorting 80 per cent. extraction, and taking the price of tin, I understand, at £180 per ton. I am further informed that careful testing has proved the existence of a very valuable alluvial deposit. It is proposed to float a company almost immediately to take over and work the property, and estimates for the necessary plant are, I understand, in course of preparation. Marico Zinc Mines—The company acquired during the year a 40 per cenet. interest in certain options in respect of zinc workings in the Marico district, consisting of the Witkop Mine and Buffelshoek Mine. Over 2,000 feet of development work has been done since May last, and a large tonnage of ore has been partially developed. The deposit of zinc ore in these two mines occurs in the form of disconnected circular areas associated with the limestone and cherts of the dolomite series. Representative samples of ore have been sent to America with a view to deciding upon the most suitable method of treatment. The prospects of this venture are encouraging, and point to the possibility of establishing a profitable zinc mining industry. General.—An examination of several of the company's farms, and several farms belonging to other parties, in the Rustenberg District, was made during the year without disclosing any minerals of a payable nature. An examination was made early in the year of a number of old workings supposed to contain tin in the Lomagundi district of Rhodesia, and a small amount of prospecting for tin was carried out on ground held under an option in the Enterprise District of Rhodesia, but the results were not sufficiently encouraging to warrant further expenditure. A tin property near Capetowns and various gold propositions in the Barberton District and in Rhodesia, were also examined during the year, but proved to be insufficiently attractive. An exhaustive examination of the Motale Copper Fields in the North-Eastern Transvaal was also undertaken during the year, under an option in which the company acquired an interest. The property was not, however, considered sufficiently developed or favourably enough situated to justify acceptance of the owners' terms, and the option was accordingly dropped.

G.S.W.A. DIAMOND INVESTMENT CO., LTD.

Second Year's Work—Effect of German Taxation—Companies Cease Operations.

The second annual meeting of the German South-West African Diamond Investment Co., Ltd., was held in Cape Town this week, Mr. E. Ginsberg, M.P.C., presiding. The Chairman, in moving the adoption of the report and accounts, said, *inter alia*: In submitting the directors' report and statement of accounts for the past year, I regret that I am not able to-day to present you with a more satisfactory statement than that before you. You will observe from the directors' report that during the year, the companies in German South-West Africa in which your company is interested, have stopped work pending the introduction of a different method of taxation to that obtaining at present. You are no doubt aware that owing to the heavy burden placed upon the producers of diamonds in German South-West Africa by a system of export duty levied on the gross proceeds of the diamonds produced, and other imposts levied in a similar manner, all companies, with the exception of two or three concerns, have stopped work. Reference is made in the directors' report to information which has appeared in the Press that the German Government has decided to effect an alteration in the basis of taxation, and I have much pleasure in informing you that during the last few days information has been received, which I think may be considered official, that the German Government has finally decided to transform the existing export duty into a tax on the net profits. I am also informed that very low grade material, the profit on which does not exceed 3s. per carat, will be exempt from taxation, and that a sliding scale would be applied as to the proportion of taxation payable, which would place the mines with low grade material in a more favourable position. I beg to draw your attention to the interest your company has acquired in connection with a copper proposition in German South-West Africa. The proposition in question consists of nine fields, of an approximate area of 1,500 acres. The engineer of the Namaqua Copper Company is now on the property inspecting same, and your directors are awaiting the result of this investigation. It is, of course, questionable whether your company will derive some benefit out of the acquisition; in any case the expenditure incurred is only a very trifling one. The accounts show, I regret to say, a loss of £928 18s. 9d. Your revenue consisted of dividends on investments, £160. Since the closing of the books further dividends have been received on the remaining gold shares to the extent of £63 13s. 9d., which amount will, of course, appear in next year's accounts. The question of the liquidation of the three companies, viz., the Zillertal, Carlstal and Phœnix, in which your company holds its chief interests, has arisen during the last few months, and having received assurances that the interests of the investment company are safeguarded, your directors agreed to this course being taken. We are informed that this has been done in compliance with the laws of German South-West Africa. The assets of the three concerns will be taken over by a new company to be registered, in which company the investment company will hold a share proportionate to its present holding in the three liquidated concerns. During the year the question of the field tax, referred to in my remarks at last year's meeting, has been settled by the lower courts of German South-West Africa in favour of the diamond companies. The final settlement of this question is still pending, an appeal having been made by the Koloniale Gesellschaft, and this appeal, we are informed, should have been decided on the 27th of this month. In conclusion, I regret to say that I am unable to present you with a more favourable report, and can only express the hope that the present year will be a more prosperous one for the company. Since writing the above report, we have received official information that the field tax case, Karlstal Company *v.* the Koloniale Gesellschaft, has been decided in favour of the latter. We are awaiting particulars of further developments, but in the meantime I may say that the imposition of such a tax would have a very serious influence on the future of the company in question.

RECENT PROGRESS OF NEW PRODUCERS.

Randfontein Central Figures—Brakpan Results—Modder "B" First Returns.

It has scarcely needed the recent wholesale changes in the administrative and technical staff at Randfontein to draw attention to the fact that an improvement in some direction was desirable. Whether the changes that have lately been made are going to effect this improvement remains to be seen, and in the meantime the public are awaiting the March crushing results with more than ordinary interest. During the last twelve months there has been a fall in profits from 8s. 11d. per ton milled in the March quarter of 1911, to 6s. 2d., as at the end of February, a diminution of nearly 3s. per ton. The principal factor in this falling off has been the increase of working costs. The effect is seen very distinctly in the globular sums representing profits, for while in October last, to go no further back, the latter amounted to £80,000, in February they did not exceed £65,000. It will be noted, also that this gradual but continuous diminution of profits has coincided with an increase in the tonnage milled, and a closer attention to sorting.

The South in February.

In February, however, there was a material decrease in the revenue per ton, and it is understood that this was to some extent the result of the fact that the yield per ton at the southern section of the property was not equal to that of the previous month. Shareholders will be concerned to know whether this is merely an evanescent phase of the output or whether the recent developments in the South are not up to the former average; for it is probably a matter of common knowledge that the ore of the southern section is the mainstay of the whole property, and that a large proportion of the profits, to an amount of perhaps £50,000 per month, has in the past been contributed by this section to the total sum earned. Not only this, but the ratio of pay rock per foot of development is very considerably greater in the Southern than in the Northern portion of the Randfontein Central, as we have pointed out in this journal already. In view of the fact that profits are being looked to, not only for purposes of a dividend, but also in order to provide for the large capital expenditure balance which was not met by the debenture issue, it is genuinely to be hoped that Sir Joseph Robinson will be able to bring about an improvement in the aspect of affairs during his present visit.

Brakpan Consolidated.

The Brakpan Consolidated is one of the few companies that have got steadily into their stride without any obvious spasmodic efforts, and, better still, without any sign of premature decay. The following figures are distinctly creditable to the technical control:—

	Tons.	Revenue.		Expenses.		Profit.	
Sept.	40,753	£55,811	27/ 5	£34,295	16/10	£20,776	10 2
Oct. .	42,089	55,751	26/ 6	34,965	16/ 7	20,106	9 7
Nov. .	39,688	56,737	28/ 7	35,950	18/ 1	20,152	10 2
Dec. ..	40,090	57,251	28/ 7	36,603	18/ 3	20,111	10 0
Jan. ..	41,060	59,124	28/ 6	37,115	18/ 1	21,373	10 5
Feb. ..	42,177	61,358	28/11	37,498	17/ 9	23,223	11 0

The variations in working costs are such as may well be expected at any mine under the unsatisfactory labour conditions of to-day, and particularly in a mine in the earliest stages of its career. The figures quoted above, together with the encouraging tone of the last annual report, are in every way gratifying, and particularly so when one considers the locality in which the property is situated.

Modder "B."

The performance at Modder B. is also a satisfactory one, although it is somewhat early to attempt any definite conclusions as to future operations in view of the fact that the company is admittedly milling ore, for the time being, which is above the average grade. The following summary of results is of interest. It is perhaps necessary to explain that the November declaration, which was the first, includes a portion of the return from the trial run in October:—

	Tons.	Revenue.		Expenses.		Profit.	
Nov. ..	47,360	£78,846	33/ 4	£51,443	21/ 8	£26,410	11 2
Dec. ..	30,600	52,481	34/ 4	29,621	19/ 4	22,199	14 6
Jan. ..	31,100	52,417	33/ 9	29,360	18/10	22,400	14 5
Feb. ..	29,500	50,692	34/ 4	28,313	19/ 2	21,500	14 7

It may be added that the company had a gold reserve of 4,911 ozs. in January, which was increased to 5,828 ozs. in February.

RESULTS FROM GROENFONTEIN TIN MINE.

Engineer's Review and Description of Plant.

The following are the details of the operations at this mine for the year 1911:—Number of lenses worked on, including branches, 55; footage on lenses, 2,412 feet; footage on main shafts and cross-cuts, 292 feet; footage on pegmatite vein, 340 feet; sundry footage, 386 feet. Total, 3,430 feet. The tonnage mined during the year was 10,185 tons. Milling and concentrating—Number of stamps in operation, 10; running time, 136.5 days; mine rock crushed, 4,251 tons; duty per stamp per twenty-four hours, 3.1 tons; accumulated sands re-treated, 5,793 tons; total tonnage treated, 10,044 tons; total concentrates produced from milling, 360.472 shore tons; average value of concentrates, 67.73 per cent.; average yield in concentrates 3.58 per cent.; average yield in metallic tin, 2.42 per cent.; alluvial concentrates produced, 3.752 short tons; average value of alluvial concentrates, 72.44 per cent.; total concentrates produced from all sources, 364.224 tons; average value, 67.79 per cent. M.T.; estimated profit, £7,476 9s. 6d.

In his annual report to the "T.C.L.," J. J. Garrard writes:—The capital expenditure for the year was £21,752 15s. 9d., of which £319 14s. 4d. was for the sub-manager's house, £480 16s. 3d. for the plantation, and £505 14s. 5d. for rag frames and frue vanners, the remainder being for the hill alluvial scheme. The output for the year has amounted to 364 short tons of 67.8 per cent., concentrates, as against 886 tons of 70.9 per cent. concentrates last year, the estimated net profit for the year being £7,476 9s. 6d. The heavy decrease in the output has been due to the fact that no recurrence of values was found in No. 9 pipe—previously the mine's chief producer—although 262 feet of further driving on two branches was carried out, and No. 30 working—which has been the next best producer—became unpayable in June. No new discoveries of importance were made during the year; this, however, was partially due to the delay in getting the alluvial washing scheme into operation, owing to the fact that the pipes supplied were of inferior quality and had to be replaced. Through the depletion of the ore reserves in the latter half of the year, it was not found possible to run the mill satisfactorily, and accordingly the crushing of Groenfontein ore was stopped in the middle of October, the opportunity being taken to crush ore from the Zaai plaats lease adjoining, and for the remainder of the year the mill was utilised in this manner. In the meanwhile, prospecting for new tin-bearing deposits was carried on energetically, and the completion of the hydraulicing plant hurried forward, it bein confidently anticipated that the washing off of the overburden would disclose new pipes in addition to incidentally recovering a certain amount of shed tin from such overburden. Out of 35 diamond-drill boreholes sunk during the year on the dip of the pegmatite outcrop, a little tin has been found in fifteen and good values in two of the holes. A vertical shaft has been sunk on one of these latter, disclosing a small pipe in connection with a well-defined fissure which has been found to be tin-bearing. The importance of this discovery, taken in conjunction with the recent discovery of other similar fissures at different points, is considerable, and I believe may prove to indicate the source of the tin in the pipes, as it is possible that these fissures have formed the channels through which the tin-bearing vapours ascended, and that, when they happened to intersect pre-existing pipes, owing to the favourable nature of the contents of these pipes as compared with the surrounding granite, the vapours found a more convenient passage, tin being deposited in them from the point of intersection right up to their upper limits, and possibly to a small extent only on the lower side of the point of intersection. A diligent search is now being carried out for the evidences of such fissures in the case of all pipes which have lost their values in depth. Another possible source of tin may lie in a number of pegmatite veins dipping at from 20 to 40 degrees in various directions, but always at a steeper dip than the main pegmatite vein, which lies approximately on the contact between the granite and the granophyre. Such veins have been met with in about eight different places, all of which workings have yielded tin, and it is proposed to pay particular attention to these occurrences in any future work. A portion of the sands residues was re-treated during the year, resulting in the recovery of 100 tons of concentrates, and the remainder, together with the slimes residues, are now being tested with a view to the erection of a slimes plant for the re-treatment of these and current slimes. The alluvial washing plant has just recommenced operations. Under this scheme, monitors will be used to wash the overburden off the underlying granite with a view to locating new tin-bearing deposits therein. This work, which otherwise would have to be done by hand labour, will now be much more cheaply, rapidly, and effectively carried out by the monitors, and it is quite possible that the shed tin recovered in the process by means of tail races and sluice boxes will more than pay the cost of these hydraulic operations. One small tin-bearing pipe has already been exposed by this means, and as soon as the plant is in proper running order it is hoped to find a number more. A central power station near the mill supplies the necessary electric power which is transmitted by power lines to the well pump, the pump-lifting to the top of the hill, and to the nozzle pump on the top. Power is generated by means of a Premier gas engine, whose normal load is 360 B.H.P. at 4.000 feet altitude, the bas being generated from bituminous nut coal in a plant made by the Power Gas Corporation. During the test run in July this engine developed up to 390 B.H.P., consuming an average of about 1¼ lbs. of bituminous nut coal per B.H.P. hour. This plant is of peculiar interest, as it is the first gas engine running on bituminous coal in South Africa, and, besides being the largest gas engine running in the country, it has proved the possibility of producing cheaper power on a moderate scale than has hitherto been attained anywhere in this country, except in some cases from water power. Since the commencement of this mine in 1907 up to the 31st December, 1911, the total profits have been £131,920 10s., whilst the gross capital expenditure has been £59.154; so that for the period of its existence the Groenfontein Tin Mine has repaid its capital expenditure and shown a surplus of £72.466 10s., with the existing plant still remaining as an asset. Owing to the erratic nature of the occurrence of tin in this deposit, it is (as has been pointed out in former reports) impossible to develop any tonnage of ore in the mine, and the only possible ore reserves are in the form of dumped ore at grass. It is not surprising, therefore, that there should come a time when—through a number of impoverishments occurring more or less together—the dumps themselves become exhausted. This having actually occurred at Groenfontein, the policy has been now adopted of running the mill to produce, as far as possible, only sufficient concentrates to cover current reduced expenditure until such time as the accumulation of ore reserves, and the disclosure of further ore bodies by prospecting, again warrant work on a large scale.

LATEST FROM THE PILGRIMS REST GOLDFIELDS.

Increasing Activity on Several Properties.

[From our Correspondent.

The activity referred to in these columns on several occasions increases every month. In the Pilgrims' Creek there are two new properties within an ace of crushing, the Welcome and the Pilgrims Creek G.M. Co. Both of these are the outcome of the new blood introduced from Oudtshoorn, which is finding vent for much capital in several ventures here, notably these two properties, Mac Mac and the Little Octopus, at the head of the Creek. Returns this last two months have been down a little owing to various causes. The torrential downpours on several occasions have caused stoppages both here and at Sabie. Several mines, as, for instance, the R. Burnham Syndicate, have been installing new plant. This mine has just put down a new gas engine. Messrs. Begbie, of Middelburg, have had this matter in hand, and have carried the work out satisfactorily. The Little Octopus mill has been closed down for the purpose of re-setting the cement bed for the engine. Prospects just now are very rosy. It is extremely probable that S.E. Africa will take up their Mali Dyke option. They have also the option over a rich strike opened up lately adjoining the Mali Dyke, and have acquired the extension of the reef from the discoverers. The C.B.M. Syndicate has been formed to take over the workings that Capt. Cornwall has so manfully stuck to for so long at Ledophine. As the name implies, it is the Cornwall, Burnham, and Munro Syndicate. This is one more example of the way the small man keeps his money in a district. The Sunlight property on the Granite seems at a standstill owing to disagreement in the management. Mr. R. Sutherland, Consulting Mining Engineer, late assistant manager of the T.G.M.E., was down in the Low Country to report lately, and struck some good reefs. There would seem to be good possibilities down there. Both Sunlight and Rietfontein (T.C.L.) have good prospects if well worked. The Mac Mac Syndicate, which represents more Oudtshoorn capital, is opening up well on the top claims. They have to declare their Mynpacht shortly, I hear, as have several other companies. The pegging at Elandsdrift passed off quietly. The sandstones at Sabie are still unfloated, though rumours circulate, and Sir Abe Bailey's name is freely mentioned. Mr. E. G. Pritchard, of Cape Town, Consulting Mining Engineer, has been down again. He represents some strong syndicate in London, I believe, but it is difficult to ascertain. It is, however, on the tapis that he will be the means of bringing in some big capital at an early date. The Glynn power failed a fortnight ago as a result of the storms, and held up several properties which use electric power. It is very evident that a new intake is needed, as the present one makes a dam of the drift over the Sabie River close to the hotel, causing damage to transport goods. Rietfontein, by the way, is putting down two Nissen stamps, so we shall see them running locally. There have been several enquiries as to who are the agents for these mills. Mr. Rundle, engineer to the S.E. Africa, Ltd., is making a prolonged stay at Mali Dyke to thoroughly gauge the possibilities there.

A case of five specimens from several mines here was sent down to Oudtshoorn recently, and is to be seen in the Bank there. This should mean some new capital coming along. It is proposed, I hear, to send the case on a tour round the country to show mining men what sort of reef we have here. In view of the many attempts to bluff people by such means, it is hoped that the Syndicate responsible for this case have seen that a man, whose reputation is known, is in charge of the tour. It is remarkable that there is not a single instance of a failure here due to the reef being poor or pinching out. All apparent failures are due to want of capital or other causes. This is instanced in the Mac Mac Syndicate and the Pilgrims' Creek G.M. Co., both of which are going ahead again, and the Sunlight, which is very hopeful. The T.G.M.E. are carrying out many new improvements, notably the two tube mills, compressor plant, and the electrifying of the Jubilee Line. The Desire mine, which reverted to them lately, will soon be adding its share to the grand total. The labour outlook is improving on the small mines, and the failure of the mealie crop in the Low Veld will bring out many boys shortly. The railway should be in Sabie at the year end. It is hoped that there will not be more than four months' work after the rails arrive. These come round from the Fourteen Streams section. From Sabie to Graskop should not take more than a year from then, as it is not more than fifteen miles. The gangs come over this side in a week or two. The arrival of the line should cheapen working costs considerably, and make some, at present, highly speculative propositions less so. The preliminary survey of the township has just been completed, so we are moving along. This will mean a centre railhead right in the centre of the dolomite formation, and will give a big impetus to mining.

MINERS' PHTHISIS: COMPENSATION AND PREVENTION.

Points from the Report of the Australian Royal Commission.

The West Australian Royal Commission on tuberculosis reported, *inter alia*, as follows: We recommend (a) That before any man is employed for the first time in mining he should be in possession of a medical certificate stating that he was found to be sound in wind and limb, and physically fit to work in or on a mine. (b) That within three months after the passing of an Act every person employed in or about a mine shall be medically examined. (c) That it be made an offence for any owner or manager of a mine or treatment plant to employ a person without first having seen such a certificate. (d) That at intervals of six months the medical officer of the district make a general examination of each person employed in or on a mine. If the examination should detect the presence of a tuberculosis disease in any man, the medical officer shall immediately notify the fact (1) to the sufferer; (2) to the manager of the mine; and (3) to the Board of Health.

Pneumonoconiosis.

If tuberculosis, the most dangerous of the diseases which may supervene on pneumonoconiosis, were dealt with separately, the danger arising from the latter disease would be comparatively unimportant. Pneumonoconiosis alone has taken a much smaller hold in the metalliferous mines of Western Australia than those of America, South Africa, and some Australian States. We recommend, however, that, simultaneously with the medical examinations for tuberculosis, examinations be made by the same medical men, with a view to the early detection of intermediate pneumonoconiosis. That a sufferer detected shall cease to be employed in the mine or mill, and it shall be made an offence under the Act to employ him therein or theron. It will be understood that until the schemes for the employment of as many of the men excluded from the mines as are capable of other employment can be matured, the State must practically finance the Board.

A Warning.

A note of warning may be sounded. It is too much the fashion to assume that gold mines can stand anything in the way of exaction. This is far from being the case. The industry is in reality a very speculative and precarious one, and from time to time the investing public gets tired of it. The margin between profit and loss is often extremely narrow, and any undue disturbances would in such cases lead to liquidation for the owners and loss of employment for the working miners, and, which is even more serious, prospectors with new mines to develop would look in vain for the assistance of capital. Many mines have existed for years and achieved nothing beyond the regular payment of wages; not only have they received no interest on the expenditure of capital, but the capital itself has been swallowed up. The only attraction of mining for the speculative capitalist lies in the occasional prizes, which, after all, bear only a small proportion to the blanks. A light-hearted and indiscriminate ordering of expensive machinery for ventilation or any other purpose might cripple all but the richest of mines, and would be the death-knell of a great many that have not yet reached—if they ever will reach—the productive stage.

Relieving Sufferers.

The several interests calculated in the course of our investigations were found to hold different views on the question of how sufferers from pneumonoconiosis were to be dealt with. The miners' unions in the Kalgoorlie district were unanimous in thinking that the disease should be classed with accidents and dealt with under the Workers' Compensation Act, which provides that accidents are to be compensated for by the employer, although in practice this obligation is usually taken off the hands of the employers by insurance companies, to which they pay a stated premium. The Kalgoorlie unions were emphatic in their statements that "the industry"—the employers—should bear the brunt of such "accident," or pay the necessary premium to the insurance companies. The Gwalia Union, which held the same view as regards persons totally incapacitated, added the rider that "such as are able to work should be supplied by the State with work suitable to their condition of health." The president of the Mount Morgans Union considered that individuals incapacitated for mining should leave off mining before the disease had gone too far, and that the burden of their support or of finding suitable employment should be borne by the Government and the industry, but that the miners themselves should not be asked to contribute, as they were not in a position to do so, though they would if they could. The Murchison and Dawn Dawn Miners' Union did not believe in the Workers' Compensation Act scheme, but would provide compensation out of a tax on gold won. The industry should pay that way, but the men should not be asked to contribute. Men affected by dust should be given employment on light jobs in the mines or work on the land.

National Insurance.

The Chamber of Mines favoured a national insurance against pneumonoconiosis in which the premium on employees should be paid in equal proportions by (1) the employer, (2) the employee, and (3) the Government. This scheme was urged on the ground of the encouragement of the thrift involved. In New Zealand the Workers' Compensation Act, 1908, by which pneumonoconiosis was placed on a list of diseases which were to be treated as accidents, came into operation on January 1, 1909. Mine owners objected to this proposal unless a medical examination had previously ascertained that a workman on whose account they were to be liable was free from the disease. The miners declined to be thrown out of employment—no provision having been made for lighter employment or compensation—by a medical examination, which they held to be degrading. Insurance companies refused to take the risk without a preliminary medical examination. Finally the Government Insurance Department took over the risk at a premium increased from £2 9s. 6d. to £3 9s. 6d. per cent. on the wage paid, because on the inclusion of the new "accident," but only under a guarantee of indemnity by the Treasury. No claims were made during the twelve months that the Act was in force, the clause requiring the disease to have been contracted within the last twelve months having apparently prevented the maturing of claims capable of proof. On December 24, 1909, the Act was repealed as far as the classification of pneumonoconiosis as an accident was concerned. We hold that pneumonoconiosis is not an accident, and cannot be described as such without opening the door to interminable litigation. The outcome of the legislative experiment in New Zealand indicates that the project was found to be impracticable, and we are firmly convinced that the conclusion was justified in spite of the evident leaning towards the scheme on the part of a large section of the West Australian community, and in spite of the agitation in the same direction now prevalent in South Africa. Treatment of pneumonoconiosis as an accident would be an injustice to the mines.

German System Endorsed.

After careful consideration we have decided that the course open to the fewest objections is to class pneumonoconiosis (tuberculosis being eliminated and separately dealt with) with all other diseases, and provide for invalidity or death caused thereby, as by any other disease except tuberculosis, in a general scheme of industrial insurance. It is admitted on all hands that the German system of insurance against invalidity, sickness, old age and death has not only ameliorated the position of workmen, but has also brought about a stricter attention to the improvement of conditions affecting health and depending on sanitation at the special risks of certain avocations. It must be remembered that in this State mine-owners at present bear the entire burden of compensation for accidents, and we do not propose to interfere with this state of things. In our opinion, it is, however, imperative that the line of demarcation between genuine accidents and diseases which could only be called accidents by a transparent legal fiction should strictly be maintained. Insurance against pneumonoconiosis or any other disease is in the department of "life" and not "accident" insurance. A measure on lines somewhat similar to the German legislation is now before the British House of Commons. We are in sympathy with the spirit of this measure as regards its most important features, but we do not propose to extend the operation of insurance to old age and unemployment. We recommend the institution of a mining insurance trust, with the specific object of securing that all workers in or on mines or treatment plants be assured of substantial benefits in the event of invalidity, sickness or death, whether arising out of the nature of their calling or from other causes. That every man working in or on mines or treatment plants on wages or contract shall contribute one-third of the total premium due on his behalf, to be deducted from his wages or earnings. That the owners of mines or treatment plants shall contribute for each man employed one-third of the total premium. That the Government shall contribute to the insurance trust the remaining third of the total premium.

Land for Ex-Miners.

It is impossible, without some experience and a thorough actuarial investigation, to lay down the exact amount of compensation to be paid to the contributing workmen under the insurance scheme. Each one should be dealt with on its own merits, with due regard to the amount of the fund available. We recommend the employment of miners incapacitated for continued underground work, by the effect of dust on the lungs, by settlement on the land. There is plenty of suitable land in the State only waiting for occupation, and its settlement and utilisation would benefit the community at large. The Agricultural Bank should make advances to such nominees. When a portion of land is set aside for the occupation and use of any claimant on the insurance fund, the fund shall be relieved of his claim wholly or partly at the discretion of the Board.

Glynn's Lydenburg.

The following is the March output of the Glynn's Lydenburg:—Tons crushed, 3,177; yielding 1,877 ozs. fine gold, valued at £7,834; estimated profit for the month, £4,593.

RESULTS FROM THE NEW PRIMROSE.

A Prosperous Year—Improved Profits—Bigger Tonnage and Lower Costs.

THE revenue of the New Primrose during 1911 was: From gold, £426,933 19s. 2d.; from other sources, £5,533 7s. 1d.; total, £432,467 6s. 3d.; balance from last account, £42,034 3s. 7d.; total, £474,501 9s. 10d. Expenditure: Working costs and general expenses, £214,809 0s. 9d.; dividends and bonus, £227,500; donations, £350; contribution to Miners' Phthisis Sanatorium, £168 7s. 2d.; Miners' Phthisis Allowances Act, 1911—amount claimed and paid under the Act, £200 0s. 5d.; profits tax, £17,347 2s.; depreciation as per balance sheet, £5,587 11s. 10d.; total, £465,962 2s. 2d.; balance to next account, £8,539 7s. 8d.

CONSULTING ENGINEER'S ANNUAL REPORT.

Mr. J. G. Lawn, the Consulting Engineer, writes :—The year 1911 has been a prosperous one as far as the New Primrose Mine is concerned. The profits, which attained a high level in 1910, showed a further slight increase, the figures for the year amounting to £217,658. There was an increase in the tonnage crushed of 24,480 tons, and working costs were reduced by over one shilling per ton, which enabled the grade to be reduced whilst maintaining the profit, and consequently the recovery value was lower by 2.356 shillings per ton. The treatment of the old slimes accumulations was carried on without intermission, and resulted in a profit of £18,515 being realised from this source. The May Deep shaft was closed down during the year in order to reduce working costs. The available tonnage in this section of the mine is now large, and it can be more economically worked from the Moss Rose section. The development of the southern series was actively carried on during the year. The results achieved, taken as a whole, have been satisfactory. The drives in the vicinity of the Primrose shaft at first exposed payable values, but as the levels extended further from the shaft the grade fell below the pay limit. Our experience in this series was more fortunate in the neighbourhood of the Moss Rose shaft, and here a considerable body of reef of fair average value has been exposed. A considerable quantity of reef was drawn from the old workings during the year, and the reopening of old levels and prospecting in the older sections of the mine, yielded most gratifying results. The payable ore reserves were re-estimated at the end of the year, and now stand at 423,311 milling tons, of an estimated recovery value of 6.7 dwts. The ore reserves do not include a large tonnage of reef which is available in the old workings, but of which it is difficult to estimate the amount and value. Mr. R. Clarkson resigned his position as manager at the 31st July, and Mr. J. L. van Eyssen was appointed to the vacancy.

MANAGER'S ANNUAL REPORT

The Manager writes, *inter alia* :—Development work was confined chiefly to proving the southern series and the large block of unworked Main Reef on the western side of the property. While the values obtained in the latter were chiefly of a patchy nature, still there is good reason to think that at least one large block of payable Main Reef, between the 10th and 12th levels, will be established, and this will not only justify all the exploratory work undertaken in this section, but will also more than pay for it. In addition to this, these drives on Main Reef supply an excellent and safe means of reclaiming the old South Reef stopes above, without the enormous cost of reopening all the caved South Reef drives. Development on the southern series, and particularly in that section which lies between the Primrose and Moss Rose vertical shafts, has exposed very encouraging results, and added 46,857 tons of payable ore to the reserve. Other development work has been more of an exploratory nature, and consisted for the most part of rising and winzing. This work especially has exposed some remarkably valuable patches and blocks of ore, chiefly in the form of overlaps. The average number of machines developing during the year was (a) large 6.85, (b) small 1.10. Some footage was accomplished by hand labour. The total footage driven, risen and sunk was 6,609 feet, the various reefs being represented as follows :—Main Reef : 1,432 ft. driven, 629 ft. risen, 199 ft. sunk, total 2,260 ft.; Main Reef Leader : 116 ft. risen, 93 ft. sunk, total, 209 ft.; South Reef : 215 ft. driven, 526 ft. risen, 105 ft. sunk, total, 846 ft.; Southern Series : 2,375 ft. driven, 603 ft. risen, 316 ft. sunk, total, 3,294 ft.—totals, 4,022 ft. driven, 1,874 ft. risen, 713 ft. sunk, total, 6,609 ft. The ore developed by this footage was 37,363 tons. Old Workings.—The old workings are steadily being reclaimed, and the exploratory work is proving the existence of a very considerable asset. During the year 87,462 tons of ore were milled from there, and this figure should be exceeded in following years.

PROSPECTS OF THE CONSOLIDATED LANGLAAGTE.

Development of the Southern Section—Results for the Past Year—Progress of Construction Work.

The revenue of the Consolidated Langlaagte in 1911 was: From gold, £312,089 3s.; from other sources, £2,511 17s. 11d.; total, £314,601 0s. 11d.; add balance from last year, £260,714 2s. 1d.; total, £575,315 3s. Expenditure: Working costs and general expenses, £229,933 12s. 11d.; donations, £150; premium on redeemed debentures, £750; debenture interest, £6,000; debenture expenses, £266 11s. 6d.; interest on loan, £8,452 16s. 2d.; contribution to Miners' Phthisis Sanatorium, £244 9s. 3d.; Miners' Phthisis Allowances Act, 1911—amount claimed and paid under the Act, £333 19s. 10d.; profits tax, £4,129 6s.; depreciation on stores, £850; depreciation and loss on share investments, £12,551 2s. 4d.; profits appropriated, £226,885 3s. 1d.; total, £490,547; balance to next account, £84,768.

Consulting Engineer's Annual Report.

Mr. J. G. Lawn, consulting engineer, writes:—During the earlier part of the year profits were considerably reduced owing to a drop in grade. For the first half of the year the monthly profit averaged less than £6,000, whereas for the remaining six months the monthly average was over £8,000. It was not found possible to improve the grade to any extent, but economies were effected in several directions, with the result that working costs were reduced by nearly two shillings per ton of ore milled, and the total gross profit realised amounted to £84.667. Fluctuations in the native labour supply were experienced throughout the year, and this interfered to a large extent with the regular supply of ore to the mill, so that the tonnage crushed was less than that for 1910 by 23,926 tons. A good deal of development work was carried on in the ground to the west of the Star shaft. Here a series of faults has caused considerable displacements of the reef, and a large amount of crosscutting was necessary. The development of the South Reef in the Croesus section was practically completed, but a fair amount of driving still remains to be accomplished in the Star section. Reef of average value has been exposed, and some promising patches of Main Reef Leader have also been opened up. The payable ore reserves in the outcrop mine at the 31st December, 1911, stood at 397,017 tons of an estimated recovery value of 5.9 dwts. Southern Section.—The development of the large area of ground south of the Ferreira-Crown Deep Dyke was proceeded with throughout the year without interruption. Excellent progress has been made, the total development footage accomplished amounting to 32,084 feet. The East shaft has reached a depth of 252 feet below the sixth level, and the West shaft was sunk to a depth of 246 feel below the seventh level. Both shafts are being continued. Development has been carried on on both the South Reef and Main Reef Leader. On the former reef the value of the ore exposed has been very satisfactory, and it has been found necessary to reject only a small percentage as unpayable. The values of the Main Reef Leader have been more erratic, but our experience to date has shown that the percentage payability of this reef is higher in the ground to the south of the dyke than is the case in the outcrop mine. During the year the amount and approximately the value of ore developed was estimated month by month from the footage driven on reef. A careful calculation has now been made on the basis of block values in so far as this method was applicable. In making this calculation it has been necessary to include in certain blocks a quantity of ore which had previously been classed as unpayable. In some instances, also, it has been found that the stoping width can be taken with profit at a greater width than was previously assumed. Taking these two factors into consideration, the effect has been to increase the total tonnage of ore developed and to slightly lower the grade. The recalculation shows the payable ore reserves to amount to 1,222,630 tons of an assay value of 8.2 dwts. The stoping width works out at an average of 47 inches. Until a little experience has been gained of stoping in the new mine, and of the working of the new plant, it is difficult to say just what the extraction value of the ore reserves in this section will amount to, but it should be somewhere in the neighbourhood of 6.9 dwts. The scheme of surface equipment in connection with the southern section was decided upon during the year, and the construction work has been put in hand. The scheme includes the erection of a crushing and sorting station, a new mill of 100 stamps, each weighing 1,900 lbs., and ten tube mills, with the necessary additions to the cyanide treatment plant. The stamps and tube mills will be electrically driven, and electric hoists, designed on the Ward-Leonard system, will be installed at the East and West shafts. A 50-drill electrically-driven compressor is also on order, and will be erected at the East shaft. The new reduction plant is designed for a crushing capacity of 45,000 tons per month. The erection of the plant is making satisfactory progress, and, provided there are no delays owing to late arrival of machinery, there is every prospect of the whole of the work being completed and the new mill ready for the middle of the year. General.—The development of the Southern section has yielded gratifying results, and at the end of the year the total payable ore reserves in the two sections of the mine amounted to 1,619,647 tons of an average recovery of 6.7 dwts. By the time the new reduction works are ready the reserves should be somewhere in the neighbourhood of 2,000,000 tons, so that the new era in the life of the mine will commence under favourable auspices, and, given sufficient labour, a bright future may be confidently anticipated.

Manager's Annual Report.

The Manager writes, *inter alia*:—Southern Section of the Mine.—Work in this section during the year has been confined to shaft sinking and development. 70,479 tons of ore from development and 68,531 tons of waste have been hoisted up the East and West shafts. Of the 70.479 tons of ore from development, 25,886 tons have been milled at the outcrop section of the mine. East Shaft.—During the year the East shaft has been sunk 661 feet to a depth of 1,917 feet from the surface. The 5th and 6th levels have been opened up and the shaft had reached 252 feet below the latter level at the end of the year. The 2nd level ore bin has been equipped for the two western winding compartments and is ready for use. The front of the 5th level ore bin over the four winding compartments, together with loading shoots, has been completed, and connection has been made with the 4th and 3rd levels, so that all the ore down to the 5th level can be handled by means of these two ore bins. Brow bins have been established over the eastern winding compartments at the 4th, 5th and 6th stations. At the 5th station, an auxiliary air hoist has been erected for shaft sinking purposes, and, by means of a crosscut under the shaft at this level, all rock broken below this point in shaft sinking is handled at the brow bin on the station. The bearers have been fixed at the end of the curve and the two western compartments in the curve have been equipped with rails and guides round to the vertical portion of the shaft for the large ore skips, thus completing the equipment of all four compartments. The equipment includes the installation of a 12in. air main. The West shaft has been sunk 823 feet to a depth of 2,175 feet from the surface. The 5th, 6th and 7th levels have been opened up and the shaft had reached 246 feet below the 7th level at the end of the year. The fourth ore bin was connected with the shaft and equipped with loading shoots over the two eastern compartments, and brow bins were erected at the 5th, 6th and 7th stations. An auxiliary air hoist was established at the 6th station and will deal with the rock from shaft sinking below this point as described in the case of the East shaft. All four winding compartments round the curve have been equipped with rails and guides, and the four hauling ways are being carried down the incline fully equipped. A 12in. air main was also installed in this shaft. In both shafts the work of crosscutting for stations and sumps, together with the cutting of stations, sumps and ore bins, was charged to shaft sinking. The amount of work done was 594 feet of crosscutting and 443.5 cubic fathoms. The total expenditure on shaft sinking and equipment amounted to £52,129 7s. 4d. Pumping.—During the year a permanent pump chamber and sump were cut at the 2nd level station in the East shaft. Two pumps, with a maximum pumping capacity of 720,000 gallons in 24 hours, have been installed, together with all the necessary electrical gear for driving them. At the 5th station in the East shaft, a small electrically-driven pump, taken from the outcrop section of the mine, has been installed, and a small sump cut out in the bottom of the crosscut. In the West shaft small sumps have been cut in the shaft at the 4th, 5th and 6th stations, and the water is being pumped up by air-driven pumps to the 3rd level, whence it gravitates to the 5th level electrically-driven pump at the East shaft. The expenditure on pump chambers, plant and equipment amounted to £6.515 13s. 11d. Development. The work of development in the east and west sections has been pushed on with all possible speed during the year. The complement of labour necessary was maintained from the outcrop section of the mine, as well as by recruiting special boys for development, tramming and shovelling work. At the commencement of the year there were 431 boys employed underground in this section, and at the end of the year there were 967, making an average of 657 boys for the year. The total footage of development accomplished during the year, inclusive of rising, winzing and crosscutting, amounts to 32,084 feet. The amount of driving along the reefs at the various levels was as follows: East Shaft Section: First level, Main Reef Leader, 79 ft., South Reef, 344 ft.; second level, Main Reef Leader, 1,669 ft., South Reef 1,899 ft.; third level, Main Reef Leader, 2,310 ft., South Reef, 1,981 ft.; fourth level, Main Reef Leader, 2,258 ft., South Reef, 1,902 ft.; fifth level, Main Reef Leader, 1,690 ft., South Reef, 644 ft.; sixth level, Main Reef Leader, 153 ft., South Reef, 17 ft.; totals, Main Reef Leader, 8,159 ft., South Reef, 6.787 ft. West Shaft Section: Third level, South Reef, 1.745 ft.: fourth level, Main Reef Leader, 1,330 ft., South Reef, 2.116 ft.; fifth level, South Reef, 1,887 ft.; sixth level, Main Reef Leader, 888 ft., South Reef, 1,754 ft.: totals, Main Reef Leader, 2.218 ft., South Reef, 6,902 ft. The amount of driving actually on reef totalled 20,004 feet. Of this, 8,951 feet were on Main Reef Leader, and 11,053 feet on South Reef. Of the driving on Main Reef Leader, 50.27 per cent. was payable; and of the driving on South Reef 72.84 per cent. The length of the backs in the southern section range from 220 feet to 300 feet. A large number of winzes are being sunk, and by the 1st July there will be at least 44 completed, so that the number of stope faces available in the two sections of the mine should be ample for the requirements of the new mill. Work on the first level was carried out from a crosscut through the main dyke from the ninth level of the outcrop section of the mine. The dip of the reef at this level being steeper than below, gives indication that the backs above the first level will be considerably larger than was anticipated at one time. All the other development has been done from one or other of the deep level shafts. In the upper levels, no doubt partly owing to proximity to the Ferreira-Crown Deep dyke, a considerable amount of faulting has been met with, but this probably tends to decrease in depth. As will be seen, development has been most extensive at the East shaft, where values are better than at the West shaft. The latter section of the mine, however, has considerable sections of payable South Reef; and though the Main Reef Leader is not so good as in the East shaft section, yet it will without doubt yield a considerable tonnage for the mill. Taken on the whole, the development in the southern section of the mine has been very gratifying. The total expenditure on development for the year amounted to £110,915 10s. 9d. Surface Equipment.—In the year under consideration, the old surface plant has been kept in repair, and certain portions of the new plant have been erected. The slimes plant was considerably enlarged in order that the increased capacity could be utilised to treat accumulated slime, before the plant was required for the increased tonnage which the new mill will crush. The acid house was enlarged, a smelting house for cyanide gold was erected, and a cyanide solution heater was installed. These all helped in improving extraction, and in reducing working costs during the year. A change house for tropical natives has been erected at the East shaft, and is working satisfactorily. The transformer house has been extended commensurate with the requirements of power to be purchased from the Victoria Falls Power Company. Three staff houses, 20 workmen's cottages and a new boarding-house for employees have been erected. A second 50-drill compressor, together with an extension to the boiler plant, condenser and economiser, were added to the East shaft plant during the year. Certain other expenditure is being incurred in surface works, which are not yet completed. These are the erection of electrically-driven hoists at the East and West shafts respectively; the erection of headgear bins at the East and West shafts; new crushing, sorting and conveyor plant; 100-stamp mill; tube mill plant; extension to sands plant, store, building, workshops and general offices, together with certain extensions to water service, roads and surface lighting. Labour Supply and General.—There has been an average of 2,708 boys on the books of the company throughout the year, being a decrease of 216 over the previous year. 3.3 per cent. have been absent through sickness; the death rate from sickness for the year has been 9.6 per 1,000 per annum, of which over one-third was due to tuberculosis in some form. The death-rate from accidents in the mine was 2.2 per 1,000 per annum making a total death-rate of 11.8 per 1,000 per annum. At the end of the year there were 406 Europeans and 3,389 coloured persons employed on the mine; a large number of both Europeans and coloured persons were being employed on construction work.

THE POSITION OF THE KOLMANSKOP DIAMONDS.

Points from Annual Report—Decreased Profits—Taxation Question.

The third annual meeting of the shareholders of the Kolmanskop Diamond Mines, Ltd., was held at Capetown, this week. Mr. F. Ginsberg presided. The annual report, which was submitted, contained the following information: Property.—Out of the total area of 4,100 hectares granted under the concession, 930 hectares have been prospected to date, and proved to be diamondiferous. Of this area about 110 hectares have been worked out, leaving about 820 hectares still to be worked. Labour.—Difficulty has again been experienced in connection with the supply of native labour, and drafts of boys had again to be obtained from Capetown. Recruiting fees and the cost of transporting the natives have been materially higher this year, and this is also reflected in higher working costs. Yield.—During the year 150,539 loads of sifted gravel were treated, yielding 147,234 carats, equal to about 1 carat per load. Attention is drawn to the remarks of the general manager with regard to the working of the Schiechel machines, and the results obtained therefrom. In connection with these machines, which produced the greater portion of this year's output, about 60,000 loads of debris has been washed yielding, approximately, 40,000 carats of diamonds, while about 60,000 loads of virgin ground yielded, approximately, 35,000 carats. The remainder of the output has been produced by the hand-washing machines, which to a certain extent will still be made use of in future owing to it being impossible to conveniently work certain not easily accessible parts of the property by the Schiechel machines. Working costs.—Directors wish to draw the attention of shareholders to the fact that the proportion of the mining of sand and transporting same has become a considerably heavier item during the past year. It is hoped that the expert's report referred to above will contain recommendations which will lead to a reduction of these items of working expenses. The attention of shareholders is drawn to the general manager's report dealing with this question. Assets.—The shares held by the company referred to in the last report have been sold, and realised £4,947 2s. 8d., which amount has been written off the value of the property. A small holding still remains which will be disposed of as opportunity offers. Profits and dividends.—The total profit for the year was £45,658 12s. 11d. An interim dividend of 15 per cent. was paid in August, 1911, and your directors now recommend a final dividend of 7½ per cent., making a total dividend of 22½ per cent. for the year. Your directors also propose, subject to the approval of shareholders, to appropriate from the balance of profits remaining a sum of £4,000 to the reserve fund, bringing that fund to a total of £16,250, and further, to provide a sum of £7,042 13s. 3d. for depreciation of buildings, machinery, etc., which will leave a balance of £7,776 11s. 3d. to be carried forward to next year's account. The chairman, in moving the adoption of the report, said he ventured to predict last year that in consequence of the introduction of up-to-date machinery, the output would show a substantial increase, and that working expenses per load would be reduced. He regretted to say his anticipations have not been realised, as would be observed from the statements and reports submitted.

The output during the year was 147,234 carats (146,659 carats in 1910), and therefore showed an increase of about 600 carats only as compared with 1910. The mine working expenses on the other hand showed a considerable increase, viz., £35,136 6s. 10d. as compared with £25,616 9s. 5d. in 1910. To produce the same quantity of diamonds they had therefore spent about £10,000 more in mine working expenses. The reasons for this great increase in working cost per carat was found in the following: (1) Increased cost of labour—averages about 3 marks per day per boy (this being 2.40 marks in 1910) or, say, 300 x 400 x 0. 60 pf.—72,000 marks, or £3,600. (2) The treatment of poorer gravel; this year averaging 0.981 carat per load against an average of 1.427 carat per load in 1910. (3) The difficulty in mining the deeper layers of gravel in a satisfactory manner. Another serious factor which had influenced the year's profit has been the lower price obtained for the output. The diamond sales account showed as follows: 1910, sales and in hand, £163,535 16s.; 1911, sales and in hand, £151,985 19s. 4d.; reduction, £11,549 16s. 8d. The aggregate of increased cost of production and the decrease in the price obtained was therefore about £21,500. He would also like to draw attention to the item "diamonds in hand," which had been taken in at a value of 16s. per carat. These diamonds had since been realised at an average price of about 21s. per carat, or about £3,300 in excess of the estimated nett amount. He begged to draw attention to the remarks contained in the report of the directors dealing with this question, and he was happy to inform those present that apparently the German Government had finally decided to transform the present export duty into a tax on profits. It was needless to enlarge upon the benefits which such a change would confer upon the company, and in fact the whole of the diamond industry in German south-west Africa. He would give an example under export duty as compared with the prospective change: 1 load gravel, containing, say, ½ carat of diamonds, the working of which would cost, say, 5s., and valuing the diamonds at, say, 20s. per carat, would yield a gross revenue to the company of 10s.; 48⅓ per cent., equal to 4s. 10d.; is payable in the shape of export duty and other imposts. With working expenses of 5s., a balance of 2d. per load on that class of material would result. Compared with this under the system of the contemplated nett taxation, the profit realised out of the working of one load of above-mentioned material would amount to 5s., that is the difference between the cost of working and the amount realised for the resulting diamonds. Supposing that the Government duty amounted to 50 per cent. of the profits, such material would leave a nett profit of 2s. 6d., or correspondingly less should the proportion demanded by the Government be higher.

Accounts.—The results of last year's working was as follows: Expenditure: mine expenses, £35,136 6s. 10d.; Government duty, licenses and rents, £70,114 14s. 7d.; sundry expenses, viz., travelling and legal expenses, head office expenses, bank exchange, and London, Hamburg and Berlin expenses, £1,914 16s. 2d.; depreciation provided for, £6,703 14s. 5d.; balance of preliminary expenses written off, £338 18s. 10d. It would be seen on the credit side that the principle of setting aside about 10 per cent. of the profit for reserve has been adhered to, and that a liberal amount has been carried forward in order to provide for any possble development that may be required as a result of the report of the expert.

The future.—Continuing, he said: Your directors have communicated with a gentleman of great expert knowledge, who has agreed to prepare a report on the present working methods, to make recommendations as to the future working, and also as to the value of the property. The report would be made after the return of that gentleman from Europe, and in the meantime prospecting operations prescribed by the expert would be carried out by the manager. The above course had been taken, partly in consequence of conflicting reports and statements as to the prospects of the company, and partly owing to the increase in the cost of production per carat, but chiefly in view of the future development of the large quantities of low grade gravel, the treatment of which, he trusted, would become a possibility as a result of the recommendations which the directors hoped to get from the expert in question.

THE YEAR WITH THE GINSBERG.

Points from the Consulting Engineer's and Manager's Reports.

In 1911 the Ginsberg revenue was: From gold, £201,291 4s. 1d.; from other sources, £2,443 6s. 11d.; total, £203,734 11s.; balance from last year, £23,975 19s. 1d.; total, £227,710 10s. 1d. Expenditure: Working costs and general expenses, £144,390 2s. 10d.; dividends Nos. 16 and 17s, £52,500; donations, £100; contribution, Miners' Phthisis Sanatorium, £111 18s. 4d.; Miners' Phthisis Allowances Act, 1911—amount claimed and paid under the Act, £127 2s. 6d.; profits tax, £3,061 8s.; depreciation as per balance sheet, £5,025 0s. 6d.; total, £205,315 12s. 2d.; leaving a balance to next account of £22,394 17s. 11d.

Consulting Engineer's Annual Report.

Mr. J. G. Lawn, Consulting Engineer, writes :—The record ot the year's work, as detailed in the Manager's Report, shows that the position at the mine is most satisfactory. Ore of slightly lower grade was mined during the year, but owing to a consideable increase in the percentage of waste sorted out, the recovery value was increased 1.414 shillings per ton, and, as working costs were maintained at the previous year's level, the total gross profit at £59,344 showed an increase of £8,894. The Ginsberg section of the mine was closed down for five months owing tu the necessity of retimbering the upper part of the Ginsberg shaft, so that the mill had to be kept running on ore drawn from the North (Balmoral) section, together with a small tonnage from an old development dump. It is worthy of note that there was no diminution in the profits realised during this period. The development of the Ginsberg section is practically completed, and operations were directed almost entirely to the opening up of the north section. Owing to the limited number of ends available, the amount of driving accomplished was small, but reef of satisfactory grade was exposed. No shaft sinking was carried on during the year. It has been ascertained, however, that the depth at which the North Reef is cut out by the East Rand Dyke is further to the south than was formerly thought to be the case. This is important, as it adds a considerable reef area to that previously calculated on and it will be necessary to sink the north shaft further. This work will be put in hand during the current year. A re-estimation of the ore reserves was made at the end of the year, and it is calculated that the developed ore amounts to 367,646 tons of an estimated recovery value of 6.8 dwts. A considerable quantity of ore was mined during the year which did not deplete the measured reserves. The installation of a tube mill, reference to which was made in my last annual report, was carried out during the year, but unfortunately the Victoria Falls Company was unable to supply the mine with electric power by the time arranged, and we were unable to run the plant. Since the end of the year, the requisite supply has been forthcoming, and it is anticipated that during the current year benefit will be experienced from the running of the tube mill, both in the matter of improved extraction and increased tonnage.

Manager's Annual Report.

The Manager, Mr. E. Hay, writes, *inter alia* :—Underground Work.—Main Shaft: During the year, owing to the decayed condition of the timber in the upper portion of this shaft, it became necessary to carry out extensive retimbering work between surface and the 2nd level. On account of the very heavy nature of the ground passed through, this work proved to be both slow and expensive. It is now completed, however, and the shaft is in good order. During the time that this retimbering work was in progress, no ore was drawn from the Ginsberg section, the mill being supplied withs rock from the north section. North Section.—The equipment of this shaft was maintained in working order. Various repairs to the shaft timber were carried out. West Shaft. The equipment of this shaft was maintained in working order. Development.—The total footage risen, driven and sunk during the year amounts to 2,197 feet. The ore developed by this footage was 72,173 tons. The average number of rock drills employed on development was 1.981. Ginsberg Section.—Development was confined to driving the 10th level, to sinking winzes from the 8th level, and to rising from the 9th level. North Section.—Development work consisted of driving the 4th, intermediate 6th and 7th levels, of sinking winzes from the 5th, 6th, 7th and 8th levels, and of rising from the 8th level; with the exception of the 4th level east, where the values are somewhat low, the grade of the ore exposed is, generally speaking, satisfactory, particularly in the section east of the north shaft. Mining.—The two sections of the mine have contributed to the total output of ore as follows:—Ginsberg section, 26,966 tons (percentage, 14.58); north section, 157,983 (percentage, 85.42); total, 184,949 (percentage, 100). In addition to the above, 15,119 tons were obtained from the Ginsberg development dump, making the total quantity of ore sent to the sorting and crushing station 200,068 tons. The tonnage mined was obtained by machine stoping, hand stoping and development, in the following proportions: Machine stoping, 70,562 tons (percentage, 38.15); hand stoping, 106,858 tons (percentage, 57.78); development, 7,529 tons (percentage, 4.07). During the previous year, the proportion of rock mined by machines was only 18.28 per cent., and it will be seen, on reference to the above figures, that the scale of machine stoping has increased very appreciably. This, of course, is due to the shortage of native labour. The average number of machines employed in the stopes was as follows: Large machines, 7.92; small machines, 6.44; jack hammers, .38; total, 14.74. Jack hammers were brought into use only towards the end of the year. Reduction Works.—The average value of the charges was 2.126 dwts., and of the residues .283 dwt. 7.52 per cent. of the total gold in the ore was recovered by the slime plant. Extraction.—The total yield, as the result of the year's work, amounts to 47,406.916 ozs. of fine gold, valued at £201,291 4s. 1d. This is equivalent to 6.848 dwts per ton milled, and represents 91 per cent. of the total value of the ore treated, which shows an improvement of 6.66 per cent. as compared with the extraction obtained during the previous year. Machinery and Plant.—Somewhat extensive repairs to the surface equipment have been necessary during the year. These have now been practically completed, and all machinery is in efficient running order, and the plant and buildings are in good condition. A 20-drill air compressor has been erected to augment our supply of compressed air—a step rendered necessary by the shortage of native labour and consequent increased scale of machine stoping. A 22ft. x 5ft. 6in. tube mill, fitted with Osborn liners, has been installed, with the object of regrinding the coarser product from the mill, and thereby improving the extraction in the reduction works. In connection with this plant, a 5in. Allen electrically-driven centrifugal pump, a classifying cone, and a plate house, containing three fixed amalgamating tables, have been provided. To deal with the larger tonnage of slime which the tube mill will produce, a 40 feet slime tank has been added to the slime plant, and a new 5in. solution service has been installed. The mine has suffered throughout the year from a shortage of native labour, and in many stopes, which, under normal conditions, would have been worked by hand labour, machines have been in operation. The effect of this is not only to lower the grade by the extra width broken, but also to increase the cost of mining, due to the steep dip of this mine, which makes machine stoping uneconomical.

Kolmanskop Diamonds.

The output of diamonds from the Kolmanskop Diamond Mine at Luderitzbucht for the month of March was 12,172 carats.

East Rand Deep.

Presiding at the annual meeting of the East Rand Deeps last week, Mr. Julius Jeppe, the chairman, said, *inter alia* :—The amount received for interest on investments is less by £78 14s. 5d., accounted for by the decrease in assets, and the receipts from rentals are also slightly less. The debit balance for the year is therefore £1,334 7s. 5d., principally owing to depreciation in the value of stock, the ordinary revenue being only about £279 less than your ordinary expenditure, and the total balance at debit of revenue and expenditure account on the 31st December last was £2,261 14s. 2d. The year which we are reviewing has not offered any opportunity for dealing with your property, but you may rest assured that when times are favourable your directors will use every endeavour to turn your valuable property to profitable account; it costs comparatively little to keep it intact, and in the meantime, the development in surrounding properties adds every year to our knowledge regarding the value of the reefs which pass through your claims. I referred last year to the theory that the Main Reef series passed through your property as sub-outcrops at a comparatively shallow depth instead of as the deep level; this theory has not been proved, but as during the year work has been proceeding in the neighbourhood, your board did not deem it advisable to incur any extraordinary expense, preferring to await events. It may, however, during the coming year, be advisable, when more data has been accumulated, to spend the necessary amount for certain exploitary work, particularly if the markets become favourable for raising further capital for the development and equipment of a mine. In this connection, I may remind you that the bore-hole which was sunk on the northern boundary of your property in December, 1903, struck a reef at a depth of 2,529 feet, which was 47 inches in thickness, the last 16 inches of which assayed 8 dwts. If this reef be not the Main Reef, as some allege, and you have the latter series in addition, then indeed your property is a very valuable one.

THE YEAR WITH "KNIGHTS."

A Period of Varied Fortunes, "Brighter Towards the End."

At the Witwatersrand the 1911 revenue was as follows: From gold, £445,110 3s. 10d.; from other sources, £22,393 10s. 5d.; total, £467,503 14s. 3d.; balance from last account, £138,726 11s. 11d.; total, £606,230 6s. 2d. Expenditure: Working costs and general expenses, £293,811 2s. 2d.; dividends, £148,750; donations, £350; contribution, Miners' Phthisis Sanatorium, £334 11s. 3d.; Miners' Phthisis Allowances Act, 1911—amount claimed and paid under the Act, £328 16s. 1d.; profits tax, £11,372 16s.; depreciation as per balance sheet, £14,541 7s. 11d.; expenditure on shaft sinking, etc., southern section, £96,042 15s.; total, £565,531 8s. 5d.; balance to next account, £40,69· 17s. 9d.

Consulting Engineer's Annual Report.

The Consulting Engineer writes:—Although the fortunes of the Company were somewhat varied during the past year, they brightened considerably towards the end of that period. In the early part of the year, profits fell away, until in July a minimum was reached, since when they have improved, and would have been better during the last two months of the year had it not been for a severe shortage in native labour, which has happily been now overcome. Working costs were about sevenpence per ton higher than during the previous year, owing to a considerable increase in the amount of development accomplished and also in part to an increase in the percentage of waste sorted out. Nothwithstanding the greater proportion of waste discarded, the grade of the ore milled was lower by 1.465 shillings per ton, and as the tonnage crushed was reduced by 10,169 tons the total gross profit showed a decrease for the year of £16,375. The north-west section of the mine was opened up in the early part of the year, after having been dammed off for some two years from the rest of the mine. The transport of ore from this section has been much facilitated by the driving of a cross-cut from the west shaft at the fifth level. The development of the southern section of the mine made considerable progress during the year. The vertical shaft attained a depth of 944 feet, and the permanent equipment of the shaft was well advanced, though not quite completed. The northern incline shaft was sunk 744.5 feet and the 13th level (the first level in the northern section) was started. Although the reef is a good deal faulted at this level, it is very thick and of quite satisfactory value. Indeed the results so far attained in the upper part of this section are distinctly gratifying. The payable ore reserves were re-estimated at the end of the year, and were calculated to amount to 1,225,084 tons of an estimated recovery value of 5.65 dwts. In addition to this tonnage there is a large quantity of low-grade Main Reef and Bastard, about which we have not sufficient information to enable us to include it in the ore reserves. It is, however, certain that a portion of it will prove payable. Mr. F. B. Lewis has been appointed manager of the mine is succession to Mr. W. M. Prout, who resigned in July.

Manager's Annual Report.

The Manager, Mr. F. B. Lewis, writes, *inter alia*:—Main, West, Central, East and North Shafts.—No new work has been done in these shafts during the year. Northern Incline Shaft.—This shaft has been sunk to a depth of 772.5 feet below the main crosscut on the 12th level, main shaft—of this footage 744.5 feet have been sunk during the year. This shaft has also been taken to a point 113 feet above the 12th crosscut, of which 73 feet have been risen this year. This provides room for the rope pulleys above the bins. The shaft is now 203 feet below the 13th level, this station having been cut and a waste bin put in. The ore bin is being installed. The engine chamber is also now in course of excavation to receive the permanent electric hoisting engine. Vertical Shaft.—This shaft has been sunk to a depth of 944 feet, of which 920 feet have been accomplished during the year. The permanent headgear and hoisting engines were put into use during December and are in satisfactoy running order. Very little water has so far been encountered. Development.—South Series: A total of 2,796 feet has been accomplished on this series, including 800 feet driven on reef, 1,338.5 feet crosscut, 221 feet risen, and 509.5 feet sunk. The large amount of crosscutting is partly due to the opening up of the north-western section of the mine on and above the 5th level. This ground has been practically untouched and shows very promising values. The section served by the north-west shaft, which was flooded in 1909 and since closed, has also been tapped by this crosscut through a short drive east. A considerable amount of crosscutting has also been done on the 13th level from the northern incline shaft. A 600 feet crosscut will shortly connect this point with the middle series, central shaft. The reef is very faulted in this locality and is encountered on less than six times in the crosscut. At several points it is of good value and width. Middle Series: A total of 3,405.5 feet, including 1,717.5 feet driving on reef, 302.5 feet of crosscutting, 302 feet rising, and 1,083.5 feet winzing, was accomplished in this section. Most of the driving and crosscutting has been confined to the 11th, 12th and 13th west drives. At the 13th level the reef was of fair value, and at the other two levels excellent values were met with; the winzes between the latter levels being equally good. North Series: Work in this section has been practically confined to the 5th level, which was opened up by the above-mentioned crosscut from the south series. 1,319.5 feet of development has been accomplished, including 599.5 feet of driving on reef, 368.5 feet crosscutting, 158 feet of rising, and 223.5 feet of winzing. Totals: A total of 7,551 feet has been developed, of which 1,886.5 feet has been accomplished on the 5th level, 2,073 feet on the 12th and 1,245 feet on the 13th level. The ore developed by this footage was 214,051 tons. The waste sorted out during the first six months of the year amounted to 18.5 per cent. During the last six months this was increased to 29.5 per cent. During the latter part of the year the number of machines on the stope faces was reduced as much as possible, while the number of jack hammer drills on the footwall reefs was considerably increased. Shortage of native labour during the last two months of the year accounts for the falling off in the tonnage mined during these months. The machinery and plant generally has been maintained in good repair. All three winding engines at the main, west and central shafts failed in the drums during the year. New drum-cheeks of a stronger design have been fitted to each. Five of the old type Lancashire boilers have been condemned, and are shortly to be replaced by a new Babcock and Wilcox boiler. Vertical shaft: A concrete collar set was put in early in the year, and a temporary headgear and engine put in for sinking. These were replaced during November by the new steel headgear and permanent winding engines. Four new Babcock and Wilcox boilers giving 1,400 h.p. and economisers have been installed, and a Robey 50-drill compressor is in course of erection. A siding from Delmore Station, supplying coal to the steel bunkers, which are almost completed, has been put in. A drill-sharpening shop has been erected, and is now in use. A change house is in course of erection. Native Labour: Labour both at the beginning and end of the year has been scarce, the shortage being particularly marked during the last two months of the year. Natives are now beginning to come in freely, however. In view of the extra boys required for the vertical shaft and the extra sorting now being done, more boys are required than can conveniently be accommodated in the compound, which will be enlarged to meet the new requiremnts.

Roberts Victor Diamonds.

The output from the Roberts Victor Diamond Mine in the Orange Free State for the month of March was 7,847 carats, recovered from 20,971 loads washed.

Natal Coal Returns.

The official coal returns for Natal Province for February are as follows:—Natal Navigation, 30,383 tons; Durban Navigation, 24,424 tons; Hlobane, 22,618 tons; Burnside, 19,941 tons; Elandslaagte, 18,758 tons; St. George's, 17,493 tons; Glencoe (Natal), 15,558 tons; Utrecht, 13,701 tons; Natal Cambrian, 13,169 tons; South African, 11,114 tons; Newcastle, 6,082 tons; Dundee, 5,813 tons; Natal Steam, 5,718 tons; Ramsay, 5,464 tons; Hatting Spruit, 5,166 tons; Ballengeich, 4,833 tons; Dewar's Anthracite, 424 tons; Star, 244 tons; Vaalbank, 9 tons; Makatees Kop, 7 tons; total, 220,952 tons; corresponding month, 1911, 208,228 tons. Coal bunkered and exported at Durban: Bunker coal, 98,061 tons; coal exported, 47,759 tons; total, 145,820 tons.

E. J. MOYNIHAN,
CONSULTING ENGINEER.
PLANS, SPECIFICATIONS, REPORTS AND ADVICE, MINING EQUIPMENT, STRUCTURAL WORK AND FINANCIAL ADVICE.
10, ANGLO-AUSTRIAN BUILDINGS. Box 2061.
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PROGRESS AT SPRINGS MINES.

Reef to be Intersected at End of Year.

During 1911 the shafts of the Springs Mines were sunk a further 1,644 feet, of which 989 feet were accomplished in the North Shaft and 655 feet in the South Shaft. Anticipations in regard to increased footage and reduced costs were unfortunately not realised, as, owing to the large quantity of water still being encountered, it was found necessary to excavate pump stations and large sumps below the dolomite formation in both shafts. This naturally retarded sinking operations, and, as a consequence, normal conditions were not realised in the North Shaft until November last, and have still to be reached in the South Shaft. Conditions in both shafts are now, however, such that, provided no unforeseen difficulties arise, the reef should be intersected in the North Shaft towards the end of the year, and in the South Shaft during the early part of 1913. The total depth of the North Shaft at the 31st December was 1,572 feet, costing £57 10s. 4d. per foot, and of the South Shaft 1,301 feet, costing £65 18s. 4d. per foot, giving an average cost of £61 6s. 5d. per foot. Costs of sinking in December were as follows:—North Shaft, 159 feet sunk at £30 4s. per foot; South Shaft, 105 feet sunk at £39 19s. 7d. per foot. During the year the Directors entered into an agreement with the Rand Water Board to sell to the Board all surplus water from the shafts, which formerly ran to waste, at the price of 3d. per 1,000 gallons. Pumping commenced on the 15th December, and from that date to the end of the year 13,450,000 gallons passed through the Rand Water Board's meter, and the Company's finances benefited thereby to the extent of £168 2s. 6d. The cash receipts and the expenditure to the end of the financial year were as follows:—Receipts: Working capital, 330,000 shares at 30s., £495,000; interest and sundry revenue, £33,269 3s. 3d.; total, £528,269 3s. 3d. Expenditure: Transfer duty, etc., £9,776 6s. 8d.: shaft sinking and equipment, £297,625 11s.; general expenses, £22,090 10s. 6d.; balance, being cash and cash assets, after deducting liabilities, £198,776 15s. 1d.

Consulting Engineer's Report.

Mr. W. J. Honnold, the Consulting Engineer, writes:—The work of excavating the pump chambers and the large sumps called for by the exceptional quantity of water to be dealt with, coupled with some delay in the delivery of pumps, consumed more time than anticipated. Consequently, normal sinking conditions were not reached in the north shaft until November, and have still to be realised in the south shaft, the latter being somewhat handicapped by labour shortage which, however, it is hoped will soon be corrected. I am pleased to be able to report that sinking conditions below the dolomite are as favourable as could be expected. Practically no additional water has been encountered, and that associated with the dolomite has been effectually intercepted at the pumping stations. Based on the bore-holes, after correction by survey, it would seem, as previously reported, that at the north shaft the reef lies at a depth of about 3,150 feet, whereas in the south shaft it should be cut at about 3,275 feet. With good luck, therefore, it may be possible to start development from the former by the end of the year.

THE POSITION OF THE GLENCAIRN.

Life of the Mine—Improved Results—Ore Reserves Revalued.

The revenue at the Glencairn for 1911 was: From gold, £181,193 9s. 10d.; from other sources, £1,550 11s. 8d.; balance from last year, £20 14s. 11d.; total, £182,764 16s. 5d. Expenditure: Working costs and general expenditure, £153,708 6s. 7d.; dividend No. 14 of 5 per cent., £27,500; donations, £200; contribution, Miners' Phthisis Sanatorium, £158 18s. 6d.: Miners' Phthisis Allowances Act, 1911—amount claimed and paid under the Act, £145 9s. 7d.; profits tax, £2,042 18s.; leaving a debit balance to next account of £990 16s. 3d.

Consulting Engineer's Report.

Mr. J. G. Lawn, the Consulting Engineer, writes:—For the first few months of 1911 the returns from the Glencairn Mine were not very encouraging, but as the year advanced the position improved, and during the last quarter the profits were higher than at any other period of the year. The ore milled was of very low grade, the average recovery value being 14.746 shillings per ton, as compared with 15.088 shillings for the previous year. However, there was a further slight reduction in working costs of .310 shilling per ton. The tonnage crushed was less by 21,533 tons, but fortunately we were able to treat a much larger quantity of accumulated slime, the profit from this source amounting to £9,369, as compared with £6,072 for 1910. The working profit totalled £27,185, being an increase on the previous year of £1,185. A certain amount of development work was carried on in the older workings, but no credit was taken in the reserves for the ore exposed, owing to the uncertainty as to the quantity remaining. Practically the only development work remaining to be done is in the Knights tribute section of the mine. The results so far obtained in this section have not been very encouraging, but it may still prove to contain a considerable tonnage of payable ore. The ore reserves were carefully recalculated at the end of the year. Our experience during 1911 went to show that several of the blocks of "doubtful" reef, which it had been hoped would repay the cost of mining, were of lower grade than was anticipated, and they have, therefore, had to be finally written off as unpayable. Other portions, which come within the pay limit, are of lower value than was previously estimated. Taking these factors into consideration, it is calculated that the ore reserves at 31st December, 1911, stood at 925,000 milling tons, of an average estimated recovery value of 3.5 dwts. The ore exposed in the Knights tribute section has not been included in the above total, although it is hoped that a certain percentage of this ground will be available for the mill. The slimes plant has increased during the year, so that it is hoped that it will now be possible to treat some 3,500 tons of accumulated slime per month. There are 350,000 tons of accumulated slime of an average value of 1.9 dwts. on the property. There is also still a small tonnage of richer slime on the old Glencairn section, but this has largely been exhausted. On the whole, although no great improvement can be expected, it is hoped that the mine will achieve results during the present year at least equal to those of the past year.

Manager's Annual Report.

The Manager writes, *inter alia*:—A good deal of exploratory work has been done during the period under review, both by means of ordinary development and by drilling. At the 200 feet station, Glenluce, a borehole was put down through the big dyke to determine the extension in depth of the reef in the Knights tribute section. The Bastard was encountered at a depth of 120 feet vertical, assaying 2.9 dwts. over 137 inches, of which 57 inches assayed 3.9 dwts., and indicating 600 feet backs to surface at that point. The leader and South Reef were poorly developed, assaying together with parting .8 dwt. over 49 inches. This section is now being further explored by means of a drive from the Witwatersrand Mine, 31½ feet having been driven to date over our boundary at a vertical depth of 240 feet, the last sampling gives a value of 44.4 dwts. over 16 inches. A borehole, put up near the end of the 830 feet level east, Glenluce, to test the reefs overhead, gave Bastard 60 inches 1.9 dwts., and Leader 22 ins. 13.2 dwts., but no South Reef. Boreholes put up in the hanging of stopes 12. 1 east and 12. 2 east gave similar results as regards Bastard, but unpayable values for Leader and South Reef. In the overlap area at the 760 feet level, Glencairn, a body of South Reef between faults was located by a borehole, assays giving 16.1 dwts. over 42 inches. From 11. 1 west stope, Glencairn, a cross-cut was driven north to locate an inferred area of reef between two dykes. It encountered the South Reef, assaying 6.8 dwts. over 20 inches, and is still being continued to intersect the other reefs. An average number of 24.19 large rock drills were in use during the year. The ore stoped by them was 83,860 tons. An average of 2.84 large rock drills were in use during the year. The footage driven, risen and sunk, etc., by them was 1,316½ feet. The additional plant for treatment of slime accumulations was completed during the year, which will allow for the treatment of a larger quantity of slime.

THE NEW RIETFONTEIN TO-DAY.

Year's Results Show a Considerable Improvement—Decreased Tonnage Crushed—Increased Profits and Reduced Costs.

The revenue of the New Rietfontein during 1911 was: From gold, £233,646 18s. 9d.; from other sources, £5,537 5s. 5d.; total, £239,184 4s. 2d.; balance from last account, £4,224 14s. 3d.; total, £243,408 18s. 5d. Expenditure: Working costs and general expenses, £194,297 14s. 3d.; dividend No. 11, £30,504 4s.; donations, £50; contributions to Miners' Phthisis Sanatorium, £265 4s. 4d.; Miners' Phthisis Allowances Act, 1911—amount claimed and paid under the Act, £292 14s. 5d.; profits tax, £1,529 12s.; depreciation as per balance sheet, £8,438 6s. 4d.; total, £235,377 15s. 4d.; credit balance to next account, £8,031 3s. 1d.

Consulting Engineer's Report.

The Consulting Engineer, Mr. J. G. Lawn, writes:—It is satisfactory to report that the results of the year's work show a considerable improvement on those for 1910. Ore of lower grade was milled during the year, but the reduction in working costs, which was brought about in the closing months of 1910, was maintained, and the total gross profit was increased from £20,538 to £44,886. Unfortunately, it was not possible to mine sufficient rock to keep the mill running full time, and the tonnage crushed shows a decrease of 9,630 tons. This was entirely due to a shortage of native labour, from which the mine suffered during the first six months of the year. Development operations were confined almost entirely to the central section of the mine, and a considerable area of payable reef was exposed between the 10th and 13th levels, from the No. 2 incline shaft. The longitudinal dyke which was encountered in the eastern section of the property was picked up in the 13th level east drive from this shaft, and a borehole was put down at this point with a view to testing the thickness of the dyke. The hole was stopped at a depth of 756 feet, no information of a conclusive nature having been obtained. Towards the end of the year, the labour shortage was relieved to a certain extent, and the sinking of No. 1 shaft at the western end of the mine was resumed, as well as driving the cross-cut from the 12th level. A downthrow fault, which was encountered at the 8th level, causes a displacement of the reef of some 280 feet in extent. The cross-cut referred to above was driven with the object of picking up the reef below the downthrow, and this was accomplished just at the end of the year. This is a section of the mine of which very little is known so far, and active development operations will be undertaken in it during the current year with a view to ascertaining its value and making it available for stoping. It was thought that it would be wise to deepen the borehole, which was started in the early part of the year 1910, south of the big dyke, as it was felt that it had not been drilled sufficiently deep to exhaust the possibility of the reef being found in its neighbourhood. At the end of the year the borehole had attained an inclined depth of 2,950 feet, and as it was still in Witwatersrand formation it was continued. The payable ore reserves at the 31st December, 1911, stood at 361,484 tons, of an estimated recovery value of 6.1 dwts. It will be seen from the Manager's report that the payable ore developed amounted to 111,744 tons, but in addition to this 88,783 tons were won from blocks of ground which had not been included in the payable ore reserves. The reserves show an increase of 19,705 tons for the year. The current year opens with a better labour supply than was available during the past year, and if this is maintained there is a reasonable prospect of improved returns.

Manager's Annual Report.

The Manager writes, *inter alia*:—Shafts.—Owing to the acute scarcity of native labour no work was done in No. 1 shaft until late in the year, when the shaft was unwatered and 9 feet of sinking done. No sinking was carried out in any of the other main shafts, all of which were maintained in good working order. Development.—The total footage driven, risen and sunk during the period was 5,962 feet, which consisted of 2,566 feet of driving, 2,311 feet of rising and sinking winzes, and 1,085 feet of crosscutting. On a milling basis the ore developed by this footage was 111,744 tons. Mining.—The ore stoped during the period amounts to 217,725 tons, and the ore from development amounts to 12,468 tons, making a total of 230,193 tons sent to the crushing and sorting station. Ore Treatment.—Of the 230.193 tons sent to the crushing and sorting station 49,289 tons, equal to 21.4 per cent., were sorted out as waste. Milling.—The full mill of 120 stamps ran throughout the period. The net running time amounted to 314.96 days, and the tonnage crushed was 180,822 tons of an average value of 6.567 dwts.; the duty per stamp per day was 4.78 tons. The amalgam recovered amounted to 110,644 ounces, giving 38,848.172 ounces of fine gold, valued at £165,267 10s. 2d.; the recovery in fine gold per ton treated was 4.297 dwts. The percentage of total gold in ore recovered in the mill was 65.43. Cyaniding Sand.—The sand treated amounted to 124.208 tons, equal to 68.69 per cent. of the tonnage milled. The average value of the sand charges was 2.609 dwts., and of the residues .602 dwt., and the extraction per ton treated was 2.007 dwts. The working profit amounted to £39,349 4s. 6d., equivalent to 4.353 shillings per ton milled. Sundry revenue amounted to £5,537 5s. 5d., making a total gross profit of £44,886 9s. 11d. New Work.—A location of forty huts was erected during the year for housing married natives. At No. 2 shaft a change house was erected for tropical natives. At No. 4 shaft a Sirocco fan was erected for the purpose of ventilating the No. 2 incline section of the mine, and the working conditions have been greatly improved. General.—The development in No. 2 incline has opened up a considerable quantity of ore of good value. The work of re-opening the upper levels in Nos. 1, 5 and 7 shafts has resulted in a large quantity of payable ore being found in these sections. Work has been restarted in No. 3 shaft with a view to taking out pillars and prospecting blocks of ground left unworked. Owing to the scarcity of native labour it was necessary to do a considerable amount of machine stoping during the year, the narrowness of the reef and the extremely faulted nature of the ground cause machine stoping to be very undesirable; the native labour force has now been considerably increased, but the class of new labour obtained is very inefficient, and has caused an increase in working costs during the latter months of the year. The percentage of sorting has dropped on account of increased reef width in a number of stopes, and also as it has been found inadvisable to push the sorting owing to the difficulty of preventing the thin carbon leader being thrown out with the waste. The reef series was struck at the end of the year in the cross-cut north at the 12th level No. 1 shaft; the reef has been faulted down about 280 feet from the 8th level. The whole of the surface plant ran well, and was kept in good repair during the period.

Rand Mines and French Directors.

The Rand Mines, Ltd., Crown Mines, Robinson and Village Deep companies have notified their shareholders that it is considered desirable that a director representative of French shareholders should be appointed to each of these companies. Special general meetings have, therefore, been convened at which the shareholders are asked to authorise the increase of the directorate, in the case of Rand Mines and Robinson from seven seats to eight seats each, Village Deep from eight seats to nine seats, and Crown Mines from nine seats to ten seats.

Giant Mines.

The secretary of the Giant Mines, Ltd., has issued a circular stating that, owing to the prolonged illness of Dr. Corstorphine, he has been unable to again inspect the property until a week ago. He has, however, made a thorough examination, and he says that the exploratory work to locate the lost lode has by no means exhausted the possibilities, and boring is to be continued. Mr. Gordon Dickson, the consulting engineer, has cabled that he has interviewed Dr. Corstorphine, and he adds he shares his opinion as to ultimate success. It would be an excellent thing for the Rhodesian market in general, and for shareholders in the Giant in particular, if the lode is found, and we are glad to note that no effort is to be spared to achieve success.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted for the consideration of the Editor that is not accepted by him will be returned if a stamped and directed envelope is enclosed for the purpose.

THE LATEST FROM ZAAIPLAATS.

Mine Manager's Report—Question of Ore Reserves—New Payable Section Proved.

Mr. Furner, the mine manager of the Zaaiplaats Tin Mining Company, Ltd., reports that the estimated total tonnage exposed in the various working sections of the property is 30,500 tons of ore, of an average value per ton of 4·52 per cent. tin, equal to 1,378 tons of metal. In addition to this, there are several branch pipes which are not included in the above tonnage, and it is impossible to furnish reliable data as to the tonnage available from them, but they can be relied upon to furnish a large quantity of ore of good average grade. Along the hillside below the group of pipes Nos. 1, 2, 3, 4, 5, 6, and 6a, there is a considerable quantity of very high grade alluvial, and which also contains the broken down portion of the outcrop of these rich pipes, which may run into several thousand tons, and which will give a very handsome return on treatment. The alluvial deposit in the valley below the mill, which is of very large extent, has not been worked on. It is a very valuable asset. Of the rich stored slimes and also the tailings, which will return a good profit on re-treatment, there are approximately 60,000 tons. An extension to the slimes plant for the proper handling of these has now been taken in hand.

Mr. Furner also points out that when he last submitted a report on the ore reserves at July 31, 1910, they were given at approximately 30,000 tons, and a forecast was then made that the reserves would be largely increased during the ensuing year. "We are now milling about double the quantity of ore, and when it is taken into consideration that owing to the peculiar nature of the ore deposits on which it is impossible at times to push the development as fast as one would desire, it is satisfactory to note that the ore reserves have not been reduced. The mill ran (March) 29·25 days; ore crushed, 2,800 tons; duty per stamp per 24 hours, 6·381 tons; average yield concentrates, 5 per cent.; concentrates won, 140 tons; estimated average value concentrates, 68·5 per cent. tin; estimated working costs (including mining, milling, tramming, concentrating and drying of concentrates, but not including realisation costs), £3,050; total development risen, driven and sunk, 364 feet; ore mined, 3,100 tons.

"Development headings are showing up average grade ore, the main feature of the month's work being the proving of a new payable section underlying the pegmatite, close to the camp. It has been sunk on to a depth of 105 feet, and exposed on the bottom, over a width of 18 feet, with payable ore still going in on each side, and is dipping at 35 degrees. The thickness is 48 inches. Two rock-drills have been put in to facilitate sinking. I consider this new development very important, as it may be found to be payable over a large area. Native labour continues plentiful. There are now 800 in the compound. We have had beneficial rains lately on the Sterk River watershed, and the supply of water for milling is assured for some considerable time. The directors estimate the approximate profit for the month at £9,500. This does not allow for the Government profits tax."

THE NEW UNIFIED IN 1911.

Improved Profits and Recovery—Satisfactory Development—Reduced Costs.

The revenue of the New Unified in 1911 was as follows: From gold, £185,514 2s. 8d.; from other sources, £1,155 12s. 3d.; total, £186,669 14s. 11d.; balance from last account, £6,934 19s. 4d.; total, £193,604 14s. 3d. Expenditure: Working costs and general expenses, £133,526 5s. 9d.; dividends, £37,500; donations, £100; contribution, Miners' Phthisis Sanatorium, £122 6s. 3d.; Miners' Phthisis Allowances Act, 1911—amount claimed and paid under the Act, £132 8s. 3d.; profits tax, £3,534 18s.; depreciation as per balance sheet, £7,113 11s. 11d.; total, £182,029 10s. 2d.; balance to next account, £11,575 4s. 1d.

Consulting Engineer's Annual Report.

Mr. J. G. Lawn, the Consulting Engineer, writes:—It will be seen from the Manager's report that there has been a considerable improvement in the results obtained during the past year. Working costs were reduced by one shilling per ton of ore milled, the value of the gold recovered was increased by two shillings per ton, and the total gross profits at £53,143, were higher than the 1910 profits by £19,240. The grade of the ore milled showed an improvement of .438 dwt. This accounted to a large extent for the increased recovery, but the latter also benefited by the addition of a tube mill to the reduction plant. The tube mill was started up during September, and the running of this plant effected a considerable reduction in the value of the sand residues during the period it has been in operation. The treatment of the slimes accumulations was carried on throughout the year, and the profit from this source amounted to £4,949. The main incline shaft has reached an inclined depth of 2,521 feet, and its now within 100 feet of the southern boundary of the mine. It is anticipated that shaft sinking will be completed in 1912. The development of the mine continued to expose ore of very satisfactory value. The opening up of the lower levels has shown that the Main Reef Leader continues to improve in depth. The bulk of the driving was carried on at the 12th and 13th levels. The 13th drive is the bottom level of the mine so far as the ground east of the shaft is concerned, but two more levels still remain to be driven to the west of the shaft, viz., the 14th and 15th. The driving of the 14th level was commenced shortly before the end of the year. Development on the South Reef shows it to be patchy, but, though of lower average grade than the Main Reef Leader, it will yield a considerable tonnage for the mill. The Main Reef is mostly below pay limit, though here and there patches can be worked to advantage. The payable ore reserves at the end of the year amounted to 288,343 tons of an estimated recovery value of 6.73 dwts. No Main Reef is included in these figures. The supply of native labour has been somewhat restricted during the year, and it was necessary to resort to the use of rock drill machines in several of the stopes in order to keep the mill running. Mr. F. B. Lewis resigned his appointment as manager in September, and Mr. J. E. Healey has been appointed to that position.

Manager's Annual Report.

The Manager writes, *inter alia*:—The total extraction amounted to 6.87 dwts. per ton of ore milled. Costs and Profits.—Mining. £59,661 3s. 1d. (9.753s. per ton); developing, £17,582 10s. 1d. (2.874s. per ton); hoisting, £4,848 9s. 8d. (.793s. per ton); pumping, £3,873 1s. 4d. (.633s. per ton); transport of ore, £633 1s. 6d. (.103s. per ton); sorting, £3,104 12s. 5d. (.508s. per ton); crushing, £1,433 7s. (.234s. per ton); milling, £10,543 0s. 11d. (1.724s. per ton); tube milling, £929 14s. 4d. (.152s. per ton); cyaniding sands, £8,247 8s. 7d. (1.348s. per ton); cyaniding slime, £3,073 12s. 9d. (.502s. per ton); general expenses—mine, £6,266 10s. 4d. (1.024s. per ton); general expenses—head office, £11,193 17s. 8d. (1.830s. per ton); total working costs, £131,390 9s. 8d. (21.478s. per ton); working profit, £47,039 3s. 7d. (7.690s. per ton); revenue from gold, £178,429 13s. 3d. (29.168s. per ton). The gross profits for the year were as follows:—Working profit as above, £47,039 3s. 7d.; profit from treatment of accumulated slime, £4,948 13s. 4d.; sundry revenue, £1,155 12s. 3d.; total, £53,143 9s. 2d. A new Belliss and Morcom 15-drill compressor was erected during the year, and at present is supplying the full requirements of air. The old 20-drill compressor is being thoroughly overhauled, and new foundations put in. A tube mill, with the necessary adjuncts, has been erected and is running.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' Examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 16, Anglo-Austrian Buildings, Box 2061, Johannesburg.

THE OUTLOOK FOR THE VAN RYN DEEP.

Over 600,000 Tons Averaging 7·17 dwts. Developed—Plans for Reduction Works in Preparation.

In their annual report for 1911, the directors of the Van Ryn Deep note with gratification that, notwithstanding the difficulties encountered, over 600,000 tons of ore of an average value of 7·17 dwts. are now developed in the mine. Instructions have been given to prepare the necessary plans for the reduction works, and it is anticipated that by the time the plant is erected development will be sufficiently advanced to keep the mill fully supplied.

Consulting Engineer's Annual Report.

Mr. J. G. Lawn, the Consulting Engineer, writes :—During the past year the greater part of the development was accomplished from the west shaft. Here driving was carried on at the first, second, and third and fourth levels, and also at an intermediate level east of the west shaft between the second and third levels. The first level west was mostly low grade, though a section of it gave fair values; but nearer the shaft, and at lower levels, some areas of high grade ore have been encountered, which make the average value of the ore reserves very satisfactory. As is usual in the neighbourhood, the ground is patchy in value, but, so far as development has gone, it may reasonably be considered that the Van Ryn Deep has had its share of the rich patches. Early in the year a downthrow was encountered in the east shaft, which subsequently proved to amount to no less than 400 feet. Owing to the small angle of dip of the reef, this proved a serious hindrance to development in this section of the mine. The incline shaft had to be steepened in order to reach the reef within a reasonable distance. However, the reef was recovered towards the end of the year, and it is hoped that development will now proceed at a rapid rate from the east shaft. The downthrow cuts across the property in a south-westerly direction, and will probably be encountered in the west shaft between the fifth and sixth levels. At the end of the year there were developed 603,716 tons of a value of 7.17 dwts. On the whole, and in spite of hindrances, the development of the mine has shown many encouraging features, and now that funds have been provided, it will be pushed on as rapidly as possible, so that, by the time the crushing stage is reached there is every reason to hope that there will be an adequate ore reserve of satisfactory grade. The design of the surface equipment is now in hand, and it is hoped that erection will commence about May of the current year. A year after erection has commenced the mill and cyanide plant should be ready for handling ore.

Manager's Annual Report.

The Manager writes :—The east incline shaft was continued as a five-compartment shaft to a depth of 1,180 feet from the main station, or a distance of 625 feet. In this distance the shaft passed through two big dykes, one causing a downthrow of the reef to the extent of about 400 feet, and the second an upthrow of about 100 feet. The position of the reef having been located by a borehole, showing a value of 25.8 dwts. over 19.5 inches of core, the shaft was continued as a three-compartment shaft at angle of 42 degrees to a depth of 1,600 feet or a distance of 420 feet, at which point the reef was intersected and levels were started east and west. The shaft was continued on reef to a depth of 1,958 feet, making the total distance sunk during the year 1,403 feet. The reef series was exposed over 280 feet, and the values obtained over this distance for reef plus partings were 8.48 dwts. over 29.2 inches A bin was cut and timbered at the 1,600 feet level. The bottom of the shaft is now 358 feet below the last level, and sinking is proceeding. The cost of sinking the 1,403 feet was as follows :—Sinking, £14,028 13s. 4d., equal to £10 per foot; timbering, £2,546 2s., equal to £1 16s. 3d. per foot; installing rails and ladderways, £1.571 5s. 8d., equal to £1 2s. 5d. per foot; pumping and baling, £1,296 11s. 8d., equal to 18s. 6d. per foot; total costs, £19,442 12s. 8d., equal to £13 17s. 2d. per foot. The sinking of the west incline shaft was continued till the end of March, when it had reached a depth of 1,703 feet from the main station, and in December the shaft was sunk a further 13 feet to a total depth of 1,716 feet, or a distance of 530 feet for the year. The upper portion of the shaft, which was sunk originally for three compartments for a distance of about 350 feet, was stripped to the width of the lower portion of five compartments. A 10 inch air column was installed in the shaft down to the 4th level. The main station near the top of the incline was timbered, and the cutting of the main hoisting station was nearly completed. The main bin, to hold 600 tons, which is to connect the incline shaft with the vertical shaft, was holed, and is now being stripped for the required capacity. The cost of sinking the 530 feet, together with the cost of stripping and timbering the upper portion of the shaft and installing air main, was as follows :—Sinking, £5,997 18s. 9d., equal to £11 6s. 4d. per foot; timbering, £1,293, equal to £2 8s. 9d. per foot; installing rails and ladderways and 10in. air column, £1,540 8s. 5d., equal to £2 18s. 2d. per foot; pumping and baling, £399 0s. 1d., equal to 15s. 1d. per foot; total costs, £9,230 7s. 3d., equal to £17 8s. 4d. per foot. The amount of development work done and the reef exposures obtained will be seen from the table attached. At the west shaft a remarkably rich body of reef was encountered at the 3a level, and the 4th level has also opened up some good ground. The 4th level No. 1 winze west, which is the lowest point in this section, has exposed reef of good value. During the year 111,050,000 gallons of water were pumped and hoisted from the mine. The Glenfield and Kennedy three-throw electrically-driven pump, capacity 10,000 gallons per hour, with motor, transformers, etc., was transferred from the east vertical shaft and installed at the 4th level of the west incline shaft, and a 6in. delivery column, which was also removed from the east vertical shaft, has been laid to the main pump station at the 1st level. The erection of the steel headgears at the east and west shafts has been completed as far as possible without interference with the present temporary arrangements. A planing machine has been added to the workshops plant, and the buildings and machinery have been maintained in good order.

PROGRESS AT THE GOVERNMENT GOLD MINING AREAS.

"Decent Progress in all Four Shafts"—Reef to be Struck Before Middle of Year.

Consulting Engineer's Report.

Mr. J. G. Lawn, consulting engineer on the Government Gold Mining Areas, in his annual report, writes :—Early in the year the supply of native labour was very inadequate, so that, though an attempt was made to sink three out of the four shafts, only one of them, the north-west, had anything like an adequate complement. Later, however, the position in this respect improved, and May saw three of the shafts going at a fair speed. Later, labour came in more plentifully, and the end of the year saw decent progress being made in all four shafts. Although all the shafts have a little water, yet it has not been enough in either one of them to seriously interfere with the speed of sinking. So far, the average rate of sinking has been as good as was estimated, and there seems little doubt but that one or both of the northern shafts will reach the reef before the middle of this year. It will be seen from the table attached to the manager's report that the shafts are being sunk at a moderate cost. Two air compressors have been erected. It is hoped that it will not be necessary to run them on account of striking water in either one of the shafts, but they will be available for development as soon as the reef is reached. The railway sidings to the various shafts are now in course of construction. Portions of the permanent workshops and of the permanent stores building have been erected near the south-east shaft. Unfortunately, it was decided by the Minister of Mines that the present Gold Law did not permit of the planting of trees on proclaimed ground, so that the scheme for plantations is in abeyance. The advantages, however, of plantations to those who live on the mines is so obvious that it is hoped the law will soon be set right in this respect. Mr. T. C. Bruce resigned his appointment as manager at the end of March, and Mr. M. H. Coombe was appointed to that position.

Manager's Annual Report.

The manager writes :—I beg to submit herewith report for the year ended December 31st, 1911. The accompanying tabular statement shows the monthly depths sunk in the four shafts, together with the cost of sinking :—North-east shaft : This shaft was sunk 1,363 feet during the year, and attained a depth of 1,420 feet. Dolomite continued to a depth of 245 feet, when Witwatersrand quartzite was entered. The Kimberley slates were encountered at 595 feet, and were passed through at 966 feet. At 1,081 feet the shaft entered a hard and close-grained dyke, which proved to be 135 feet thick. Then at 1,286 feet a horizontal amygdaloidal diabase dyke, well-known in the neighbourhood, was met with. The shaft was still in this dyke at the end of the year. The quantity of water pumped and baled from the shaft averages 6,972,250 gallons per month. North-west shaft : This shaft was sunk 1,493 feet during the year, and attained a depth of 1,609 feet. Good progress was made through the Kimberley series, but at 572 feet a very hard dyke was intersected, in which sinking was slow. At 673 feet the shaft passed into the Kimberley slates, which continued to a depth of 1,070 feet, when quartzite was encountered. At 1,410 feet the amygdaloidal diabase was met with. This is a hard, tough rock, and the rate of sinking was much reduced. It was passed through at 1.509 feet, since when the shaft has been in quartzite, with occasional beds of reef. The quantity of water pumped and baled from the shaft averages 2,225,500 gallons per month. South-east shaft: This shaft was sunk 1,294 feet during the year, and attained a depth of 1,388 feet. At the end of last year the shaft was in dyke; dolomite was entered at 137 feet, but it only proved to be 19 feet thick. At a depth of 156 feet the quartzite of the Witwatersrand series was encountered, and from there the shaft has been in quartzite, with numerous reefs belonging to the Kimberley series. The average sinking in this shaft since labour became more plentiful has been excellent. The quantity of water pumped and baled from the shaft averages 3,187,500 gallons per month. South-west shaft: No sinking was done in this shaft for the first four months of the year, as no labour was available for it. In May a start was made as it looked as if labour would be more plentiful, but it had to be closed down again, and it was only in August that sinking could be definitely commenced, and even then the number of boys available was small. It was sunk 414 feet during the year and attained a depth of 447 feet. The dolomite was left behind at 140 feet, and quartzite with occasional bands of reef was entered. The quantity of water pumped and baled from the shaft averages 644,500 gallons per month.

Machinery and Plant.—During the year the permanent steel headgear at each shaft, together with the temporary bins for use during sinking and development, have been completed, and the direct-acting hoist at each shaft has been put into commission. A 50-drill steam driven compressor has been erected at the north-west shaft, and the erection of a similar size machine at the south-east shaft is nearing completion. Air receivers are being installed at all four shafts, and an air main has been laid on the surface between the north-west and north-east and the south-east and south-west shafts. The boiler plants at the north-west and south-east shafts have each been augmented by the addition of two further Babcock & Wilcox boilers, while one additional boiler of the same type has been added to the plant at the north-east shaft. The erection and equipment of the portion of the permanent workshops near the south-east shaft have been completed, and the central store and store yard has been erected in the same locality. The transformer houses near the south-east and north-west shafts, with the necessary equipment and the power transmission and lighting lines over the property, have been completed, all buildings being now lit throughout from this source. A system of telephones between the shafts, office, manager's house, etc., has been installed. Steel coal bunkers are being installed at each shaft, and considerable progress has been made with the system of railway sidings to the shafts, store, etc. Quarters for white employees now consist of 44 semi-detached cottages, two staff cottages and fourteen blocks of single rooms, each block containing four rooms. Of these, sixteen semi-detached cottages, staff cottage, and seven blocks of single rooms are situated between the northern shafts, and the same number between the southern shafts, while six semi-detached houses are situated on the site of the village. In addition to the above, four semi-detached cottages are now being built at the northern shafts and eight in the village, while a Secretary's house is also in course of erection. The section of the northern compound has been completed; bathrooms to serve the single quarters have been built, and the southern boarding house has also been completed. A change house for white men and a drying room for natives have been erected at each shaft. A hospital for natives has been completed near to the southern compound, and two native locations are in course of erection.

MESSINA (TRANSVAAL) DEVELOPMENT PROGRESS.

Points from the Quarterly Report—Ore Reserves—Details of Position.

Mr. J. M. Calderwood, consulting engineer to the Messina (Transvaal) Development Company, in his report for the December quarter, puts the ore milled at 2,128 tons, concentrates produced at 256.65 tons, assay copper 50.5 per cent., middlings produced 205 tons, assay copper 14.8 per cent.; total recovery 461.65 tons, assay copper 34.5 per cent., amount copper 159.59 tons. The concentrates account shows 21.83 tons on hand October 1, 1911, 256.65 tons produced during the quarter, total 278.48 tons, despatched from mine 188.4 tons, at mine on January 1, 1912, 90.00 tons. Ore treated included 130 tons from the middle lode, 1,762 tons from the north lode, and 236 tons from the Bonanza lode; total, 2,128 tons. The development footage totalled 1,246 feet, of which 373 feet was on lode, average assay value 11 per cent. copper over an average width of 60 inches. The total running time of the mill was 36.3 days, 2,128 tons were treated, equal to 58.1 tons per day. The mill was run during the day only, treating ore entirely from development work in progress during the quarter. The usual shortage of native labour at the season curtailed development work, the footage for the quarter amounting to 1,246 feet, as compared with 1,679 feet for previous quarter. The chief development was confined to north lode at No. 4 shaft, at which point all hoisting operations have now been centralised. On the second level a stoping drive was put in from No. 4 E. winze, 40 feet above the second level, exposing very good values for a distance of 55 feet, average assay 24 per cent. copper over 60 inches. The mineral is chiefly copper glance, the highest individual assay giving 49.4 per cent. copper over 60 inches. On the third level a short cross-cut north from the east drive, near No. 7 shaft, exposed a good ore body on a parallel fissure, assaying 18.5 per cent. copper over 60 inches for 14 feet driven. On the fourth level the drive east, foot wall section connected with No. 2 E. winze in ore, assaying 33.4 per cent. copper over 24 inches, and 4.0 per cent. copper over 42 inches. Winze No. 3 W., below the fourth level, was sunk in ore, average assaying 16.0 per cent. copper from 35 feet to 40 feet down to 3 per cent. copper from 45 feet down, over an average width of 60 inches. Winze No. 3 W., below the fourth level, was sunk in ore, assay 10 per cent. copper for a vertical distance of 80 feet, values being continuous. On the sixth level the drive east from No. 4 shaft was put in 170 feet. At 100 feet in, lode was struck assaying 36 per cent. copper over 78 inches exposed on north side of drive, which proved to be the western end of the Bonanza ore shoot. The drive was kept on hanging wall section, and at 150 feet assayed 13.2 per cent. copper over 60 inches, the average assay value from this point to 170 feet was 14.8 per cent. copper over 60 inches. The development in this section exposed massive bornite and pyrites such as found in the Bonanza at fourth and eighth levels, and there can be no doubt that the ore body exposed on sixth level clearly proves the continuation of the Bonanza with its heavy mineralisation and high values from fourth to eighth levels as anticipated. On the eighth level the development continues to be satisfactory. The lode has now been exposed for a length of 180 feet, of which 92 feet were driven during the quarter. For 120 feet the values were: Bonanza section, 120 feet; assay copper 18.0 per cent. over 60 inches. At 40 feet east from shaft a cross-cut was put in, 29 feet north, passing through a solid vein of glance 9 inches thick, assaying 50.8 per cent. copper. From 52 feet to 70 feet east, values were patchy, average assay about 3 per cent. copper over 60 inches. In the west drive glance ore occurs beyond the zone of bornite and chalcopyrite, which forms the enrichment known as the Bonanza. From 48 feet to 90 feet west, the average assay is 5.5 per cent. copper over 60 inches, the glance in places assaying up to 41.5 per cent. copper over 12 inches. On the middle lode, at the third level, drive east from No. 4 shaft was advanced 26 feet, assaying 4 per cent. copper over 60 inches. Winze No. 3 W., from third level, has been sunk 54 feet, assaying from 2.7 per cent. to 4.6 per cent copper. Rise from main cross-cut on third level (No. 3 shaft) was put up 8 feet, assaying 3.7 per cent copper. On fourth level, development at No. 4 shaft on the line of lode east and west, has so far exposed poor values.

Ore reserves.—Ore developed to 4th level, 87,000 tons; ore partially developed from 4th to 8th levels, 40,000 tons; total, 127,000 tons. Less mined from June to December, 1911, 6,000 tons; total, December 31, 121,000 tons. The estimated average assay value was 10 per cent. copper. The probable ore to the 8th level was 265,000 tons. The possible ore from the 8th to 10th levels was 120,000 tons. All ore calculated as developed, is practically bounded by drives and winzes. Where ore is classed as partially developed, it has been exposed by drives but not completely blocked out by winzes. For probable ore, it has been assumed that extensions of the ore bodies will be found laterally and vertically, where exposed on one or two sides, and limited by the extent of actually proved areas. For possible ore, tonnage has been allowed for two additional levels, reasonably assumed to exist below the 8th level and as maintaining the width and value as disclosed in proved sections.

Coal.—A diamond drill was started to test the company's coal claims. No. 1 borehole was sunk to a depth of 147 feet near No. 2 shaft, passing through the coal seam originally exposed in shaft and at a depth of about 50 feet, an underlying seam of mixed coal and shale about 8 feet thick was intersected. The actual value of this seam will be ascertained by sinking No. 2 shaft when labour is available. No. 2 borehole has been started to test the claims to the south.

Railway.—Owing to the rapid increase in traffic a tri-weekly train service was started between Pietersburg and Bandolier Kop at the beginning of November. The extension of the line towards Louis Trichardt and Zand River Poort is now being pushed forward. The final survey through Zand River Poort to Messina has been completed, and construction on this section will be commenced when the rainy season is over.

Plant.—The erection of new compressor was practically completed at end of December, and work on new boiler is well in hand. By the end of January, compressor will be run continuously, and eight machine drills will be started which will greatly assist development work. Installations for air and water columns have been completed, also electric shaft signals. Steel work for compressor and boiler houses, also additional machine shop tools are on order. In connection with the scheme proposed for future operations, the first part of the electrical installation comprising one 100 k.w. 3-phase steam generator set has been ordered, and will be utilised for electric lighting at surface and underground, also for driving pumps, machine shops, etc. Later on this generator will also furnish part of the power required for increased milling operations.

TRANSVAAL COAL TRUST PROSPECTS.

A Satisfactory Year—Life of De Rietfontein Colliery—Oogies' Outlook.

The Directors of the Transvaal Coal Trust Company report that they have acquired the prospecting rights over a large part of the farm Elandspruit No. 507, in the Middelburg district, with the option to purchase the coal rights. The only other change in the property held by the company is the grant of the township at Brakpan. There is an increase of £3,924 in the amount standing to the debit of property account in the balance sheet, due to the expenditure in respect of survey and other preliminary charges in connection with the Brakpan township, together with the cost of acquiring the prospecting rights on Elandspruit. Brakpan township consists of 3,213 stands, which have been allocated as follows:—Residential, 1,772; business, 945; Government, 33; reserve, 463. The grant of the township is subject to an endowment of 10 per cent. of the stands to the Municipality of Benoni, within whose jurisdiction the ground is situated, the proceeds of the sale of which are earmarked for the purposes of road-making and other requirements of the township itself. The directors report that the Railway Administration has already well in hand the building of a new and commodious station located on the township, which should greatly enhance its value. As a condition precedent to this arrangement, the company had to undertake the cost of the removal of the Rand Collieries' siding connection from Schapenrust to the new station.

Coal Winning.

The directors again report a satisfactory year's trading. The improvement upon the results of the previous twelve months amounted to £3,216, the total profit having been £51,034, less a sum of £1,611 in respect of Government profits tax. The output from the collieries, which amounted to 497,369 tons, continued to be dealt with through the Transvaal Coal Owners' Association (1910). During the year the provisions of the Mining Taxation Act of 1910 came into force. Under the old base metal tax the amount paid to the Government for the year 1910 was £639 1s. 3d.; whilst the assessment for 1911 on the profits tax basis amounted to £1,611 13s. 7d. The output at De Rietfontein Colliery for the year amounted to 191,876 tons, showing a decrease of 13,304 tons, as compared with the results obtained during 1910. The reduction was in part due to the impossibility of maintaining the previous quality of the whole of the output, and also somewhat to the decreasing demand for coal from the Springs district. The directors appreciate that the former factor tends to materially reduce the already somewhat short life of this colliery, and, with a view to meeting the future demand for a better quality of coal, prospecting operations are now being carried on in another coal-bearing area. The output of the Oogies Colliery during the past year amounted to 305,493 tons, being an increase of 50,900 tons, as compared with the results obtained in 1910. 11,356 feet of development in the main drives were accomplished during the year, the quality of the coal having been well maintained. The sinking of a new shaft was commenced towards the end of the year, and the upper seam has already been cut, disclosing coal of promising width and quality. It is anticipated that the lower seam, which is the seam heretofore worked, will be intersected in March. All machinery is in a good state of efficiency. A new 250-h.p. Stirling boiler has been erected, this addition to the plant having become necessary to enable the increased output to be economically dealt with. During the current year it will be imperative to make further additions to the plant, so as to enable the pit to deal with an increased output should the occasion arise. This additional equipment is well in hand. Capital expenditure at De Rietfontein Colliery amounted to £889, and at Oogies Colliery to £4,412. The profit and loss (coal winning) account showed a balance of £51,031 carried to No. 2 account; whence, after taking into account sundry revenue and expenses, £42,848 was carried to appropriation account. The balance brought forward from 1910 was £7,464, which made the total to be dealt with £50,311. Dividend No. 24, of 7½ per cent., absorbed £40,932, and the profits tax £1,611, leaving £7,767 to be carried forward to the 1912 account. The balance sheet showed cash assets £61,214.

Consulting Engineer's Report.

Mr. W. L. Honnold, Consulting Engineer, reports *inter alia* as follows:—At De Rietfontein it has been found impossible to maintain the previous quality for all of the output. There has also been disappointment as to exploration and development at points heretofore regarded as promising. These facts, coupled with the further consideration that for geological reasons there is but a doubtful chance of improvement in the future, oblige us to recognise that the remaining life of this mine is now largely dependent on the continuance of a demand for a somewhat inferior average quality of coal. But even as to this, one has to recognise the possible bearing of certain questions of expediency, more particularly that as to when, for business reasons, it may become advisable to transfer the output either to Oogies or to a new colliery should one be opened. Oogies has continued to be operated on the lines followed in recent years; that is, mining, owing to the exactions of the trade, has had to be restricted to the comparatively thin section of bright coal at the base of the lower seam, which has steadily maintained its quality and thickness. With a view to meeting future requirements as to ventilation, as well as to provide against possible future demands as to hoisting capacity, a new shaft was started towards the end of the year. This has already passed through the upper seams, which shows a section of promising character that may later on be found workable. Further additions to plant, more particularly as to air-compressors, boilers, coal-cutting machines and pumping equipment, have been undertaken and will be completed in ample time to meet such requirements as may reasonably be anticipated.

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THE POSITION OF THE BENONI CONSOLIDATED GOLD MINES.

Failure of the Way-Arbuckle Process—Points from the Reports of the Consulting Engineer and Manager—An Independent Engineer's Report.

From the annual report of Mr. E. J. Way, the consulting engineer of the Benoni Consolidated, we take the following:

Ore Reserves.—You will notice that the values and tonnages of the payable and unpayable ore reserves, for the calculation of which your manager has taken as the limit of payability a mill value of 4.5 dwts., work out as follows:—Payable, mill tons, 606,839; mill width, inches, 43.12; mill value, dwts., 6.56; percentage, 62.6; unpayable, mill tons, 362,507; mill width, inches, 44.82; mill value, dwts., 3.28; percentage, 37.4. In my opinion the limit of payability for calculating the ore reserves should have been fixed at not less than 5 dwts. on a milling basis, my reasons being as follows:—(1) Until the mine has been milling on a full basis for at least six months it is extremely difficult to form any opinion of the ratio between the mine assay plan values and the actual stope tons values. It is only in this way that an accurate assay plan factor can be worked out which can then be applied in the ordinary manner. (2) The approximate average of working costs on these fields at the present time is about 20/-. Ore which will not yield more than 20/- is therefore being worked at a loss. Five dwts. ore will under ordinary circumstances give a yield of 20/-. (3) Until the assay plan factor has been arrived at accurately and until a sufficient length of time has supervened to be able to state definitely what working costs at your mine are going to be it is not, in my opinion, safe to take the margin of payability under 5 dwts., on a milling basis. Making use of this figure the ore reserves work out as follows:—Payable, mill tons, 522,671; mill width, inches, 43.31; mill value, dwts., 6.80; percentage, 54; unpayable, 446,675; mill width, inches, 41.10; mill value, dwts., 3.59; percentage, 46. You will see that the payable ore reserves, using the basis of 5 dwts., show a decrease of 84,168 mill tons, and an increase in value of from 6.56 dwts. to 6.80 dwts. Plant.—With regard to what your manager says about the plant, I am in entire agreement. It is extremely regrettable that the cyanide section thereof has not come up to expectations, although the rest of the plant leaves nothing to be desired. Certain additions to the cyanide plant will be necessary to bring it up to the capacity for which it was intended, and when these additions have been made I am of opinion that you will have a plant capable of giving you a high extraction, and one which will be mechanically efficient and on which the working costs should be satisfactory.

Manager's Report.

The manager, Mr. T. Kerr, writes, inter alia:—The preliminary running of the reduction plant has proved satisfactory, so far as the crushing and sorting station, the mill and tube mills and the waste rock conveyors are concerned. With regard to the cyanide works, it was found that the elevation of the whole of the settled slimes by means of the screws attached to the Arbuckle settling cones was not successfully accomplished, and centrifugal pumps were installed beneath each set of cones. The thickened slime is now drawn off from underside of cones and pumped direct to the treatment agitators. The same operation is performed after treatment and the residues delivered to a slimes dam. It appears, however, that under this latter method of dealing with the settling capacity of slimes the nine Arbuckle cones are insufficient for the slime product from a crushing of 20,000 tons per month. The absorption of gold which invariably takes place in a new plant accounts for the low actual extraction from 12th November to 31st December, and will affect the extraction also to a less extent in the month of January. Mining operations are now sufficiently advanced to maintain an output of 20,000 milling tons per month of the average grade of the ore reserves, provided always that a sufficiency of native labour is forthcoming.

A report by Mr. W. Laurie Hamilton, for the Jumpers Gold Mining Company, Limited, contains the following, *inter alia*:—During the last two or three months I have, according to instructions, thoroughly inspected this mine. Every facility has been given me by the officials, and all books, plans, statements, etc., that I have required, have been fully put at my disposal. It seems most unfortunate that a comparatively small and not high-grade mine should have been saddled with the expense and risk of putting up such an expensive cyanide plant on unproved lines. In definitely saying that the Way-Arbuckle plant erected on this mine has not so far proved a success, I do not intend to condemn the process, as it seems to me it could be made successful with certain modifications and additions. The Caldecott de-watering and de-solutionising tables are doing excellent work in drying the sands. But the slimes de-watering and de-solutionising cones have failed to do the work for which they were intended, and the whole slimes being produced are at present passing untreated to a dam. I would not recommend further experiments with the Arbuckle cones. As to the main body of the process, the 32 treatment agitator tanks, it was intended to re-mix the sands and slimes after de-watering, and treat them together in these agitators, but through the failure of the screw cones the treatment of the slimes has had to be temporarily abandoned. This, of course, is against the complete success of the agitators, as the presence of the slimes is a considerable help in agitating. In spite of this, so long as the treatment is continuous without unexpected stoppages, it is fairly successful in treating the sands, and the extraction is fair while nothing phenomenal. There is no proper arrangement for drawing off the contents of any individual tank, when for any reason it has to be cut out of the circuit. And in the event of any unforseen stoppage of the circuit all the agitators silt up. Take a recent instance. Some sudden failure of the transformer house cut off the power for 3½ hours. Result, the agitators were so silted-up that it took 12 hours to get them all running again, and in order to accomplish this some 120 tons of pulp (sand and solution) had to be drawn off on the floor. Another case of 2½ minutes stoppage of the compressor caused two hours stoppage. Such stoppages affect everything back to and including the mill which must hang up when they occur. An arrangement might be made, though at some expense, to obviate this silting, and the consequent delays, loss of solution, and general mess all round. Such alterations and modifications as are necessary, including the replacement of the de-watering cones by some already proved substitute, which should not cost more than a few thousand pounds, would, I think, make the plant at least fairly successful in treating both sands and slimes. Considering the many exasperating difficulties in starting an ordinary reduction plant, let alone an experimental one, I think the management by hard work and pluck has done wonders, and I see no reason why it should not pull the mine through, provided that sufficient native labour is got, that the monthly development is re-started, and that the cyanide plant is at once put into working shape.

REVIEWS.

"*Observations on the West of England Mining Region,*" being an Account of the Mineral Deposits and Economic Geology of the Region, and forming Vol. XIV. of the "Transactions of the Royal Geological Society of Cornwall," by J. H. Collins, F.G.S.

No student of the geology of the mineral deposits of the country from Ashburton to the Land's End can well afford to be without the comprehensive and excellent work upon the subject which has just been published for the author, Mr. J. H. Collins, F.G.S., by William Brendon & Son, Ltd., Plymouth. The oldest tin-field in the world has still much to teach us with regard to the many and intricate problems of economic geology, and as the area is surveyed and re-surveyed, it continues to present new problems in ore deposition which are of no small importance to a sound appreciation of the difficulties to be dealt with. The name of the author is in itself a sufficient commendation of his latest work, which comprises 392 pages of description and discussion, nearly another 300 pages of valuable appendices, and last, but not least, a useful list of the numerous works consulted.

"*Geological Solution of Fault Problems.*" By C. R. Tolman, Jun. Mining and Scientific Press and the *Mining Magazine*, London.

Following a successful series of reprints in volume form of articles which have appeared from time to time in the pages of the Mining and Scientific Press, the publishers have issued the admirable contributions of Mr. C. R. Tolman, Jun., under the title above quoted. The work is the best of the kind upon the subject that we have seen, so far, and should be invaluable not only to geological students, but to those engaged in practical mining operations.

Mr. J. L. Kuhlman has resigned the secretaryship of Messrs. A. Goerz and Co., Ltd., and has started as an accountant and auditor at Steytler's Buildings.

THE MINERS' PHTHISIS MEDICAL COMMISSION'S REPORT.—II.

Important Recommendations—Extent of the Evil—Drastic Reforms.

INCIDENCE OF THE DISEASE.

Section (c) refers to the incidence of miners' phthisis among miners at work. It says that out of the three thousand one hundred and thirty-six miners examined, nine hundred and ninety, or 32 per cent., were classed as having miners' phthisis in one or other of its stages. They might expect, therefore, that out of the total number of underground miners (eleven thousand four hundred) on the Rand, the number of non-affected will not be far from three thousand six hundred. The results of examination showed that the order of greater risk in the chief occupations was as follows:—(a) Machine drillers; (b) trammers; (c) hammer men; (d) timbermen; (c) other occupations (excluding surveyors and samplers)

AGE QUESTION.

Discussing the question of whether the age at which a man starts work underground affected his liability to the disease, the Commission decides in the negative. The Commission submits tables which show that of the 32 per cent. of miners affected, approximately two-thirds fell into Class 2. The average duration of underground work among those affected in Class 2 is rather over eight years, the figure ranging from three to thirteen years. Many men in this class, says the report, might return to non-mining work and be capable of earning a livelihood for a considerable, and even in some cases, an indefinite number of years. Among machine drillers the Commission finds that of a total number of nine hundred and eighty-seven men examined, 48 per cent. were affected, against 32 for the general body and 21 per cent. for those who have never done machine drilling. The report lays stress on the statement that the disease is more rapid, more intensive, and more regularly progressive among machine drillers than among any other group of underground workers, and that no class of underground workers is free from serious risk of attack.

MINERS AND CARELESSNESS.

"It has often been said," adds the report, "that the carelessness of the miners themselves in neglecting the use of ordinary precautions is an important factor in the causation of miners' phthisis There is no doubt that the miners as a body are prone to keep to traditional ways of work, and are slow in availing themselves of methods which cost time, and whose immediate advantage is not apparent. There is no doubt also that some are culpably careless, but the fact that the incidence of the disease falls heavily on all classes of underground workers, not excepting the supervisory class, is sufficient proof that the habits of the miners in this respect is not a critical factor in the prevalence of the disease."

Section (d) gives the conclusions drawn from the Miners' Phthisis Board cases. It shows that the average years underground for men who have never done machine drilling is seventeen years, and for those who have spent the whole time machine drilling little over eight. The Commission considers that tuberculosis is not common in the early stages of miners' phthisis, and does not become an important feature until the disease is far advanced. "This seems to indicate, though not to prove, that infection is the main, though not the chief, source of infection, but this is a matter that requires further investigation."

Section (e) gives the conclusions drawn from death returns, and Section (f) deals with the general aspect. The Commission points out that during the last three or four years much attention has been devoted to the question of mine ventilation, and that in 1909 a general system of mechanical ventilation was installed in the East Rand Proprietary Mines. Since that date fan ventilation has been introduced by other companies. The report further states that there appears still to be urgent need for a combined experimental investigation on the part of the Government and the mine managements, which should aim at the elaborate introduction and operation of a uniform systematic standard of the practical methods which should be applied to each form of mining work in detail. This policy when agreed on must be uniformly enforced.

APPLICATIONS FOR COMPENSATION.

Section (g) deals with the number applying for compensation annually. On this subject the report states that during the seven months the Miners' Phthisis Board has been sitting there were six hundred and thirty-three applications for relief, and during the last four months the applications averaged three a day. The Commission estimates that from one thousand to one thousand two hundred claims may be expected annually, and that the mean expectation of life will be from one and a half to two years.

In Part 3 of the report dealing with legislative provisions, the Commission quotes at length from the report of the English Departmental Committee on Industrial Diseases, 1906, and arrives at the conclusion that miners' phthisis is a definite, and in its intermediate stages a sufficiently distinguishable trade disease specific to the employment in the gold mines of the Rand, and that a pure tuberculosis occurring in a miner cannot be so regarded. The report goes on to deal with the objections urged by the English Departmental Committee to scheduling fibroid phthisis, one being the difficulty of allocating the responsibility jointly on all employers for whom the claimant had worked during a period of five years prior to his incapacitation *pro rata* to the time worked by him for them. The second objection of the English Committee was the difficulty of giving demonstrative proof of the disease, and the risk of dismissal from employment, on suspicion that the disease is present in an early stage. The English Committee suggested some scheme of mutual insurance. Proceeding to criticise those objections, the Commission considers that the objections do not apply so strongly in the case of miners' phthisis in South Africa. Though difficult to diagnose in early stages, the disease develops much more rapidly than in England, and the period of uncertainty is much shorter. If, the report adds, the whole onus of compensation were to be thrown on the employers they would undoubtedly take measures to protect themselves by insisting on medical examination and by taking up the position that on a miner leaving one mine and going to another he should again be examined, and if signs of fibrosis were present he would not be accepted for employment. Such a policy, if carried out strictly, would become a source of friction. However, if the examinations were conducted in such a way that only men who showed definite and actual commencing incapacity were rejected, it would be in the real interest of the affected men themselves to remove men from underground before they were finally incapable, and it would be in the interest of the mining companies, who would have to pay a lesser sum in compensation for partial than for total incapacitation.

PROVISION FOR EARLY CASES.

The Commission considered that some provision should be made for early cases of the disease, and since in such cases it is assumed that the working capacity is still good, the Commission recommends that compensation should consist of a moderate sum and should carry with it the provision that its acceptance involved the prohibition on the part of the recipient of all further work underground. The report goes on: "What is desirable is the elaboration of a policy which would automatically and without friction provide for the reasonable claims of those affected. Whether that policy can best be reached by throwing the onus of compensation on the employers, or whether the difficulty might be better met by a system of mutual insurance between employers and employed, or by treating miners' phthisis and other industrial diseases as part of a general scheme of national insurance, or possibly by a combination of methods, are questions the further discussion of which goes beyond the purely medical standpoint, and which do not therefore fall within the terms of our reference."

Then follow the recommendations enumerated above. To the report is added a statistical appendix with twenty tables giving details of the investigations of the Commission, together with various diagrams.

INVESTORS' DIARY.

The following company meetings have been announced:—

April 12.—Transvaal Consolidated Lands.

April 17.—South Randfontein Deep.

April 25.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep; Cloverfield (Extraordinary General Meetings).

April 30.—New Era; Springs Mines; Brakpan Mines; Transvaal Coal Trust.

May 2.—Meyer and Charlton; New Goch; Roodepoort United; West Rand Consolidated.

May 3.—Cinderella Consolidated; Aurora West; Rand Collieries; New Steyn Estate; Sacke Estates.

May 8.—Roberts Victor Diamonds.

May 10.—Ferreira Deep; Ferreira G.M.; Knight Central.

May 17.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep (Extraordinary General Meetings).

May 18.—Aurora West.

May 22.—Apex Mines; New Kleinfontein.

May 23.—Benoni Consolidated; Crown Mines; National Bank (at Pretoria).

May 29.—Robinson G.M. Co.; New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.

May 30.—Village Deep.

June 4.—Ferreira G.M.

June 5.—Rand Mines.

June 21.—New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.

June 26.—Transvaal Consolidated Lands.

July 19.—Transvaal Consolidated Lands.

THE YEAR WITH THE SIMMER DEEP.

Plant only Worked to 70 per cent. of its Capacity—Development Values.

Mr. C. D. Leslie, the Superintending Engineer of the Simmer Deep, reports as follows for 1911 :—A reestimation of the ore reserves showed that there were fully developed at the end of the year some 1,312,000 tons of payable milling ore of a value of 4.9 dwts., made up of 49 per cent. of Main Reef valued at 5.0 dwts., 20 per cent. of Main Reef Leader valued at 4.9 dwts., and 31 per cent. of South Reef valued at 4.8 dwts. Of this ore 84 per cent. is valued at 4.61 dwts., and the remainder at about 6 dwts. In addition there are some 263,000 tons of partially developed ore of an indicated grade of 4.8 dwts. The development disclosures were discouraging in the eastern section, but a slight improvement has to be recorded in the western section of the property approaching the Jupiter Mine. More of the development work than formerly is being extended westwards from the west (Milner) shaft to exploit this large area, in the hope of securing an increase in the payable tonnage exposed per foot of development advanced. Although the development footage was reduced by over 26 per cent., the ore reserves are 57,000 tons in excess of the previous year. This was partly accomplished by exposing, by means of cross-cut raises from the Main Reef, not only the full section of Main Reef, but also the Main Reef Leader and South Reef in the hanging-wall. On account of the large proportion of ore which remains to be exposed in this way, it is safe to assume, with the working costs now obtaining, that the ore reserves are well ahead of the mill, and, as pointed out in last year's report, development of ore by this means can be undertaken rapidly and economically. Taking the basis of tonnage of ore milled from declared reserves during the past year, the fully developed ore reserves, as recorded above, would provide a three years' supply for the mill. The policy during the year has been to mine, as far as practicable, ore from stope faces which would yield an average value approximating that of the ore reserves, and ore from this source supplied 79 per cent. of the tonnage treated, the balance being made up of reclamation rock—comprising ore mined from the foot and hanging walls of stopes, sweepings, etc.—and sections of development ore which could be treated at a profit. A large proportion of the reclamation rock consisted of ore mined from the foot-wall of old stopes, after waste rock lying in position above the reef had been removed and utilised for rock-walling to support the mine workings. That portion of the waste rock built up in stope packs during the year has been measured, and is equivalent to a rate of sorting of slightly over 2.5 per cent. of the total tonnage mined, but no allowance has been made for this or other "waste" stowed underground in the record of waste rock sorted out as per your manager's report. Of the total tonnage mined 66.5 per cent. was broken by machines as against 49.7 per cent. for 1910, being an increase for 1911 of 16.8 per cent. Notwithstanding this extended machine stoping, it was found possible to keep an average stoping width of 57½in., which corresponds with the actual width mined on the basis of tonnage removed from stope faces. By means of small rock-drills of the hammer type, it is hoped eventually to compete successfully with hammer boys in cost as well as in width of stoping, both of which react on profits. As compared with the previous year the results show an increase of some 60,900 tons milled; a reduction of 4.729d. per ton milled in the recovery value; an increase of 0.418d. in working expenses, and a decrease of 5.147d. per ton milled in profit on working, the total reduction of profit on working amounting to £3,929. The mine operated with an average of 65 less natives than during the previous year, and the cost of native wages and compound expenses, exclusive of recruiting charges and registration, was higher by 2.128d. per shift worked, equal to £7,441, or 3.297d. per ton milled. During the previous year the working expenses per ton milled had the benefit of some 46,000 tons milled from development ore at grass, which was exhausted in June, 1910. The total working expenses of 16s. 7.757d. included an expenditure of 2s. 1.104d. per ton milled, which represents the total actual cost of development during the year, viz., £50,421 8s. 4d., plus 3d. per ton milled equals £6,210 12s. 6d., which was set aside as from 1st February, 1911, for excess development, should this become necessary in the future. The development cost was reduced by 6s. 10d. per foot advanced, being equivalent to a saving of over £5.500 on the footage accomplished during the year. The working costs for the first half of the year averaged 17s. 1.493d., and for the second half 16s. 2.542d., equal to a reduction of 10.951d. per ton milled. From information so far available the recovery value of the ore reserves, together with reclamation and development rock which can be milled concurrently therewith at a profit, may be taken as approximating 18s. per ton milled, and an increase in profit in the future must mainly depend on reduced working costs. Towards this end some success is being met with in securing more native labour in order to raise the tonnage to the capacity for which the existing lay-out of the mine, its plant and equipment are designed. Considerable importance attaches to the loss incurred through the various units being worked at an underload, and it may be taken that other units are underloaded somewhat proportionately to the reduction plant, which during the year was operated at only 70 per cent. of its capacity. To further help the position, special attention is being given to :—(1) Improvement in health conditions underground; (2) mechanical replacement of native labour. To get the maximum profits, while avoiding the depletion of ore reserves of a value in excess of their average, and also while maintaining the plant and equipment at full efficiency, more rigid economy is practised on low-grade mines than is generally realised, and the manager and staff of such mines as the Simmer Deep require every support and encouragement to hearten them in their strenuous work under conditions which need all their energy and pluck to surmount.

MANAGER'S REPORT.

The Manager, Mr. H. S. MacGregor, writes, *inter alia* :—The following report covers the operations of this company for the year ended 31st December, 1911 :—Crushing—Average number of stamps running, 125.550 tons; tons mined, 585,503; waste sorted out, 45,522 = 7.775 per cent; tons sent to mill, 539,981; add tons taken from stock in bins, 1,719; tons milled, 541,700; days milling, 342.795; tons milled per stamp per day, 12.587; days an average of 7 tube mills ran, 336.703. The reserve of milling ore developed at 31st December, 1911. is estimated at 1,312,000 tons of an average assay value of 4.9 dwts. per ton, and some 263,000 tons of partially developed ore valued at 4.8 dwts. The water pumped and baled during the year amounted to 42,285,000 gallons. The whole of the construction work at the reduction works is now complete and in good working order. An American Stirling boiler has been removed from the Rhodes shaft and installed at the Rudd shaft. A Sirocco fan, 11 feet in diameter, and capable of extracting 350,000 cubic feet of air per minute, has been installed at the Rudd shaft. A 13-in. × 26 in. Robey winding engine has been removed from the Rhodes shaft and erected at the Rudd shaft for the purpose of baling water in the event of a breakdown or accident to the engine now doing that work. The Clement Shaft Compound has been completed and is in occupation. Four brick cottages for married employees, 20 single men's rooms, also in brick, have been built, and a brick house for the resident secretary is in course of erection. The labour supply has not been very satisfactory during the past year, as our daily average of natives in the compounds has decreased from 2,984 in 1910 to 2,919 in 1911. Notwithstanding this, and owing principally to the use of small machines, we have been able to mine 101,000 tons of ore more during 1911 than we did in 1910. the stoping width being practically the same.

Brakpan Mines.

The following information with respect to the March output and the reserve gold account has been issued:—Stamps working, 110; running time, 30 days; ore crushed, 46,782 tons; tube mills working, 6; ore hoisted, 56,882 tons; ore from dump, 1,430 tons; waste sorted, 16·17 per cent.; fine gold declared, 15,931 ozs.; value declared, £67,213, equal to 28s. 9d. per ton milled; working costs, £41,094, equal to 17s. 7d. per ton milled; working profit, £26,119, equal to 11s. 2d. per ton milled; added to gold reserve, 1,000 fine ozs.; total gold reserve, 3,800 fine ozs.

Mr. C. E. Knecht, of the Consolidated Mines Selection Company, is taking over the management of the Brakpan Mines until Mr. C. R. Davis (the newly-appointed manager, *vice* Mr. C. B. Brodigan, resigned) returns from short leave.

The following tenders have been accepted by the P.W.D., for the various services mentioned, viz. :—

Sutherland and Co., Box 96, Volksrust, £5,799; erection of police quarters at Wakkerstroom.

A. G. Dunningham, Vrede, Orange Free State, £2,186 5s. 3d.; erection of magistrate's residence at Vrede, Orange Free State.

G. Hausleitner, Box 615, Pretoria, £6,575; erection of public offices, Vryburg, Cape Province.

Brown Bros. and Reid, Hatting Spruit, Natal, £725; additions to gaol at Dundee, Natal.

Waters and Clarke, Box 4789, Johannesburg, £1,170; erection of forester's house, Graskop, Middelburg, Transvaal.

Wm. Bain & Co., Ltd., Box 2724, Johannesburg, £3.135 15s. erection of bridge over the Pot River, Maclear, Cape Province.

Wm. Bain and Co., Ltd., Box 2724, Johannesburg, £4,176 16s. 5d.; erection superstructure for Kraai River Bridge, Barkly East.

C. R. Whitwam, Box 247, Boksburg, £3,477; erection of married warders' quarters, Boksburg Prison.

J. E. Dike, 106 Church Street, Capetown, £1,363; erection of Native Inebriates' Prison, Kluitjes Kraal, Forest Station.

THE JUPITER 1911 REPORTS.

Reduced Profits Owing to 60 per cent. only of Plant Employed—Satisfactory Development Values.

Mr. C. D. Leslie, the Superintending Engineer of the Jupiter, reports as follows for 1911:—The reserve of payable fully developed ore is estimated at 1,089,000 milling tons of an average assay value of 5.74 dwts., and there are some 245,000 tons of partially developed ore of an indicated grade of 5.2 dwts. In addition, some 230,000 tons of fully developed ore of a value between 4 and 4.5 dwts. are excluded from the ore reserves until reductions in working costs are effected which will warrant their inclusion. The elimination of this low-grade rock has the effect of raising the value of fully developed ore, as recorded above, by 0.3 dwt. per ton. Development disclosures continue to expose satisfactory values in the eastern section, but disappointing values are being met with in the far western section of the mine. Of the ore from stope faces 66 per cent. was broken by machines, being an increase of 22 per cent. as compared with 1910, which caused an increase in the average stoping width of only 1¼ inches. Your manager is experimenting with small rock-drills of the hammer type, by means of which he hopes eventually to compete successfully with the hammer native in both width and cost of stoping. It was considered advisable to resort to more packing of waste rock underground for the support of the mine workings, and waste rock equal to 2.6 per cent. of the total tonnage mined was built into packs as against 0.75 per cent. during the previous year. This and other "waste" stowed underground is not shown as waste rock sorted in your manager's report. As compared with the previous year there was an increase of 47,252 tons treated, with an average increase of only 41 natives at work; a reduction of 5.766d. per ton milled in the recovery value: an increase of 10.185d. in working expenses, and a decrease of 1s. 3.951d. per ton milled in profit on working, the total reduction of profit on working amounting to £13,726. Approximately 7 per cent. of the tonnage milled was taken from development or lying at grass, as against 16 per cent. for the previous year. As would be expected, the decreased tonnage from this source had the effect of raising the cost per ton milled, which for 1910 amounted to 20s. 3d., and for the first six months of 1911 to 22s. 3d. During the latter half of 1911, however, working costs were reduced to 19s. 5d. per ton milled. Owing to continued shortage of native labour the reduction plant was worked at only 60 per cent. of its capacity, and because the general lay-out of the mine, its plant and equipment was underloaded, the property was worked more expensively than if the full tonnage could have been dealt with. The development footage was increased by 3,646½ feet as compared with 1910, and the increased amount charged to working costs for development was £9,790 10s. 11d., equal to 7.468d. per ton milled, which included 3d. per ton = £1,512 10s. put aside as from 1st September last for excess development, should this be required in the future. The cost of native wages and compound expenses, excluding recruiting and registration of natives, was 2.448d. per shift worked more than during the previous year, equal to £5,999, or 4.576d. per ton milled. A large Sirocco fan is being installed to help underground ventilation, and special attention is being given to the allaying of dust and generally improving health conditions in the mine. Many trying conditions are associated with working at a depth of nearly one mile from the surface, and gratifying progress has been made during the year in overcoming them under discouraging circumstances, which have greatly taxed the energy of your manager and his staff.

Manager's Report.

The manager, Mr. J. M. L. Henry, writes, *inter alia*: Average number of stamps running, 73; tons mined, 323,541; tons taken from surface dumps, 23,530; percentage of waste sorted out, 9.180; tons milled, 314,650: days milling, 339.847; tons milled per stamp per day, 12.683; average number of tube mills running in January, 7 jointly, 3 own account; February-December, own account 4.909. Howard incline: No shaft sinking was done in the Howard incline during the year and the depth remains the same as in the last report, 1,712 feet, but a large amount of equipping was carried out. The two eastern compartments were laid with 60lb. rails and rollers throughout. The shaft was stripped where necessary to accommodate the big six ton skips, and tips for same were put in at the top of the incline. A loading station, with box and measuring bins, was put in below the 6th level, and another loading station below No. 8 level is nearing completion. In addition, the stations at each level of the incline had to be enlarged. A sump has been cut out at the 10th level. Catlin incline: This incline was sunk 451½ feet during the year, to a total length of 1,163½ feet, the vertical depth from the surface being 4,970 feet. The two eastern compartments were equipped with 60 lb. rails and rollers throughout, the stations enlarged and tips at the top of the incline put in. This shaft emerged from the dyke, in which it had been for more than 1,000 feet, at the 1,330 feet mark, and is now in quartzite. A new level, No. 11, was started off 500 feet below the No. 9 station, and about 250 feet of driving has been done on the south reef in highly satisfactory values. The present bottom of the shaft is nearly to the 13th level, where a station will be cut and development put in hand. Development: The total development footage for the year is 11,349, an increase of 3,646½ feet over 1910, the details being as follows: Development footage: Drives, 4,421 feet; raises, 2,983½ feet; winzes, 1,084½ feet; cross-cut raises and cross-cut winzing, 2,857 feet; total, 11,349 feet. In addition to this there is a large cubic footage of stations, and ore bins and sumps. There is also a large footage of stope driving and raises through faults chargeable directly to stoping account. Construction.—Surface: The following work, which was in progress at the date of the last annual report, has been completed during the year: Extensions to Howard sorting and crushing plant, condenser for Catlin hoisting plant, 30in. x 60in. man hoist for Howard shaft. In addition to this the following new work was taken up and finished wholly within the year: New 50 drill electrically driven air compressor, additional explosives magazine, new native time office, main office extension, ash handling trestle, Catlin shaft. Underground: The following underground construction work, in addition to that mentioned under shaft sinking, has been completed during the year: New 10in. air main down Catlin vertical shaft, power cables for electric winders down both shafts, engine chamber and electric winder, with sheaves, etc., etc., Howard incline; engine chamber and electric winder, etc., etc., Catlin incline; 3 3-deck cages, Howard vertical shaft; 3 2-deck cages,, Catlin vertical shaft. The necessary tipplers, grizzlies, and sidings wherever required underground were installed. A large extension and reconditioning of the underground water service was carried out during the year. Rand Water Board water has also been carried into every working place in the mine. The native labour supply has again been unsatisfactory throughout the year, the number of labourers in the compound in December being practically 400 short of what it was at the end of January, 1911, and we are now roughly 700 short of our minimum requirements. On account of the labour shortage, stoping by machine has been largely extended during the year, until at the end of December the percentage mined was: by machines 76.10 per cent., and by hand 23.90 per cent., the corresponding figures for January being 37.24 per cent. by machines, and 62.76 per cent. by hand. Labour saving: The question has been given attention during the year, and an adaptation of the hammer drill to drill wet holes with hollow steel has been tried with encouraging results. During December the drilling accomplished by a native using this system has been a little more than four times the average accomplished by a hammer boy.

New Cape Companies.

Registered in February.

Cohen and Tyfield, Ltd.—Registered office, Capetown. Directors: Abraham Cohen and Mark Tyfield. Capital, £1,000. Registered February 3rd.

The Spreeuwfontein (Prince Albert), Gold Mining Syndicate, Ltd.—Registered office, Capetown. Subscribers: J. E. Howell, Thos. Ferguson, S. Stanbury and four others. Capital, £1,000. Registered February 9th.

Whitaker's, Ltd.—Registered office, East London. Directors: J. J. Whitaker, W. Bradford and T. J. Fish. Capital, £5,000. Registered February 12th.

The Finance Company, Ltd.—Registered office, Capetown. Subscribers: J. W. Stigling, A. W. Robinson, J. MacDonnell, and four others. Capital, £2,000. Registered February 24th.

The Buffalo Gold Mine Development Co., Ltd.—Registered office, Capetown. Directors: Sir Pieter Faure, K.C.M.G.; J. M. Joyce, A. J. Chiappini and two others. Capital, £25,000. Registered February 9th.

South African Biograph Co., Ltd.—Registered office, Capetown. Directors: J. H. Hartley, E. A. Payne, and D. W. Hopkirk. Capital, £1,500. Registered February 29th.

African Rubber and Retreading Co., Ltd.—Registered office, Capetown. Subscribers: A. Wyburd, W. Hinton, S. N. Stony and seven others. Capital, £2,000. Registered February 27th.

Park Swimming Baths Co., Ltd.—Registered office, Uitenhage. Directors: A. MacPherson, O. R. Larson, G. F. Freer, C. Fuller, and W. R. Burch. Capital, £200. Registered February 5th.

The Newlands Gekleurde Landbouw Compagnie, Ltd.—Registered office, Knysna. Subscribers: C. J. Meyer, L. du Plessis, M. Adonis and seven others. Capital, £2,500. Registered February 17th.

INCREASES OF CAPITAL.

Madibi Tribute Syndicate, Ltd.—Capital increased from £5,200 to £8,200. Registered February 10th.

De Humansdorp Dors Machine Maatschappij, Beperkt.—Capital increased from £700 to £1,100. Registered February 16th.

Rhodesian Section.

LATEST NEWS FROM RHODESIA.

The February Output— Returns of Lomagundi Mines—The Hay Mine—A New Railway—Work on the Athens Suspended—Somabula Diamond Diggings.

The mineral output of Southern Rhodesia for the month of February has been declared at £224,982, as compared with £244,044 in January. Having regard to the shorter month, the decrease is of no real consequence or importance. The two months' figures for the various details of mineral production read as under:—

January.

Gold	£214,918
Silver	1,461
Chrome iron	19,625
Lead	657
Coal (sales)	7,383
Wolframite	—
Total	£244,044

February.

Gold	£209,743
Silver	1,470
Chrome iron	7,000
Lead	633
Coal (sales)	6,036
Wolframite	100
Total	£224,982

From the above tables it will be seen that there was a decrease, more or less substantial, in the production from each department of the industry, except silver and wolframite, the increases in these latter being trifling. The drop in the chrome iron output, though apparently large, is really unimportant, for, as already explained, the figure has no relation to the tonnage mined at Selukwe, but is limited by the varying nature of the shipping facilities at the port of Beira. Developments at the mine are said to be progressing very favourably. The decrease in the value of the coal sales from the Wankie Colliery are more noteworthy, these showing a total fall, since December, of over two thousand tons. As usual, however, chief interest centres in the figures of the gold output. These, at 49,863 ozs., worth £209,743, show a decline, when compared with January, of 1,112 ozs. in weight and £5,175 in value, though they record a slight improvement on the figures of the corresponding month of last year The following table gives particulars of the production and dividends of Rhodesia's gold industry during the past ten years:—

1902	£687,096	£98,475
1903	827,729	64,200
1904	969,343	6,125
1905	1,449,985	45,000
1906	1,985,099	62,812
1907	2,178,886	112,113
1908	2,526,007	96,551
1909	2,623,788	161,875
1910	2,568,201	431,347
1911	2,647,895	584,128

* * * *

The great bulk of the gold production of the Lomagundi district of Mashonaland is, of course, declared by the Eldorado Banket Company, but it is of interest to note that two or three new small producers have recently commenced work in this district. The Kia-Ora has been at work for some years past. The output of this concern for February was, however, only £52, or 12 ozs. No stamps were at work, and the declaration is simply the result of a clean-up. The Shankuru is also a producer of some years' standing. It is now being tributed by Messrs. Harries and Anderson, and with only two stamps in operation produced no less than 166 ozs. from the mill and 25 ozs. from the cyanide works. The total value of the production was thus over £800. The Shankuru, it may be recalled, is one of the properties acquired by Mr. R. R. Hollins. Other small properties in this area now producing are the Gella (Messrs. Hudson and Frost), the Linnett (Mr. A. L. R. Morkel), the Lone Hill (Messrs. Day and Hallward), and the Vulcan (Vulcan Syndicate). The first-named is a three-stamp proposition, and the other mines mentioned have only two stamps each. The reduction plant of the Eldorado, which consists of two Chilian mills and 20 stamps, continues to be kept constantly at work. During February 7,248 tons were milled and 7,606 tons cyanided.

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From all accounts things are not proceeding at the Hay mine as well as was hoped, and the results of the recent crushings are disappointing. Development, too, has not worked out as well as was expected, and prospects for the future are said to be by no means encouraging. Shares do not fall from 30s. or 35s. to below 10s. for nothing, and the *fons et origo* of this lamentable drop is not far to seek. Reports cabled to London have depressed the stable, and support to the market has consequently been wanting. Something, however, has, it seems, got to be done, and the latest rumour is that the Botha and Promoter claims, which belong to the same group, are to be amalgamated with the Hay.

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It is reported in Bulawayo that Sir Charles Metcalfe, accompanied by Mr. S. F. Townsend, has just paid a visit to the Planet-Arcturus mine for the purpose of viewing the surrounding country from a railway point of view. Wood fuel is scarce in this district, and before long it will be necessary to use coal. It is, therefore, hoped at no distant date to have the mine connected with the Umtali line at a point some 20 miles to the north of Salisbury. Earthworks for the new line to the Shamva are now being thrown up with great speed, owing to an improvement in the labour position in that part of the country, as a result of which the contractors have been able to secure a number of additional boys. This work is now proceeding at five different points on the route.

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Development work on the Athens mine, in the Umvuma district, has been temporarily suspended. This has been the means of increasing supplies in the local "labour market," most of the released boys having obtained work close by.

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We are pleased to hear that the fields on Willoughby's ground are again drawing some attention from the diggers. At the present time Mr. Lloyd is the longest resident, but we hear that Mr. Vernon has struck a patch of payable gravel, and is doing quite well. The latest arrival is Mr. Willis, who is to commence operations on a fairly large scale. He is very sanguine as to the f[illegible] considers that better results can be obtained at Somabula than on the river diggings. If his experiments come up to expectation, several more diggers will soon arrive from the south. A six and a half carat diamond was discovered a few days ago.

SOUTHERN RHODESIA COPPER.

Operations of the S.A. Copper Trust—Reopening of the Umkondo and Edmundian.

Although large deposits of copper occur in several widely separated districts of Southern Rhodesia, the production of this metal to date has not been more than 359 tons, the great bulk of which has been won from the East Gwanda Mines in Matabeleland. The Victoria, Lomagundi, Tuli, and Umtali districts each contain areas of auriferous country, but for several reasons the potentialities of these have been more or less neglected. About a year and a half ago the South African Copper Trust, Ltd., was formed with a nominal capital of £375,000 for the purpose of taking over the assets of the Consolidated African Copper Trust, consisting of 1,939 copper claims in the Lomagunda, Victoria, Tuli, and Umtali districts of Mashonaland, and in the Kafue district north of the Zambesi; two coal areas in the Victoria district of Mashonaland; a half interest in seven Namaqualand Copper leases; two farms of 1,500 morgen each in the Lomagunda district, Mashonaland, and an 80 per cent. interest in the capital of the Edmundian Copper Mining Co., Ltd., whose properties are situated about 12 miles east of Umtali in the Mozambique Company's territory.

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The most important of the mines embraced by the operations of the South African Copper Trust is in all probability the Umkondo, a property situated in the Victoria district, and one which would, if situated nearer the railway, have been a producer of some importance. On the taking over of the property by the South African Copper Trust, Mr. Hy. Ewer Jones examined the mine, and, acting on his advice, the directors gave instructions for work to be commenced there. In the past excellent results were obtained from the lode, and about 90,000 tons of ore containing 8 per cent. copper have been developed, the length of the pay ore being some 400 ft. A main shaft has been carried down to a depth of about 180 ft., and at 164 ft. the top bed was met and found to be 4.5 thick, assaying 10.3 per cent. copper. An incline shaft has also been carried down on the reef to a depth of 145 ft., the average value being about 6.5 per cent. copper over a width of 51 ins., at which depth a fault was encountered and the reef lost. Another shaft, called the Ventilation Shaft, was sunk about 400 ft. from the main shaft, and in this the ore body was expected to be reached, but after being sunk to a depth of 130 ft., the ore bed not being struck, work was abandoned. The engineer is of opinion that in order to determine the nature of the fault encountered it will be necessary to sink this Ventilation Shaft another 300 feet. This opinion coincides with that of Mr. E. P. Mennell, who in his geological report considers that there was a change of formation at the bottom of this shaft, where shale, similar to that exposed in the main shaft, was met with. The directors are therefore carrying out these recommendations, which it is estimated will cost £4,000, the data obtained from which will enable a definite programme of operations to be decided upon. The Edmundian Mine is not in reality a Rhodesian proposition, as it just over the border, and in Portuguese territory. It has, however, been financed and operated by Rhodesian companies, and has always been regarded in the light of a Mashonaland venture.

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Operations here were suspended in September, 1911, in consequence of the breakdown of the plant. The position of the mine at that time was as follows:—The main shaft had been sunk to the 9th level, at which point a station was cut. At the 8th level the reef, while similar to the upper levels, was found to be of shorter lateral extent, viz., 115 ft.—as against 135 ft. in the 7th level—the value being 13.5 per cent. copper over 28 ins. A winze had been sunk 70 ft. on the pay chute from this level, good ore being encountered, but at this point the reef became narrow and sinking was discontinued. The engineer advises that the 9th level should be opened up before any definite opinion can be formed as to whether this failing off in the winze is merely a temporary squeeze, or whether it will seriously affect the future of the reef in depth. The engineer has therefore recommended that a preliminary expenditure, estimated at about £7,500, should be undertaken for the purpose of repairing the power plant and opening up the 9th level. This work is now being proceeded with. In addition to the work on the above properties, the whole of the company's claims have been reported on by the engineer, who advises the abandoning of some of them, the value of which does not justify any further expenditure thereon. The new Mining Ordinance of the British South Africa Co. comes into force in January next year, when all claims will have to be worked or inspection paid thereon unless in the immediate vicinity of properties on which development work is being carried out. The directors have therefore instructed Mr. H. A. Piper to report on these properties, and in the event of his report confirming that of the engineer, the following blocks, viz., Loupangwan, Edward, Dandy Copper and Paul, will be abandoned.

No mention is made in the report now to hand of the Northern Rhodesian claims, but in view of the activity now being displayed in certain areas north of the Zambesi, and because of the forthcoming promulgation of a Mining Law for Northern Rhodesia, a certain amount of interest attaches itself to them. The balance sheet shows that 1,018,735 shares of a nominal value of 5s. each have been issued.

Heroine.

Mr. A. Mulliner presided at the first ordinary general meeting of shareholders of the Heroine Gold Mining Company, Limited, which was held this week, at Capetown. The report stated that the capital of the company remained at £9,000 in 18,000 shares of 10s. each. The property consisted of 110 claims, viz.: 11 blocks of 10 claims each are contiguous, situated in the Hart'ey District, South Rhodesia, about three miles from Umsweswe Halt, on the main line from Bulawayo to Salisbury; and of two separate blocks, each of 10 claims, in the same district, but some distance from the above-mentioned 9 blocks. Two of the 9 blocks had been acquired during the last few months. Since the formation of the company, development work has been continuously in progress, with the limited capital at our disposal. The main shaft of the Heroine Mine is now 214 feet deep. The ore at present developed is estimated at 2,000 tons—value 10 dwts. per ton. A trial crushing of 65 tons of this rock was done in November, and gave a result of 59 oz. over the plates and cyanide equal to 18.15 dwts. per ton crushed. Acting on the advice of the consulting engineer, a 2-stamp Fraser and Chalmers battery was purchased and erected for the purpose of crushing development ore from the mine, but it has been found impracticable to keep the mill at work on this ore, and it has been used entirely, with the exception of the trial crushing mentioned, for crushing rubble. Gold has been obtained of the net value of £1,988 7s. 9d. from 1,391 tons crushed, equal to 28s. 7d. per ton. "It is difficult," continued the report, "to calculate the exact quantity and value of the rubble on the property, but the managing director estimates the quantity at 75,000 tons, of a value of 3½ dwts., giving a profit, when worked, of 9s. per ton. A more moderate estimate has been made, giving, say, 40,000 tons of 4 dwts. value. It will therefore be seen that this is a very valuable asset. It has been the intention of the directors for some time past to erect additional plant to treat the rubble, and at the same time proceed with the development of the mine. To provide funds for these objects the shareholders were called together on December 11, 1911, and authorised the increase of the nominal capital from £10,000 to £20,000. This authority was confirmed at a confirmatory meeting, held January 8, 1912. Negotiations have been in progress for the disposal of the reserve shares, but up to the present the directors regret that they have not come to a successful issue. You will notice from the balance sheet that the funds of the company are practically exhausted, and that we are dependent on the returns from the mill to pay current expenses, and from that it is necessary to provide further capital without delay, if the operations of the company are to be carried to a successful issue."

Bucks Reef February Returns.

The following are particulars of the February output, viz.:—Tons crushed, 641; yield, £2,195 3s. 4d.; profit, £313 12s. 1d.

RHODESIA'S MINERAL OUTPUT.

Details for February—A Decreased Return.

We have received from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of February, 1912, with comparisons and values:—

GOLD.

MATABELELAND.

Bulawayo District—	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
Agincourt (Est. S. Roodt, deceased) ...	5	184	71.30	312
Alice, Atlas & Anderson's (R. Barkley)	10	700	127.52	536
Antenior (E. Granger and Co.)	2	145	49.71	209
Baby Tailings (J. Parkhurst)...	—	520	16.60	67
Bengali (Arbery & Hicks)	5	420	55.20	232
Do. (tailings)	—	208	7.38	31
Belingwe Main (J. Haswell)	5	370	60.56	254
Big Ben (W. E. Hunt)	4	134	138.75	583
Bridge (Bell & Ralstein) January... ...	2H	310	116.77	490
Do. February ...	2H	648	130.75	549
Bucks Reef G.M., Ltd.	5	641	439.64	1846
Do. (tailings)	—	475	84.66	356
Bulawayo Main A (R. A. Myburgh) (tailings)	—	700	59,34	219
Bushtick Mines, Ltd.	20 1C 2T	3664	221.10	928
Do. (tailings)	—	2320	438.97	1844
Do. (slimes)	—	1560	151.62	637
"C" (D. & C. Syndicate)	10 1C	1539	135.20	568
Do. (tailings)	—	1198	113.54	477
Do. (slimes)	—	341	110.59	461
Castle Grant (M. Kominsky)	2	25	33.20	139
Central D.B. (A. D. Gunn) (tailings)	—	200	18.70	79
Champion (R. Aserman)	5	771	213.05	895
Do. (tailings)	—	593	84.96	357
Claremont Mines (Rhod.), Ltd.	20	2097	661.63	2779
Clean Up (Belingwe G.M. Synd.).. ...	5	125	298.58	1251
Eagle A (Peard & McDonald & Co.).	5	373	63.69	267
Eagle C. (J. H. Smith) (tailings). ...	—	514	63.23	266
Ella's (D. Vincent)	4	61	29.88	125
Farvic (Rhodesia. Ltd.)	6 1P	667	524.03	2201
Do. (tailings)	—	400	37.91	159
Do. (slimes)	—	267	51.01	214
Intabanenda & Spitzkop (Estate B. Smallie, deceased)	5	298	42.22	177
Do. (tailings)	—	200	20.41	86
I.X.L. (Forbes Rhod. Syd. Ltd.). ...	5	654	243.03	1021
Jesmond (W. H. Robinson)	2	144	43.40	182
Do. (tailings)	—	100	16.25	68
Kalydon (Rose Mine Synd.)...	5	350	88.75	373
Khami (Cock Bros.)	11	81	13.38	56
Li Hang Chang (G. Leach)	3	120	25.18	107
Lonely Reef G.M. Co., Ltd.	15 2T	2260	791.81	3326
Do. (slimes)	—	3844	1833.74	7702
Mamba (clean up) (Rowe & Henry) ...	—	—	4.71	20
M'Takati (H. A. Tompkins)	(5)	83	59.15	248
N'Daba (M. Westerberg)	2	34	11.32	48
Ned's Luck (E. M. Haukins)	3	60	19.86	83
New Eclipse (J. R. Stewart)	4	500	224.08	941
Do. (tailings)	—	220	37.02	155
Newry (E. V. Campbell) (pannings) ...	—	—	3.57	15
North and Hanover (Hanover G.M. Synd.)	5	162	57.85	243
Do. (tailings)	—	300	37.14	152
Northern Star and Kimono (Peel's R. Synd., Ltd.)	10	1028	408.49	1716
Do. (tailings)	—	685	20.25	85
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	10 2P	1288	547.79	2301
Do. (tailings)	—	984	137.28	577
Penzance (R. Urquhart)	2	50	12.68	53
Do. (tailings)	—	100	37.10	156
Progress (H. V. Batten)	5	300	22.14	94
Queen's (Matabele Queen's Co., Ltd.)	10	1004	391.13	1643
Do. (tailings)	—	69	14.91	62
Queen's W. (Cummings & Berry)... ...	3	408	100.06	420
Do. (tailings)	—	405	146.31	615
Riversdale (Bruhns & Schwarz)	4	180	87.04	366
Romola Nigel G.M. Co., Ltd.	5	470	151.22	635
Do. (tailings)	—	330	42.75	180
Smiley D.B. (F. E. Davis)	5	105	66.57	280
Starr tailings (L. N. Papenfus)	—	300	34.04	143
Suffolk (H. D. Bishopp)	(5)	125	69.58	292
Susanna Mines, Ltd.	8	347	111.54	468
Trump (J. W. Thraves) (January) ...	—	20	8.46	35
Tuff Nut (King's Synd.)	5	600	385.46	1619
Do. (tailings)	—	285	54.63	229
Bulawayo District Total			11,034.43	46,339

Gwelo District—	No. of Stamps.	Tons Treated.	Yield Ozs	Value £
Arizona, No. 2 S. (Williams & Woodger)	2	125	120.65	507
Do. (tailings)	—	120	39.72	167
Brian Boru, slags (J. Jones)	—	—	5.01	21
Broad Arrow (Broad Arrow Syn.) ...	10	519	106.27	446
Do. (tailings)	—	400	10.94	46
Bute (T. Pedlow)	5	40	19.06	80
Csardas (Wolfshall Syndicate)...	10	401	371.51	1560
Do. (tailings)	—	308	65.88	277
Don No. 1 (Don Prop. Mines, Ltd.) ...	5	480	98.13	412
Do. (tailings)	—	259	17.61	74
Excelsior 1 W. (Crewe & Cameron) ...	5	89	19.72	83
Gaika G.M. Co., Ltd.	5 1C	2630	1119.44	4702
Do. (tailings)	—	1223	97.08	408
Gartley (Mrs. A. J. Grant)	2	28	12.84	54
Globe and Phoenix G.M. Co., Ltd. .	40 10P	5247	8112.83	34074
Do. (concentrates)	—	265	969.71	4073
Do. (slimes)	—	2551	342.84	1440
Gold Witch (Gold Witch Synl) (tailings)	—	800	44.07	185
Guinea Fowl (Sadler & Holloway) ...	5	460	13.40	182
Do. (tailings)	—	280	5.40	23
Murray (J. Fischer) (tailings)	—	510	20.30	85
Nevada (C. C. Hendrie) (January). ...	2	217	38.32	161
Do. do. (February) ...	2	229	29.88	125
New Dunraven G.M. Ltd.	5	591	149.39	628
Do. (tailings)...	—	556	23.87	100
Northallerton (Big Fortune Synd.) clean-up	—	—	7.03	29
North Bonsor (Cornish Syndicate) ...	15	951	155.36	653
Do. (tailings)	—	350	23.07	97
Pharos (Pharos Synd.)	2	103	46.56	196
Pretty Polly (New Rhod. R. Co., Ltd.)	5	480	190.59	800
Do. (tailings)	—	315	78.98	332
Prince George (J. H. Veasey)	5	210	58.42	245
Do. (tailings)	—	185	34.10	143
Do. (slimes)	—	260	31.21	131
Sebakwe D.B. (J. Maleham) (clean-up)	—	—	13.08	55
Selukwe Columbia G.M. Co., Ltd. ...	1C 3P	2657	889.43	3736
Do. (tailings)	—	1873	213.90	898
Do. (slimes)	—	831	108.90	457
Sheba-Bongola (Forbes R. Synd.)	5	375	309.82	1301
Dc. (tailings)	—	210	48.38	203
Tebekwe (Tebekwe Synd.)	12	1332	194.80	818
Do. (tailings)	—	1015	26.01	109
Wanderer (Selukwe) G. M., Ltd.. ...	4GR	17600	1608.89	6834
Wonderland (H. Nicholls) (talings) ...	—	25	3.60	15
Gwelo District Total			15,926.06	66,965
MATABELELAND TOTAL			26,960.19 ozs.	
VALUE			£113,304	

MASHONALAND.

Hartley District—	No. of Stamps.	Tons Treated.	Yield Ozs	Value £
Battlefields (Minaar & McArthur). ...	2C	1124	380.82	1599
Do. (tailings)	—	1121	161.06	676
Birthday A. and B. (R. J. Bray).. ...	2	114	19.57	82
Blue Rock (Ellsmoor & Goodyer)	2	205	86.50	363
Do. (tailings)	—	286	50.62	213
Brilliant (Mabel's Luck Synd.)	5	490	165.05	693
Do. (tailings)	—	315	134.00	563
Brilliant Exten. (C. G. Bennett) (tailings)	—	300	17.71	74
Buller (J. Gunn)	5	420	102.17	429
Do. (tailings)	—	310	90.24	379
Butterfly 1 N.E. (N. A. Arnold and Central M. and I Corp., Ltd.)	5	76	39.46	166
Do. (tailings)	—	—	10.17	42
Cam & Motor G.M. Co., Ltd. (tailings)	—	435	205.40	869
Concession (C. E. Simpson)	5 1C 2P	2281	619.08	2600
Corsilla. D. (H. W. Roberts)	2	29	17.79	75
Crown No. 2 (Crown Synd.)	2	100	30.81	126
Do. (tailings)	—	200	22.76	96
Dalny (Philip Wiggins. Ltd.) (tailings)	—	175	23.78	100
Dreadnought (W. E. Masters)	1C	820	48.17	202
Eiffel Blue & E. Ext. (Willoughbys Con. Co., Ltd.)	10	1235	682.22	2865
Do. (tailings)	—	690	56.96	239
Giant Mines of Rhodesia, Ltd. ..	30 2T	10500	4054.55	17,198
Glasgow (Glasgow Mines, Ltd.)	5	295	77.12	324
Glencairn No. 3 (Glenrosa Synd.). ...	4	366	357.37	1501
Do. (tailings)	—	414	82.62	347
Glendara (F. J. Nalty) (tailings).. ...	—	1200	87.53	368
Golden Valley (J. Mack)	5	450	129.00	542
Do. (tailings)	—	245	82.82	348
Goldmore (B. Secretan)	2	200	30.98	130
Do. (tailings)	—	130	33.22	140
Goodsman (Wm. James) (clean-up) ...	—	—	16.90	71
Do. (tailings)	—	52	22.24	93

	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
Grampian & B (Cron & Holloway) ...	(2)	100	11.56	49
Guelph (J. Davidson & Mrs. M. Davidson) (pannings)	—	—	1.60	7
Heathfield (D. M. McBarnet)	5	332	85.51	359
Do. (tailings)	—	240	22.61	95
I.X.L. (Heroine G.M. Co., Ltd.) ...	2	150	37.67	159
Jessie Palmer (Crown Synd.)...	(2)	30	10.30	42
Kanyemba (Kanyemba Synd.)	5	249	144.27	606
Do. (tailings)	—	200	55.64	234
Mali (McAdams & Harrill)	2	145	28.46	119
Masterpiece G.M. Co., Ltd.	5	716	318.39	1337
Do. (tailings)	—	375	44.85	188
Moliere (H. Moser)	5&11	700	87.74	368
New Topaz (J. Hardy)	211	500	73.03	307
Do. (tailings)	—	450	25.51	107
Oleander G.M. Co., Ltd.	3	108	67.23	282
Do. (tailings)	—	108	53.84	226
Owl (A. Rolfe)	5	752	408.81	1717
Do. (tailings)...	—	622	131.59	553
Pickstone, E. (S. L. L. Synd.)	4	398	305.51	1283
Do. (tailings)	—	300	65.68	276
Progressive E (R. R. Aitkin)	2	54	24.91	105
Revealed (Mrs. S. Smith)	1	5	5.81	24
Rhodesia Main No. 6 (Rhod. Main Reef Synd.)	2	130	30.66	129
Rouge 1 N (S. Rhod. M. Synd., Ltd.) January	5	757	65.30	277
Do. (tailings)	—	308	29.30	125
Do. February	5	564	48.20	205
Do. (tailings)	—	309	37.20	158
Shepherds (Phoenician Syndicate) ...	7	880	433.85	1822
Do. (tailings)	—	460	236.18	992
Stanley (Barrass & Allen) clean-up ...	2	16	3.93	17
St. Oliven No. 2 Yellow Jack Synd.)	2	80	38.90	163
Unknown (Brooks & Martin)...	2	89	16.56	70
Washington (I. J. Minaar)	5	350	442.74	1859
Do. (tailings)	—	290	34.78	146
Whistlecock, 1 W (T. McDowell)... ...	2	220	25.93	109
Do. (tailings)	—	160	43.28	182
Hartley District Total			11,436.02	48,210
LOMAGUNDI DISTRICT—				
Eldorado Banket G.M. Co., Ltd. ... 2C	20	7248	3500.35	14845
Do. (tailings)	—	7606	921.20	3907
Gella (Hudson & Frost)	3	40	26.28	110
Kia-Ora (Flowers & Brittain) (clean-up)	—	—	12.48	52
Linnett (A. L. R. Morkel)	2	115	73.78	310
Lone Hill (Day & Hallward)...	2	45	17.77	75
Shankuru (Harries & Anderson)... ...	2	183	165.96	697
Do. (tailings)	—	218	25.49	107
Vulcan (Vulcan Syndicate)..	2	350	29.82	125
Lomagundi Total			4,773.24	20,228
MAZOE DISTRICT—				
Goth B (Goth Synd.)	2	85	60.36	254
Hay G.M. Co., Ltd. 10	1T	2347	169.86	720
Do. (tailings)	—	2347	523.82	2221
Honest (G. Brown) (Jan. & Feb.) ...	3	238	67.90	285
Jumbo G.M. Co., Ltd.	30	3000	530.45	852
Do. (tailings)	—	1910	476.18	2024
Do. (slimes)	—	1060	149.35	635
Kitty tailings (J. Seton-Rogers)... ...	—	200	4.87	20
Lion and Lion DB (Assd. Mines of Rhodesia, Ltd.)	5	894	93.31	392
Do. (tailings)	—	420	40.72	171
Mickey (B. G. Byerley)	2	125	154.35	648
Night Adder (Night Adder G.M. Synd.)	2	127	17.13	72
Puff Adder (Puff Adder Synd.)	2	193	274.42	1153
Umkulu D.B. IW (Llaksram Synd.)	2	116	79.92	336
Mazoe Total			2,642.67	11,185
SALISBURY DISTRICT—				
Abercorn (J. Seton Rogers) January and February tailings	—	590	48.93	205
Gladstone A (L. Chiappini) tailings ...	—	700	42.43	178
Mont d'Or (Claxton and Bussell).. ...	2	96	115.73	486
Old Loyalty (Shamva Ilex G.M. Co., Ltd.)	5	860	278.67	874
Do. (tailings)	—	369	58.87	247
Salisbury Total			544.63	1,990
UMTALI DISTRICT—				
Bromley (Umtali Waterfall Synd.) tailings	—	131	13.59	57
Dim's Grand 1E (Carrick & Leslie).	5	207	49.57	208
Elgin (Umtali Waterfall Synd.)	(10)	180	46.20	194
Do. (tailings)	—	62	13.86	58
Do. (slimes)	—	100	9.18	39
Liverpool (Anderson & Snodgrass).. ...	5	640	103.02	433
Do. (tailings)	—	280	41.16	173
Penhalonga Mines, Ltd.	45	5700	457.58	1942
Do. (Concentrates)	—	120	504.90	2095
Perthshire D.B. (Sussex Synd.)	5	355	191.04	802
Do. (tailings)	—	250	29.34	123
Rezende Mines, Ltd.	35	3400	704.03	2987
Do. (tailings)	—	1993	321.95	1366
Do. (Concentrates)	—	60	266.49	1168
Rezende 1 W. A. (Imbeza Synd.).. ...	10	3468	255.44	1084
Do. (concentrates)	—	6	81.21	341
Selim D.B. (D. Tullough)	3	15	3.16	13
Umtali (Umtali Waterfall Synd.)... ...	10	905	318.49	1338
Do. (tailings)	—	848	96.41	405
Umtali Total			3,506.62	14,826

MASHONALAND TOTAL ... ... 22,903.18 ozs.

VALUE ... ... £96,439.

GRAND TOTAL ... ... 49,863.67 ozs.

VALUE ... ... £209,743.

SUMMARY.

Gold.—	Ozs.	Value.
Matabeleland	26,960,.49	113,304
Mashonaland	22,903.18	96,439
Total	49,863.67	£209,743
Silver	13,403.81 ozs.	£1,470
Chrome Iron	3,136 tons	7,000
Lead	46.22 tons	633
Wolframite	1.35 tons	100
Coal	17,530 ,, (sales)	6,036
TOTAL VALUE FEBRUARY OUTPUT		£224,982

CYANIDE of SODIUM, 120 %

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The South African Railways have accepted the following tenders: Sleepers—100,000 Jarrah, 6 ft. 6 in. by 9 in. by 4½ in., Millar's West Australian Hardwoods Co., Ltd., Capetown, 4s. 3½d. per sleeper; 61,000 Jarrah, 6 ft. 6 in. by 9 in. by 4½ in., Jac. Loopuyt, Capetown, 4s. 1d. per sleeper; 38,500 Jarrah, 5 ft. 6 in. by 7 in. by 4½ in., Jac. Loopuyt, Capetown, 2s. 10d. per sleeper; 17,000 Creosoted, 6 ft. 6 in. by 9 in. by 4½ in., Burt, Bolton and Haywood, London, 2s. 8½d. per sleeper. Bridgework,—Dorman, Long & Co., Middlesborough, £1,967 lot. Fencing material—1,188 lb. Steel Binding Wire, No. 16 S.W.G., A. Mosenthal and Co., Port Elizabeth, 12s. 6d. per 100 lb. net.; 35,442 lb. Galvanised Barbed Wire, 2 strand, 12½' S.W.G., Philip Bros., Port Elizabeth, 10s. 5d. per 100 lb. net; 25,740 lb. Galvanised Steel Fencing Wire, No. 6 S.W.G., Patlansky Bros., Port Elizabeth, 8s. 6d. per 100 lb. net; 22,770 lb. Galvanised Steel Lacing Wire, No. 8 S.W.G., Patlansky Bros., Port Elizabeth, 8s. 6d. per 100 lb. net; 53,955 lb. Galvanised Steel Fencing Wire, No. 8 S.W.G., Dreyfus and Co., Port Elizabeth, 8s. 6d. per 100 lb. net.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Randfontein Electrical Plant.

To the Editor, *South African Mining Journal.*

Sir,—In your issue of the 30th ultimo you print part of Mr. Butt's reply to the discussion on the paper he read before the South African Institution of Engineers on the electrification of the Randfontein Central. The part is that in which he refers to my criticism of a statement in his original paper. As Mr. Butt's reply closes the discussion so far as the South African Institution of Engineers is concerned, I should like to ask permission to offer in your columns a word of comment on his remarks. It is perhaps not necessary to do more than juxtapose Mr. Butt's original statement and one in his reply. In his original statement, reprinted on page 167 of your journal, he says, when speaking of the readings of an ammeter as an indication of torque: "Its indications cannot be relied on unless the power factor is known." In the reply, on page 169 of your journal, he says: "Every value of current will have a definite power factor." (Your excerpt omits the word "power," which is, of course, in the original.) I should like, however, to go a little further and point out the exact nature, in my opinion, of the confusion existing in Mr. Butt's mind. He appears to have taken my assertion that to any definite value of *current* corresponds one definite value of *torque* as being equivalent to its converse, viz., that to every definite value of *torque* corresponds one definite value of *current*, and then proceeds to show that this converse is not correct by saying that to "nearly every value of *torque* . . . . there are two values of *current*." I quite agree with him in the last statement, but it is not incompatible with my assertion, which is true, although its converse is not.—Yours, etc.,

H. P. HEATHER.

Johannesburg, April 1.

Industrial Dormice.

THE "WAITING GAME" CRITICISED.

To the Editor, *South African Mining Journal.*

Sir,—At this time of the year when a large number of South African mining companies hold their annual meetings, it is of considerable interest to note the number of concerns which have absolutely nothing to report save that the available cash balance at the end of last year was less than at the end of the preceding period. I could single out half a dozen such concerns from the reports of meetings contained in your last two issues. The directors, the auditors, and the secretaries continue to draw their fees, and of course they have no objection to the company continuing its existence until funds are exhausted and there is nothing more to be earned for the enormous labour of seeing that the beacons are not pulled down for the building of cow-sheds, and that a balance-sheet is printed once a year. I suppose the defence of the directors is that they, like Mr. Micawber, are waiting for something to turn up. Some of these concerns have been waiting for a decade and a half, and they will continue what the *South African Mining Journal* terms, in a stereotyped headline, "a waiting policy" until there are no more fees to be drawn. Why do not these industrial dormice go into liquidation and distribute their cash balances amongst shareholders? I suppose it is futile my writing to you on this matter, but possibly it will draw attention to what I regard as one of the scandals of South African mining. I have refrained from mentioning names, but anyone who takes the trouble to read the section of your paper which is headed "The Week's Company Meetings" for the last two issues will appreciate the truth and importance of this letter.—Yours, etc.,

PATIENCE EXHAUSTED.

[It is not possible, of course to reply adequately to our correspondent's vague generalities, but no doubt most of these companies can justify their continued existence by pointing to prospecting work in the neighbourhood of their properties, or promise of such improved conditions as may make their holdings increase in value with the efflux of time.—*Ed.*]

ANSWERS TO CORRESPONDENTS.

"J. M. H." (Rietvallei).—S. Fawn's "Tin Deposits of the World." To be had through the C.N.A.

"Scotty" (Germiston).—The shares are not quoted, and we have no means of knowing their value, if any. Better ask the secretary.

"Alphen."—Making enquiries.

Mr. G. D. Brown, till recently manager of French Bobs, Barberton, passed through Johannesburg at the week-end for Barberton to take up the managership of the Fortuna Mine owned by Messrs. Carlin and Chew. The latter were for years popularly identified with the Crown Reef and Crown Deep Mines as electrical and reduction officers respectively.

Perpetual motion and the transmutation of metals, those two eternal dreams of the inventor and scientist, appear to be much in the local atmosphere at present. We now learn of a venture which is said to have attracted a large amount of local capital, and which is to extract more gold from an ore than is called for by actual assay. We must infer from this that existing methods of assay are alleged to be erroneous, or else that the promoters have at last guessed the great riddle of the alchemist, and can transmute pyrites, or even mere earthy dross, into precious gold. It is furthermore reported that Sir William Ramsay and Sir William Crooks, together with two other famous scientists, are going to investigate the process without fee in the interest of metallurgy.

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Commissioner Street, JOHANNESBURG.

THE WEEK IN THE SHAREMARKET.

A Holiday Tone—Little Doing—Waiting on London.

The week, on the whole, has been disappointing, and the holiday spirit has, no doubt, restricted business. The market is now closed till Tuesday, and it is hoped by that time that the coal strike will have fizzled out and London will be sending some buying orders. Meanwhile, the legislative programme of the Government regarding the mining industry is not reassuring and certainly does not make for the confidence of investors. Native labour is still coming in well, and good values are reported from several of the deep levels, notably the Main Reef West and the southern section of the Consolidated Langlaagte. Randfonteins are weak locally, but are still being bought from London, and the March returns are awaited with interest.

	* Friday, 29th.	* Sat., 30th.	* Monday, 1st.	* Tuesday, 2nd.	Wed., 3rd.	Thurs. 4th.
African Farms ...	17 6	17 3B	17 0	17 0B	17 0	17 3B
Adair-Usher Process	1 6S	1 6S	1 6S	1 6S	2 0S	...
Aurora West ...	...	7 6B	7 6B	7 6B	7 6B	7 6B
Apex Mines ...	36 0B	35 0B	35 0B	..	40 0S	36 0B
Bantjes Consolidated	24 6B	24 9B	24 9	24 9B	25 0	24 9B
Benonis	6 3	6 2B	6 0B	6 3	6 2B	6 0B
Bushveld Tins ...	...	0 9B	0 9B	0 9S	0 9B	0 10B
Brakpan Mines ...	60 0B	61 0S	...	61 0	60 0B	60 0S
British S A. ...	29 6B	30 0S	...	29 6B	29 0B	29 0S
City and Suburban ...	49 3	49 9	50 0B	50 6B	50 6B	50 6B
City Deeps	53 9B	54 0S	54 0B	54 0B	55 6	56 6
Cloverfield Mines ...	5 3B	5 3B	5 3	5 2S	5 5S	5 3B
Cons. Langlaagtes ...	21 0B	21 3	20 9	20 9B	21 3	21 0B
Cons. Main Reefs ...	19 0	19 0	18 6S	18 9B	18 9	13 9B
Clydesdales	...	...	10 0B	...	10 0B	10 0B
Cinderella Cons. ...	19 6B	...	...	20 0S	...	..
Coronation Freeholds	0 7B	0 7B	0 7B	0 6S	...	0 6B
Con. Investment ...	...	...	...	22 6S	23 0S	23 0S
Concrete Cons. ...	11 0B	11 0B	11 0B	11 0B	11 0B	11 0B
East Rand Cent. ...	8 0S	8 0B	8 0B	8 3S	8 0B	8 0B
East Rand Coals ...	2 5	2 5B	2 5B	2 5B	2 5S	2 5B
East Rand Deeps ...	2 2S	2 1B	2 3B	2 4S	..	...
East Rand Props. ..	...	58 6B	60 0	62 3	64 6	63 9B
East Rand Deb. ...	£93	£95	£90	£93	£94	£94¼
Eastern Gold Mines	1 10B	1 11B	1 10B	2 0B	2 2	2 0S
Govt. Areas... ...	24 6	24 6B	24 6	24 6B	24 9B	25 0
Glencoe (Natal) Colls	6 0B	...	.	...	...	6 0B
Glynn's Lydenburgs	31 0B	31 0B	32 0S	31 9B	30 0	30 0S
Glencairns	5 0S	5 0B	5 0S	5 0S	5 0S	5 0S
General Minings ...	...	...	.	17 6B	...	18 0B
Ginsbergs	...	27 6B	28 0B	28 0B	28 0B	23 0S
Geduld Props. ...	...	22 3B	22 3B	22 0S	22 6B	21 0B
Jumpers	9 0S	...	9 0B	9 0B	9 6B	9 0B
Jupiters	11 0B	11 0B	11 3	11 0B	11 6	11 9
Kaalfontein Diamonds	0 6B	0 7B	0 9S	0 6B	0 6B	0 6B
Klerksdorp Props. ...	3 4	3 4	3 3B	3 2B	3 0B	3 4B
Knight Central ...	14 9B	15 0B	15 0	14 9B	14 9B	14 9B
Kleinfontein Estates	32 6S	...	...	...	...	...
Lace Props.	3 3S	3 5B	3 6	3 6B	3 6B	3 6B
Lydenburg Gold Farms	8 6B	8 7	8 7	8 6B	8 7B	8 7B
Main Reef Wests ...	28 0B	28 6	28 3B	28 6S	23 6B	27 6B
M.R. West Deben...	£101½	...	...	£100	£99	£98
Modder B's	53 9B	...	53 6B	54 6	53 9B	54 0B
Midas Deeps ...	1 2B	1 2S	1 2S	1 2B	1 2B	1 2B
Middelvlei Estates...	2 0B	...	2 0B	2 0B	2 1B	2 [illegible]
Modder Deeps ...	25 0B	25 0B	25 0B	25 6B	25 0S	25 6B
Meyer and Charltons	...	...	...	84 0B	84 0B	85 0B
Natal Nav. Colls ...	15 9S	...	...	14 9B	15 3B	...
New Eras	7 0B	7 0B	7 3	7 2	7 0B	7 0B
New Kleinfonteins...	30 0B	30 0B	30 0B	29 9B	...	30 0B
New Rietfonteins ...	11 0B	11 0	11 0B	11 0B	11 0B	..
New Unifieds ...	16 0B	...	16 0B	17 0B	17 0B	17 0B
New Boksburgs ...	1 9S	...	...	1 6B	1 6B	1 6B
Nigels	...	...	...	...	16 0B	...
Orange Diamonds ...	1 9B	1 9B	1 9B	1 9B	1 9B	1 9B

B Buyers. S Sellers.

	Friday, 29th.	Sat., 30th	Monday, 1st.	Tuesday, 2nd	Wed., 3rd	Thurs. 4th.
Pretoria Cement Co.	50 0B	50 0B	50 0B	50 0B	50 0B	...
Princess	11 6S	12 0S	12 0S	12 0B	12 0B	12 6B
Potchefstroom Est....	...	1 7B	1 6B	1 6B	1 6B	...
Paardekraal Estates	...	1 0S	1 0S	1 0S	...	...
Premiers Preferred	..	...	171 3	...	...	...
Rand Nucleus ..	3 5B	3 3B	3 3B	3 3B	3 3B	3 4
Randfontein Estates	34 0	33 6	31 0	31 6	31 6	32 9
Randfontein Deeps...	3 3B	4 0	3 9	3 9B	3 6B	3 6B
Rooiberg Minerals	30 0	30 6	30 3	30 0	30 9	30 6
Rand Collieries ..	7 6B	7 6B	7 0B	7 9B	7 6B	7 6S
Rand Klip	5 3B	5 3B	5 3B	5 3B	5 3B	5 3B
Ryan Nigels ..	4 0B	4 0B	...	..	4 0B	4 0S
Robinson Deeps ...	...	52 6B	...	52 6S	...	...
Rood. Durban Deeps	25 0S	25 6B	24 0B	28 0S	26 0B	...
Salisburys	3 0B	3 0	...	2 6B	2 6B	...
Simmer Deeps ...	5 0S	3 0S	...	4 0	3 9B	4 0B
South African Lands	4 8B	4 8	4 7	4 6B	4 7B	4 7B
S. Randfontein Deeps	...	4 6	4 0B	3 9S	3 10B	4 0
Sub Nigels	6 0B	6 0B	6 0S	6 0S	6 0B	6 0B
S. A. Breweries ...	39 0S	39 0B	39 0S	39 0B	39 0B	40 0S
Springs Mines ...	11 6B	11 9B	11 9B	...	11 9B	12 0B
Trans. G.M. Estates	44 6	41 0S	41 0B	...	42 6B	43 6
Temple Tins	3 3S	3 0S	3 0	...	2 9B	3 0S
Trans. Coal Trusts...	38 0B	38 0B	39 0S	39 0	39 0S	39 0B
Tudors	...	...	2 0S	...	...	...
Trans. Cons. Lands	32 6B	...	...	...	...	36 0B
Van Ryn Deeps ...	8 0S	8 0B	8 0B	8 0B	8 0B	8 0S
Village Deeps ...	41 6B	42 0B	41 6B	42 0B	42 6S	43 0B
Vogel. Cons. Deeps...	2 0S	1 9S	1 10S	2 0S	2 0S	1 6B
Witwatersrands ...	56 6B	54 6B	55 0B	57 0B	57 0B	57 0B
Wolhuters	21 6B	21 6B	...	...	21 6B	21 6B
Witbank Collieries...	...	41 0S	..	...	41 0S	..
Wit. Deeps	55 0	51 6B	54 0S	56 0B	54 0B	54 0B
West Rand Est. ...	3 0B	...	3 0S	3 0S	..	3 0B
Zaaiplaats	46 0B	43 0B	47 0B	47 6	47 6	47 0B

B Buyers. S Sellers.

New Patents.

123. Robert Hunter.—Self locking arrangement for set pins, tap bolts, and the like.
124. Edward George Clifford-Jones, Alfred Edward Barker, and Lancelot Ussher.—Apparatus for distributing material upon dumps.
125. Edward Silcock.—A hingeless gate.
126. Francis Laurence Bosqui.—Improvements in pulp distributors for amalgamating tables, plates, and the like.
127. John Scott.—Improvements in and relating to the hammer piston type of rock drill.
128. Raoul Diaz Wagner.—Improvements in screw bolts, buts, or the like for fixing rails on sleepers or for other purposes.
129. John Bourke Salmon and Ebenezer William Roy.—Improvements in and relating to pneumatic tyres.
130. Ernest William Massam and William McVitty.—Improvements in stamp guides.
131. Thomas Foulis, David Napier, and Samuel Fox.—Improvements in dust arrestors for rock drills.
132. William Friese Greene and Friese-Green Patents, Ltd. — Improvements in or relating to reproduction of animated pictures.
133. Percy John Bolt.—Improvements in apparatus for separating precious stones and precious or base metals from alluvial deposits.
134. Joseph Albert Hill.—Improvements in and relating to furnace grates for locomotive and other boilers and other purposes.
135. Hans Charles Behr.—Improvements relating to percussive apparatus.
136. David Taylor Guild.—Grooved bricks for use in securely holding plaster or rough caste harling.
137. Ivan Marcus Baikie.—Improved means for curing tobacco and the like.
138. Edward Brice Killen.—Improvement in or relating to rubber tyres and their attachment to wheels.
139. Thomas Henry Chad.—An apparatus for moulding igniters, or so-called "Tshisa" sticks, for blasting and other analogous purposes.
140. Jacob Morris and James Soutter.—The Rapid Billiard cushion.
141. Rowland Owen Pickin.—An improved device or tool for loosening and extracting rock-drills and the like from bore holes.

Engineering Notes and News.

Coming Big Orders.

Among the big orders for mining equipment likely to be placed soon, the most noteworthy are the reduction plant of the Shamva Mines (Rhodesia), the crushing plant for Leeuwpoort Tin Mines, plant for the Fairview (T.C.L.) Mine, and, probably, a new crushing plant for the Voorspoed Diamond Mine.

The Gas Engines Again.

The notorious Johannesburg Municipal Power Station gas engines have been repurchased by Messrs. Beardmore, and are now under option to a well-known South African financier. It is on the cards that they will figure in a new electrical power scheme at an early date.

A Big Railway Workshops Scheme.

The Metropolitan Railway Carriage Building Company, of Birmingham—a huge English corporation—has recently been making enquiries at different South African centres with a view to establishing an extensive branch of its works in this country. A representative of the company, Mr. Peyton, visited Bloemfontein a short time ago in connection with the matter, and it is understood that he is convinced that this is the most naturally suitable site for the proposed works. Mr. Peyton has also visited Durban and Cape Town in the course of his investigations. In February, Mr. C. L. Botha, M.L.A., heard of his presence in the country, and of his mission. Mr. Botha interviewed him, and outlined the advantages which Bloemfontein could offer, and put him into touch with the local municipality. After visiting Natal, Mr. Peyton came on to Bloemfontein and discussed the matter with the Mayor. He was received with the greatest cordiality and in a proper business spirit, and definite offers of a favourable nature were made to him on behalf of the Town Council—as regards a long lease of certain land at a purely nominal rental, cheap water and cheap electric light and power. If the works are established it is understood that they would be commenced on a huge scale, as it is said to be the object of the company not only to cater for the South African trade, but to make the branch a manufacturing and distributing centre for the markets throughout the Southern Hemisphere—for India, Australia, and South America. At the present time the Metropolitan Company does an enormous foreign and colonial business in railway and tramway carriages and fittings, and work of a similar nature. It is stated that the South African works would give employment to at least 1,000 men at the commencement, of whom about 400 would be artisans. It is believed that should the company establish a branch in this country the Government would be prepared greatly to reduce the scope of the present railway workshops, leaving most of the construction work to private enterprise, from which better prices would be forthcoming, and confining themselves almost entirely to ordinary repair and maintenance work.

The following tenders have been accepted for the supply of fertilizers to the horticultural division, experiment station, Warmbaths, viz. : South African Fertilizers Co.—Sulphate of potash, £11 10s. per ton; South African Fertilizers Co.—High grade superphosphate £4 per ton; South African Fertilizers Co.—Bone meal, £6 per ton; South African Fertilizers Co.—Nitrate of soda, £11 5s. per ton.

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Finance, Commerce, and Industries.

The Bank Amalgamation.

The Bank of Africa shareholders have ratified in London the agreement under which the National Bank of South Africa acquired the business and assets of the Bank of Africa. The National Bank proposes to increase its capital by the creation of 125,000 shares of £10 each, to enable them to carry out the deal, the purchase price being £1,250,000 cash. The National Bank will offer shareholders of the Bank of Africa an opportunity of subscribing for these new shares at par. Any shares not so taken will be offered to the shareholders of the National Bank. The basis of the amalgamation will be the exchange of 25 National Bank shares, of which £10 has been paid, for 32 Bank of Africa shares, of which £6 5s. has been paid.

* * * *

Natal Wattle and Tea.

According to the report of the Durban Chamber of Commerce, the year 1911 registered a further step in the production, which has been expanding year after year. In 1908 the exports were only 25,000 tons, of the value of £173,500, and in 1911 nearly 50,000 tons, of the value of £288,364. The profitable nature of wattle-growing in Natal appears to be attracting attention from abroad. During the year a strong English company purchased and leased a large tract of land, about 30 miles from Durban. Some hundreds of acres of wattles of various ages were already on the land, and several thousands of acres will be ploughed and planted before the close of 1912. During the latter part of 1911 shipments to Australia increased, and there are indications that the demand from that quarter for 1912 will be on a much larger scale than hitherto. The tea industry of Natal has pursued the even tenor of its ways during the past season, 1911 to 1912, and it may be expected that by the end of May, when the picking for the year generally closes, the output will be much about the same as that of the previous season, although it was most unsatisfactory to report that the industry is not extending, and the Indian labour difficulty is undoubtedly the chief reason of the arrested progress. The prices of tea were raised at the beginning of the year 1911, in consequence of the greatly advanced price of labour, and the quality and manufacture have never been better than at present. It is estimated that 6,000 acres are now in full bearing, the same as last year, and that the output of the Province for 1911 was 2,100,000 lbs. of manufactured tea.

* * * *

Railways and Harbours.

The report of the Railways and Harbours Board, tabled by Mr. Sauer in the Assembly, comprises 16 pages, chiefly tabular matter, and deals with the year 1911. The following figures are from the summary of results of the year's working (the corresponding figures for 1910 are given in parentheses):—Total expenditure on capital account, £77,576,357 (£75,100,228). Mileage open at December 31: 3ft. 6in. gauge, 7,106 (6,661); 2ft. gauge, 442 (380). Train mileage, 25,521,713 (23,580,646). Passengers carried (journeys), 37,165,697 (33,700,849). Tonnage (revenue-earning), 11,080,075 (10,708,737). Earnings: Coaching, £3,384,862 (£3,090,104); goods and coal, £7,950,504 (£8,291,525)—making, with live stock and other traffic receipts, etc., the total earnings £12,163,841 (£12,056,871). Total expenditure (excluding renewals), £6,230,685 (£5,857,250). Renewals, £1,024,148 (£740,661). Surplus of earnings over working expenditure and renewals, £4,909,008 (£5,458,960). Percentage of gross profit on capital account entitled to interest, £6 13s. 11d. (£7 12s. 3d.). Total staff, 49,456 (49,762). The report comments on the increase of coaching receipts, notwithstanding the reduction in fares. The question of additional appliances to cope with the expansion of coal exports from Durban is engaging the attention of the Board. The Treasury (states the report) has obtained legal advice to the effect that, according to the interpretation of the Act of Union, the railways are liable for the interest on the full amount expended on railways and harbours, viz., £86,252,960. The Board, on the other hand, also obtained legal advice which, if given effect to, will appreciably reduce the amount of interest payable to the Treasury. The amount on which the Board submits it is only justified in paying interest is £73,238,774. The difference between these amounts at 3½ per cent. would mean a loss to the railway revenue of £455,496 per annum in perpetuity. The report remarks: The decision of the question has an important bearing upon fares and rates, which will soon come under review, and the Board hopes to have an early expression of the wishes of Parliament on the matter. Reductions in the amounts provided for depreciation were made in the years 1910-1911 and 1911-1912 amounting to £870,401, in order to meet the Treasury's requirements; but the Board expressed the opinion that it is inadvisable to curtail the annual payments to this fund, especially in view of the inadequate provision in the past. The Board contemplates a further provision of rolling stock amounting to £450,000. Some of this rolling stock, owing to the urgency of the traffic requirements, has had to be ordered from abroad; but it is nevertheless the Board's policy to cause as much as possible to be supplied by the railway workshops within the Union. The amount of revenue surrendered by assimilation and reduction of railway fares and rates since Union is approximately £586,500 per annum. The percentage of trade to the Transvaal competitive area by the Lourenco Marques route has now come within the limits provided by the Convention in the classes embodied in Group 1, which represents the heaviest tonnage and the highest rates; but the tonnage coming by the Lourenco Marques route in Group 2 is still considerably in excess of the percentage to which that route is entitled. A further reduction, however, in the rates for Group 2 came into force on the 1st inst. The whole question of establishing uniformity of practice and of charges at the ports is receiving careful attention, and much data has been collected in the 20 months since the establishment of Union. Increases in salaries and wages of white employees have been granted as follows:—Salaried staff 4,516, amounting to £61,556; daily-paid staff 21,961, amounting to £264,886. The Commissioners draw attention to the importance of good roads connecting with the railway system, and especially in view of any fresh proposals for new lines, so that provision may be made by the proper authorities for making the necessary roads simultaneously with the laying down of the railways.

Liquidation Meetings.

Standard Oil Co. of South Africa, Ltd., The; final meeting of shareholders will be held at 86 and 86a Standard Bank Chambers, on April 22nd. D. Healy, liquidator.

Union Diamond Mines, Ltd.: first and final liquidation account and plan of distribution will lie concurrently at the Master's office, Pretoria, and A.M.'s office, Johannesburg, for fourteen days from March 23rd. Alexander Rodger, liquidator.

Union Coal Co., Ltd. (voluntary), March 14th; a meeting will be held at 17-19 Robinson Buildings, Commissioner Street, Johannesburg, on April 2nd; claims to be filed with and debts to be paid to J. A. Barbour, liquidator, within twenty-one days from March 19th.

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ADVERTISEMENT RATES ON APPLICATION

Automobile Notes.

The Forthcoming Show.

Not the least attractive feature of next week's show will be the display of automobiles and accessories, under the auspices of the South African Society of Motor Traders. The invitation of the Agricultural Society for the motor traders to occupy a certain section of their exhibition space has met with a ready response, in very practical form, thereby assuring the success of the undertaking in regard to things automobile. Chief among the exhibitors are:—The Rand Garage and Motor Works, D. H. Saker and Co., Anglo-French Garage, Johannesburg Motor Mart, Ltd., Connock's (S.A.) Garage, Ltd., H. Gill and Co., B. J. Penny, etc. The Dunlop Pneumatic Tyre Co., Ltd., and the Continental Tyre Co., will be responsible for the tyres on exhibit, which by way of practical demonstration will be fitted to the various vehicles being shown. The Vacuum Oil Co. of South Africa, Ltd., and the Texas Co. (S.A.), Ltd., are displaying the commodities in which they specialise, viz.: lubricants of various kinds, petrol, etc. The cars on exhibit, being 1912 models, may be safely considered as the "last word" in automobile construction. Embodying every latest improvement in design and finish calculated to tempt the most fastidious buyers.

It may be interesting just here to refer to the import trade returns, recently published, for the two first months of 1912, which show the value, for that period, of imported motor cars and parts to the Union of South Africa, as £76,336, appreciable figures, which reflect the steady progress being maintained in the automobile business. But to return to the exhibition. Its success was not once questioned by the promoters, provided combined support from the different traders could be relied upon. This, to a large extent, has been secured, and the anticipated issues of the experiment will therefore materialise. A detailed account of the various exhibits will appear in the next issue of this journal. It may be added that a separate motor exhibition is under contemplation, the S.A.S.M.T. being assisted in the scheme which is mooted by other interested automobile associations. The date of such an exhibition, in all probability, will be so arranged as to permit sufficient time to elapse for the very latest models to arrive in this country, following on the conclusion of the great Olympia Show, in London. The idea is certainly one which should commend itself to all motor traders and agents, who, to ensure success, must arrange for the co-operation of the manufacturers, as by such assistance alone can an exhibition of the required nature be attempted.

Rains Interfering with T.A.C. Run.

It is just possible that the competition for the Lezard Shield, referred to in a recent issue, to Warmbaths and return, arranged for the 7th and 8th inst., may be postponed, owing to the recent torrential rains which have been experienced in those districts of the Transvaal, north of Johannesburg, through which the route lies. The weather conditions prevailing at the Easter season are invariably favourable to motor racing, and much disappointment will be experienced if their present adverse nature necessitates a postponement of the first event of the club season. There has been no lack of entries, considering that the contest is confined to amateur members of the Transvaal Automobile Club. Given propitious weather, however, the competition will be carried out under the conditions already published.

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Advertising South Africa.

Most people are aware of the attempt being made to advertise South Africa, on an extensive scale, and the new official policy and methods to be employed by the Union Railways are of more than passing interest to those who view the future of the country impartially, and it is hoped that the high ideal aimed at may be in the main achieved. These columns being set apart for articles bearing chiefly on motor topics, scarce permits reference to the great industrial resources of the country, which could be discussed from standpoints inexhaustible, but one point is clear to every motorist, namely, that the first great step towards the attraction attempted is possible by a better system of roadways than exists. Some, of course, may argue that other undertakings are of paramount importance to the development of this part of the Empire, but it is not intended to enter the field of discussion here, beyond saying that, having in view the attraction of the settler and the tourist, much more definite attention must be focussed on the ways and means of linking up the various commercial and industrial centres of the Union, and bringing into touch with these centres of control the outlying and remote districts, which alone will be rendered possible by a perfect system of roadways. Not so long ago a reference was made to the possibility of a main road from Johannesburg to the coast, and it will also be remembered that a measure for its provision, freely discussed during election times, was ear-marked for presentation to the Legislature. How far the promises, made during the fever of the elections, have even been remembered is not apparent, but no issues of a practical nature have evolved. It is, however, gratifying to reflect that this great question is by no means shelved, as the following contents of a circular letter widely distributed will prove. The letter emanates from a gentleman in an official capacity in Natal, and throws a significant light on the importance of this main road, as seen through the coast glasses. It reads:—" The beauty of Natal's scenery, and its historical interest, combined with the natural advantages of Durban as a seaside resort for the winter months, have, during recent years, become so favourably known to the general public of South Africa as well as to Oversea tourists, that the increasing number of visitors has contributed in no small degree to the general prosperity of the Province. The feeling has arisen in the minds of many Natalians that, in order to maintain the popularity of the 'Garden Colony,' and provide for the exigencies of modern times, the improved construction of the main roads is necessary, more particularly the main trunk road from the Transvaal to Durban and the South Coast. In response to a general request I am convening a public meeting in the Council Chamber (by kind permission of His Worship the Mayor of Durban) for the purpose of forming a Natal Main Roads Improvement and Tourists' Association. Knowing your enthusiasm for the advancement of this Province, your name suggests itself to me as a likely member of the committee," etc., etc.

One must conclude on a perusal of this persuasive letter that the advisability of the scheme of a great main road from the coast to Johannesburg is becoming patent to the dwellers at the former place, who evidently recognise an increased prosperity, as by no means the least of the benefits resultant, were the scheme to assume practical shape.

Oil Prices Rising.

Owing to the immense reduction in transport brought about by the great strike, and the consequent shortage in supplies of oil, a general increase in the price of that commodity is being experienced in England and on the Continent. Up to the present, however, the strike movement has not materially affected the prices obtaining for oil in Johannesburg, though mail advices to hand may contain information which may lead to a slight increase in the price of that article. One aspect of the case arouses a fear that the present industrial crisis may entail an advance in prices, as owing to the immense quantities of oil being consumed for fuel purposes, and requisitioned for in other ways as a substitute for coal, a decided shortage must of necessity bring about an advance in price. Apart from strike influences altogether, there has been recently a marked universal tendency to increase the price of oils, for which various reasons have been adduced; but it is practically safe to assert that an immediate advance will characterise the present prices obtaining locally.

Our Twenty-First Anniversary Number.

THE LAST WORD ON RAND MINING.

To commemorate the twenty-first anniversary of the founding of this journal, a special number, distinct from the ordinary weekly issue, will be issued in June next. Fittingly to mark the occasion, the number will contain a comprehensive and concise account of the past history, achievements and present position of every gold mine on the Rand, illustrated and brought down to the latest possible date. It will review the industry generally as well as in its several technical aspects, and will include articles by experts on the chemical, mining and metallurgical progress and problems of the fields. A feature will be made of the personal side of the industry, and a section will be devoted to its technical and administrative leaders, enriched with portraits and other illustrations. Engineering on the Rand in all its phases, electricity, steam and air power will be treated, and the growth and progress of electric power supply will be exhaustively discussed. The gold mines of the outside districts and the tin, copper and coal industries of those districts will be dealt with thoroughly and at first hand. The great diamond industry of South Africa will have a section to itself, and here, as in the treatment of the base metal industries, the letterpress will be embellished with many striking and original illustrations. Mining in the Cape, Natal and Orange Free State Provinces will also be reviewed and the undoubtedly great mineral potentialities of those, as yet undeveloped, areas will be graphically set forth. German South-West Africa will find a place in the issue and a first-hand account of the diamonds, the copper and the tin mines of that promising field will be included. Moreover, the banks and other great financial institutions, the railways and harbours of the sub-continent will be adequately dealt with, and the whole problem of transportation as it affects the inland industrial centres will be reviewed. In this connection Capetown, Port Elizabeth, Durban, East London, Delagoa Bay and Beira will be separately and fully treated and their claims examined. Apart from mining, there will be a considerable section devoted to a description of the several subsidiary industries dependent on mining for a market. Chief among these will be cement, explosives, soap and candle-making, milling and the hundred and one activities that centre in the Rand. Rhodesia and Mozambique will be given a separate and extended treatment. The different mines will be described and illustrated, and the recent progress of the industry in those territories dealt with comprehensively and lucidly. In addition, the issue will contain a number of interesting and valuable contributions from leading men in the mining and financial world, many of whom have already sent their congratulations on the decision to issue a special commemorative number of the journal. Numerous letters received from past Rand engineers and mine managers, now resident in all parts of the world, contain offer of contributions. These will form a unique collection of valuable views and reminiscences, and will considerably enhance the interest of the volume. The work will consist of upwards of 350 pages, printed throughout on art paper. Prizes are offered to artists for the best design of a suitable and striking character, and particulars are given in another part of this issue of other valuable prizes to be awarded in connection with the number. It may be added that the work will be prepared, produced and printed in South Africa, and will aim to cover the whole field of mining in this country, and to prove a fitting monument to the great industry with which, from the beginning, the *South African Mining Journal* has been associated. The co-operation of everyone interested in the industry is being enlisted to make the venture a success, and already it promises to mark an advance on anything of its kind ever before attempted in South African illustrated journalism.

The whaling industry of Natal, since its inception in 1908, has made very considerable progress, as can be seen from a comparison of the number of whales landed at the Bluff during the last three years: 1911, 1,015; 1910, 531; 1909, 155. The factories at the Bluff being well equipped, have been able to handle this large number of whales, and during last season the output has been, in round figures, 7,500 tons of oil, 3,000 tons of fertiliser, and 60 tons of finners, the value thereof being approximately £145,000.

The Week's Company Meetings.

SIMMER DEEP.

Increased Efficiency.

Reduction of Working Costs.

The fifth ordinary general meeting of shareholders of the Simmer Deep, Ltd., was held in the board-room, Consolidated Goldfields Buildings, last week. Mr. D. Christopherson presided, and there were also present Messrs. F. Leslie Brown, J. E. Kent, H. H. Oldroyd, D. W. Rossiter, W. S. Smits, A. E. Cowley, A. Ewer, A. Sprinz, J. Jourdaan, J. D. Low (secretary), representing 604,208 shares out of an issue of 1,650,000.

The Chairman, in moving the adoption of the report and accounts, reviewed the financial position. He stated that a working profit was made of £56.783, equal to 2s. 1d. per ton crushed. The ore reserves at the end of the financial year were estimated at 1,312,000 tons of a milling value of 4.9 dwts. The labour supply during the year has not been satisfactory, the mine having operated with an average of 65 less natives than in 1910, but notwithstanding this the manager was able to mine 101.000 tons more, owing largely to the use of small machines. Owing to improved supervision and the application of knowledge gained from experience both in the compound and underground there has been an appreciable decrease in the number of natives "off work" on account of sickness, the native hospital shifts having been reduced from 41,718 for the first six months of 1911 to 21,330 for the last six months of that year. The close detailed attention which the management and Dr. Watt and his medical staff have combined to give towards improving health conditions both on the surface and underground has materially assisted the operations of the mine.

EFFICIENCY AND COSTS.

The question of low working costs on these deep level mines is largely dependent on health conditions underground, and this has been to a large extent proved from the fact that since the ventilation plant was installed last July efficiency has improved and working costs have been reduced.

In his report Mr. Leslie, who, together with his assistant, Mr. Craig, and Mr. Macgregor, the manager, has closely studied the position since the end of the financial year in order to bring his report up to as late a date as possible, states that from the information at present available they should not expect a recovery of more than approximately 18s. per ton. In these circumstances an increase in the profits in the future must depend on reduced working costs. It would appear that the future of the company must depend chiefly on being able either to obtain more native labour or to introduce further mechanical devices to replace it. As far as can be estimated to-day the financial resources of the company are such that all debenture obligations can be met for the next two years, and it is reasonable to hope that within that period progress will be made towards the solution of these questions and the consequent attainment of increased profits.

IMPROVED VENTILATION.

During the year they had continued to meet with considerable success in popularising the mine with natives, no doubt largely owing to the improved conditions underground as regards ventilation. But it seems they must make up their minds that if they are to have any real security for the mines being worked at their full capacity they must depend on and undertake wherever possible the replacement of native labour by mechanical devices.

It is stated, and with considerable reason, that small drills of the hammer type may compete with hammer boys both as regards stoping widths and costs. One or two companies under the management of the Gold Fields have been experimenting with these drills for some time with satisfactory results. If success can be obtained with this class of drill and its adoption becomes more general along the Witwatersrand a very large number of natives now employed on hammer work would become available for other mine work and so reduce the prejudicial effects of the present shortage. Most gratifying efforts are being made on this and other mines of the Consolidated Gold Fields Group to effect the mechanical replacement of native labour in branches of work other than drilling, and the technical staff of the Consolidated Gold Fields are specialising in order to give all possible assistance in this direction.

The very existence of these low grade mines depends on low working costs, and these can only be attained by the most rigid economy and the co-operation of all concerned including the sympathy and help of our Government. The Simmer Deep ore appears to be typical of enormous low grade tonnages existent in unexploited deep level areas of the Witwatersrand and we can fairly claim such co-operation and help to demonstrate as soon as possible that such areas can be worked at a profit to the great advantage of the whole community. He said the report of Mr. Leslie, the superintending engineer, deals with the policy followed during the year as regards mining, and it will be seen that the ore reserves being drawn on have not exceeded in grade the average of the ore reserves as disclosed. This policy is being followed closely in order that what is being done to-day can be continued in the future provided no depreciation is disclosed in the value of future development and no detrimental influence is brought to bear on costs. No doubt profits might be improved temporarily by encroaching somewhat on the average value of the reserve, but if this were done it would only be a matter of time before disaster followed. The decreased costs and increased payable tonnage per foot of development advanced are distinctly favourable indications that the important question of economical development is being closely studied. Some time must elapse before a series of drives and connections for stoping are advanced to the western extremity of the mine, where it is hoped to encounter favourable values approximating those of the eastern section of the Jupiter mine approaching the Simmer Deep-Jupiter boundary, but development work is being pushed with all speed in this direction.

PROFITS IN THE FUTURE.

As regards the future, I would have you to remember that any remarks I can make must be based on conditions as they prevail to-day. In his report, Mr. Leslie, who, together with his assistant, Mr. Craig, and Mr. Macgregor, the manager, has closely studied the position since the end of the financial year in order to bring his report up to as late a date as possible, states that from the information at present available we should not expect a recovery of more than approximately 18s. per ton. In these circumstances, an increase in the profits in the future must depend on reduced working costs. As Mr. Leslie points out, there is reason to think that we could realise an improved profit per ton from reduced costs if the mine could raise the tonnage to the capacity for which the existing lay-out of the mine, its plant and equipment are designed, and it would naturally follow there would be the extra profit from the increased tonnage. The underground position is to-day forward enough as regards development to supply the full amount of tonnage required if labour were sufficient to obtain it. Therefore, it would appear that the future of your company must depend chiefly on our being able either to obtain more native labour or to introduce further mechanical devices to replace it.

DEBENTURE OBLIGATIONS.

As far as can be estimated to-day, the financial resources of the company are such that all debenture obligations can be met for the next two years, and it is reasonable to hope that within that period progress will be made towards the solution of these questions and the consequent attainment of increased profits. During the year we have continued to meet with considerable success in popularising your mine with natives, no doubt largely owing to the improved conditions underground as regards ventilation, and I think there is reason to believe that we shall be able to maintain our present supply of natives and possibly increase it, but it seems to me we must make up our minds that if we are to have any real security for our mines being worked at their full capacity we must depend upon and undertake wherever possible the replacement of native labour by mechanical devices.

SMALL DRILLS.

It is stated, and with considerable reason, that small drills of the hammer type may compete with hammerboys both as regards stoping widths and costs. I say "with considerable reason" because one or two companies under the management of the Gold Fields have been experimenting with these drills for some time with satisfactory results. If we can obtain assured success with this class of drill and its adoption becomes more general along the Witwatersrand, a very large number of natives now employed on hammer work would become available for other mine work and so reduce the prejudicial effects of the present shortage. Most gratifying efforts are being made on this and other mines of the Consolidated Gold Fields group to effect the mechanical replacement of native labour in branches of work other than drilling, and the technical staff of the Consolidated Gold Fields are specialising in order to give all possible assistance in this direction.

LOW GRADE DEEP LEVELS.

In conclusion, gentlemen, I would emphasise the fact that your engineer and manager are dealing with a property which is expected to return under present conditions and unless working costs are further reduced, not more than 2s. per ton profit. When you consider that a drop in value of the ore sent to the mill of three grains of gold on a tonnage of, say, 50,000 tons per month, means a drop in profits from £5,000 to approximately £3,750, you will readily understand that the profits must vary from month to month, as, even putting aside the question of such a small drop in the value of the ore sent to the mill, your working costs are bound to vary to some extent through causes beyond the control of your manager. Your manager, as on other low grade deep level mines, can only obtain a profit by practising the most rigid economy. He has not the margin which his richer neighbours have by reason of their being able to work higher grade ore. The very existence of these low grade mines depends on low working costs, and these can only be attained, as I have said before, by the most rigid economy and the co-operation of all concerned including the sympathy and help of our Government. The Simmer Deep ore appears to be typical of enormous low grade tonnages existent in unexploited deep level areas of the Witwatersrand, and we can fairly claim such co-operation and help to enable us to demonstrate as soon as possible that such areas can be worked at a profit to the great advantage of the whole community. Before concluding, I must mention that a shareholder has written to me to ask that the question of the importation of white or coloured labour should be raised at this meeting. I do not think that any good purpose would be served by raising such a vexed question on an occasion such as this. Let us rather devote our attention to the encouragement of the efforts to which I have referred to solve or, at any rate, alleviate our difficulties by the increased substitution of mechanical appliances for unskilled labour.

THE MANAGEMENT.

Before moving the adoption of the report, I should like to refer to the continuous energy which your manager, Mr. Macgregor, has shown during the year under review. The working of a low grade proposition such as the Simmer Deep requires constant personal attention to every detail, and consequently there is a continual strain on the manager and his staff, and to these gentlemen our thanks are due for the manner in which they performed their duties in spite of great difficulties during the past year.

The retiring directors, Messrs. H. O'K. Webber and W. S. Smits, were re-elected.

Mr. Thomas Douglas and Mr. Charles Stuart were appointed auditors.

JUPITER G. M. COMPANY.

Shortage of Native Labour.

Improving Outlook.

The twelfth ordinary general meeting of shareholders of the Jupiter Gold Mining Company, Ltd., was held last week in the Consolidated Gold Fields Buildings. Mr. D. Christopherson presided, and there were also present Messrs. W. E. Eastwood, J. E. Kent, D. W. Rosseiter, W. S. Smits, M. Honnett, F. Leslie Brown, H. Eckstein, and J. D. Low, secretary, representing 263,687 shares out of an issue of 1,014,200.

The Chairman, in moving the adoption of the report and accounts, pointed out that the working profit for the year amounted to £32,879, which, after writing off a special item of £5,941, showed a reduction of £13,726, as compared with the previous year. The mine incurred during the year considerable expense owing to the introduction of small machine drills to replace hammer boys, which expense was charged to working costs In addition to this the development footage was 11,349 feet, as compared with 7,702 in 1910, the average charged to working costs for development in 1911 being 3s. 0.9d. per ton crushed, as compared with 2s. 10.7d. for 1910. The working costs for the year amounted to 20s. 8.8d. per ton, excluding renewals and replacement of plant, which amounted to another 4.5d. Since the close of the financial year the working costs have been somewhat reduced, the figures being for January 18s. .342d. and February 18s. 3.477d. Extensive construction work has been done on both the Howard and Catlin shafts, largely with a view to handling both men and rock in a more expeditious way.

SMALL ROCK DRILLS.

During the year the manager has been driven through scarcity of native labour to give much attention to the introduction of small rock drills, chiefly of the hammer type, and with such encouraging results in face of initial difficulties that authorisation has been given for the erection of a further 50 drill air compressor. At the end of December, 1910, there were 66 rock drills in use on this mine, while at the end of December, 1911, this figure had risen to 166, which will probably again be largely increased during the present financial year. It appears probable that with improvements in the manufacture of machine drills in direction of reduced power consumption, cheaper power, and with the greater skill with which in course of time it is reasonable to expect they will be operated, machine drills will become part of a series of important means of counteracting native labour deficiency in the future of Rand mining.

MINERS' PHTHISIS.

Concurrently with the increase of rock drills the engineers and manager have co-operated with Dr. Watt, the mine medical adviser, and his staff, together with the Consolidated Gold Fields Laboratory staff, in a determined effort to reduce to a minimum the spread of miners' phthisis, and towards this end an organised system of dust allaying and equalising of underground ventilation is being carried out. It is hoped that the endeavours of the management in this direction will have the earnest support of the underground workmen on whose behalf they are chiefly made. The shortage of native labour has again seriously interfered with the operations of the company, and for this reason only 60 per cent. of the capacity of your plant can be made use of. Before the full capacity of the plant can be employed there must either be an increase in the native labour force or in mechanical improvements found to replace such labour. It must be chiefly to the second alternative that they must look for security of working continuously at full capacity. It is not sufficient merely to supersede the hamber boy by means of machine drills, and close attention is being given on this mine and other mines of the Consolidated Gold Fields Group to effect the mechanical replacement of native labour in other branches of work, and the technical staff of the Consolidated Gold Fields is specialising to give assistance in this direction.

The report and accounts were adopted.

Messrs. E. A. Wallers and C. Distel, retiring directors, were re-elected, and Mr. Charles Stuart, Mr. Thomas Douglas and Mr. Ball were appointed auditors.

RANDFONTEIN DEEP.

The ninth ordinary general meeting of shareholders in the Randfontein Deep, Ltd., was held in the boardroom, Consolidated Buildings, last week, Mr. John Munro presiding. Among those present were Messrs. P. Richardson, G. Sonn, H. A. de Beer (representing the Transvaal and Rhodesian Estates), O. Schuurman, M. J. Elkan, H. Neuhaus, A. G. Gill, J. F. Rutherford and F. Hall (representing the secretaries).

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: I beg to submit for your consideration the directors' report and audited accounts for the twelve months ended the 31st of December, 1911, also reports from your consulting engineer and mine manager, which cover the same period. In dealing with the balance sheet you will notice that capital expenditure amounting to £69.527 1s. 4d. was incurred during the year, of which amount £61.752 19s. 7d. was spent in connection with shaft sinking and equipment. The general expenditure was £14.231 19s 6d., while £4.929 8s 6d. was received for rents, interest, etc. The cash in hand at the end of the year amounted to £68.970 2s. 11d. At the meeting of shareholders held in March of last year I advised you that the directors had decided to close down one of the shafts, as the funds in hand were not sufficient to carry both shafts to the reef. It was decided that the south shaft, which had attained a depth of 1,650 feet, should be closed down, and all work concentrated on the north shaft. On reference to the annexure to the manager's report, you will see that the cost of shaft-sinking has steadily increased since April last when it was found necessary to instal a more powerful pumping plant in consequence of the ever-increasing flow of water in the shaft. Bearing in mind that the available cash would not be sufficient to sink the shaft to a point where it was anticipated the reef would be struck, and as the time was inopportune to raise further working capital, your directors, after consultation with the principal shareholders, decided in February of this year that all operations should be suspended on the property. Sinking in the north shaft was therefore discontinued at a depth of 2,083 feet. Both shafts have been left in such a condition that when it is decided to resume shaft sinking there will not be the slightest difficulty in restarting operations. In the meantime the property is placed under the charge of a caretaker. I need hardly say it is a matter for great regret that we were compelled to take this step, but it was felt that it would be better to conserve the cash then in hand, and wait for a more favourable opportunity for raising fresh capital. Before sitting down I wish to express the deep regret which my colleagues and myself experienced in the death of your late chairman, Mr. Harold F. Strange.

The report and accounts were adopted.

The election of Mr. Gustav Imroth as a director in place of the late Mr. Harold F. Strange was confirmed, and Messrs. C. S. Goldmann and Max G. Elkan were re-elected to the board.

Messrs. Henry Hains and F. W. Diamond were reappointed auditors.

In reply to questions from Mr. Sonn the chairman said when they closed down they had a cash surplus of £47,145. As to what it would cost to get to the reef in the shaft mentioned by Mr. Sonn, it would be extremely difficult to form any conclusion because the deeper they went the more rapidly in volume the water increased, and the cost of pumping was very great.

Before Mr. A. H. Samuel in C Court to-day George William Paddon was charged on remand with contravening Act 15 of 1911, in that, it was alleged, he did act as a labour agent not being the holder of a duly authorised licence to recruit natives for the purpose of being employed in work or labour in Pretoria within the Union of South Africa. No evidence was led and the case was remanded till Tuesday, the next, the 2nd of April.

Contracts Open.

The General Officer Commanding the Troops, Potchefstroom District, Cantonments, Potchefstroom, invites tenders for the supply of mealies and mealie-meal at Potchefstroom for a period of 12 months from 1st July, 1912, to 30th June, 1913 (May 2).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for bookbinding for a period of three years, from July 1, 1912, to June 30, 1915 (the nature of the work necessitates its performance in Capetown) (May 1); also for the purchase of 16 typewriters, nine assorted typewriter covers, and one rotary neostyle, which may be inspected at the Government Stationery Stores, 87 Castle Street, Capetown (April 24); also for the supply of mealie-meal to Forest Department, Orange Free State Conservancy (April 24).

The Chairman, Transvaal Provincial Tender Board, Box 1240, Pretoria, invites alternative tenders for the erection of the undermentioned schools and quarters in the Transvaal Province, in (a) local brick, and (b) in wood and iron brick-lined:—School for 48 pupils and teachers' quarters at Athalie; school for 18 pupils and teacher's quarters at Grootvallei No. 153; school for 48 pupils at Vlakpoort No. 232; teachers' quarters at Zoetendalsvlei No. 221; school for 64 pupils and teachers' quarters at Welbedacht No. 40; school for 48 pupils only at Ploegschaar No. 71; teachers' quarters' only at Platrand No. 196; school for 64 pupils only at Langzeekoegaat No. 23; school for 48 pupils and teachers' quarters at Goedgedacht No. 185; teachers' quarters only at Vischgat No. 318; school for 80 pupils and teachers' quarters at Honignestkrantz No. 121; school for 64 pupils and teachers' quarters at Klipdrift No. 123; school for 80 pupils only at Hartebeestspruit No. 572; teachers' quarters (two) at Cullinan; school for 48 pupils and teachers' quarters at Rietfontein No. 288; school for 64 pupils and teachers' quarters at Knopfontein No. 1054; school for 48 pupils and teachers' quarters at Rhenosterpoort No. 2145; school for 80 pupils and teachers' quarters at Wakkerstroom No. 790; teachers' quarters only at Zoekmakaar No. 189; school for 64 pupils and teachers' quarters at Boschmanskranz No. 156; school for 100 pupils and teachers' quarters at Driefontein No. 2[illegible] teachers' quarters only at Tweefontein No. 236; teachers' quarters only at Tonteldoos; teachers' quarters only at Leeuwfontein No. 316; school for 48 pupils and teachers' quarters at Boschfontein No 1064; teachers' quarters only at Valliespruit No. 464; school for 64 pupils and teachers' quarters at Lake Chrissie; school for 64 pupils at Amsterdam; school for 64 pupils and teachers' quarters at Winkelhaak No. 73; school for 80 pupils and teachers' quarters at Mahemsvlei No. 539 (April 26).

The Municipality of Bethlehem invite tenders for the supply and delivery of 7,300 feet steel piping and specials for waterworks extensions (piping 6in. and 4in) (April 12).

The Municipal Council of Johannesburg invites tenders for the supply and erection of steel water tank and substructure at Market Buildings, Newtown, Johannesburg (April 12).

The Secretary to the Tender Board, Attorney-General's Office, Pietermaritzburg, invites tenders for the erection of bridge over Upper Ingagane River (April 15); also for the supply and erection of superstructure for Batje Spruit bridge, Nqutu Division, Vryheid (April 10).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the erection of new nurses' home at Pietermaritzburg Asylum (April 17).

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Notes and News.

Eileen Alannah. The Eileen Alannah, whose statutory meeting was held recently, and a report of which appears in another column, has struck a new chute of ore. Mr. Ackermann, the engineer of the British South Africa Company, regards it as a very important development, for from the point of intersection it has been driven on for a distance of 60 feet, the average value being 11 dwts. Work is now in progress to cut the chute at the fourth level, and if it is found to reach this depth there will be a large tonnage between the second and fourth levels.

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Springs Mines. The Springs Mines report is regarded with satisfaction. The company is still shaft sinking, and it is hoped that the reef will be struck before the end of the year. The cash in hand amounts to £174,000, while the excess of cash assets over liabilities stand at £198,000. The company has, therefore, plenty of money to press on operations, and markets may look up shortly when the outstanding options may be exercised, thus bringing in further funds to swell the coffers. Springs will no doubt be a second Brakpan in time.

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Transvaal Coal Trust. The Transvaal Coal Trust owns 253,000 shares in the Brakpan mines, and 250,000 shares in the Springs Mines, upon which shaft sinking is being pushed on with vigour. From its coal area the Transvaal Coal Trust earned last year £42,848, which enabled the directors to declare a dividend of 7½, and carry forward £7,768. The cash in hand amounts to £61,214, so the position from every point of view is quite satisfactory. When the Brakpan is declaring dividends the Transvaal Coal Trust will pay largely enhanced dividends.

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Electrical Engineers in the Transvaal. It is always good to hear the views of the intelligent onlooker, and those of our contemporary, the *Iron and Coal Trades Review*, on the status of electrical engineers in the Transvaal are, therefore, worth quoting. All parts of the Empire, says that paper, will naturally be interested in a position of affairs which has arisen regarding the status of electrical engineers in the Transvaal, concerning which a deputation recently waited upon Mr. Kotze, Acting Government Mining Engineer. As a result of the interview it was decided that if a certificated electrical engineer went in for the necessary examinations and had his certificate endorsed for all mining machinery, he would be eligible to take over full control. It was also decided that the holder of a mechanical engineer's certificate could go in for the electrical engineering examination and then assume full control. The natural result of the overlapping will be that the engineer of the future will be expected to have mechanical as well as electrical knowledge, both theoretical and practical. The work cannot for much longer continue to be done by two separate persons. The electrical engineer must learn more mechanical engineering and the mechanical engineer will have to be *au fait* with electrical work.

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The Butters Filter. We announced last week the decision of the United States Circuit Court to the effect that the Butters filter does not infringe the Moore patents. This case was begun as far back as March, 1908, by the Moore Filter Co. bringing action against the Tonopah-Belmont mine in Nevada on the ground that by using a Butters filter the mine was infringing the Moore patents. This action the Butters Filter Co. defended, in the interests of its customers, providing thereby a case which, on account of the widespread use of vacuum filters, has been watched with unusual interest. We now learn that the Moore Filter Company has given notice of appeal.

Rhodesia's Gold Harvest.

With the declaration of the February output, the total production of gold in Southern Rhodesia amounts in value to over twenty millions sterling. Considering the enormous difficulties with which the country has to contend, the paucity of the white population, and the gross mismanagement that in the earlier days of mining in Charterland threatened to wreck the whole fabric of the industry, the attainment of the twenty millions standard is an achievement of which Rhodesia may justly feel proud. This gold output is the result of fourteen annual harvests, actual production not commencing until 1898. In that year £83,052 was declared. Seven years ago Matabeleland and Mashonaland first registered an output of over a million, the return for 1905 being £1,449,985. Since then the yield has risen to £2,647,895, which was the value of last year's production. For the first two months of the current year the output has been valued at £424,662.

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The Camp Bird-Messina Deal.

Further particulars are now to hand of the Camp Bird-Messina negotiations. More money is required by the Northern Transvaal Copper Mine for plant, etc., and the Camp Bird Company is assisting in the issue of £250,000 6 per cent. debentures. The assistance consists in guaranteeing five years' interest on these debentures, for doing which it obtains an option over a large block of Messina shares. This debenture issue is offered in the first place to the Camp Bird stockholders. In a circular issued various particulars of the Messina mine are given. The ore mined to June 30, 1911, was 65,788 tons, producing 9,699 tons of concentrate, assaying 53 per cent. copper. Mr. Calderwood, the consulting engineer, estimates that to the eighth level the ore developed and the probable ore make together 430,000 tons, with an estimated profit of £600,000. On this ore reserve it is proposed to erect a smelting plant capable of dealing with 120,000 tons per year, from which it is calculated a total profit of £150,000 will be obtained, or more than ten times that necessary for the debenture interest.

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Katanga Copper Sales.

At the first sale of Katanga copper at Antwerp three weeks ago, a parcel of 413,393 kilos. was sold by the Société Commerciale Belge at 154·25f. per 100 kilos., and a second parcel of 243,390 kilos. and a third of 295,150 kilos., at 156·75f. and 154·25f. respectively. The sale was effected under the so-called system of *vente par inscriptions*, which is applied to the sale of rubber, on account of the Syndicat des Metaux, formed by the Union Minière and through the intermediary firms of Maus and Co. and Grisar and Co. The metal was offered in bars weighing 50 to 200 kilos., which analysed gave 89 to 90 per cent. of copper, 4·5 to 5 per cent. of cobalt, 0·30 to 2 per cent. of iron, and 0·50 per cent. of sulphur. The result of the sale was considered very satisfactory. It is reported that a fresh cargo of 200 tons of copper from Katanga has arrived at Antwerp.

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The East Rand Proprietary Mines.

The improvement in the returns of the East Rand Proprietary Mines during the past three months has been as large as it has been rapid. March operations have resulted in the milling of 163,000 tons of ore and the recovery of 66,147 ozs. of fine gold from all sources. The profit, it is to be observed, is again recorded in six figures, and altogether the declaration is one which should prove gratifying to shareholders. The fly in the ointment, from the point of view of the non-technical shareholder and the man in the street, is that the profit is "abnormal." We have every reason for believing that the March earning of the E.R.P.M. was wholly normal. As a matter of fact, it is likely that it will be improved upon. The feature of the return which is perhaps occasioning chief suspicion is the grade—the yield per ton. We have heard it stated in many usually well-informed quarters that the recovery per ton milled cannot be reconciled with the value of the ore reserves as given in Mr. Ross Skinner's report. Estimating the value of fine gold at £4·247 per oz., the value of the March output works out at no less than £280,926, or approximately 34s. 6d. per ton. We believe that this output includes value derived from accumulations, but only to a small degree. Uninformed criticism has it that the eyes of the mine are being picked out and that the grade of ore declared for last month cannot be regarded as the normal value per ton of the mine, since Mr. Ross Skinner's estimate was 6·9 dwts. per ton. At 34s. 6d. the grade is over 8 dwts., and it might appear that a discrepancy amounting to over one dwt. per ton called for explanation. As a matter of fact, the recovery of the East Rand is perfectly intelligible, and the seemingly high rate of yield is readily accounted for by increased sorting, cleaner mining widths, and the sending of a much lesser quantity of development rock to the mill. It may be that in the future the yield will decline somewhat, but this will be accompanied by a corresponding decrease in working expenditure. There is, in fact, every reason for believing that last month's operations were perfectly normal, at any rate in so far as profit is concerned, and that, of course, is the paramount consideration. The mine is being operated in a perfectly honest and straightforward manner. Development is proceeding in all sections.

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Glynn's Lydenburg.

The following communication from the Secretary of this company reaches us as we go to press:—The following has been cabled to London in response to an enquiry from the London Secretary: "Fall in price shares presumably due to local rumours regarding life of mine. Government Mining Engineer estimates life further six years, excluding Werf Mynpacht covering an area of claims not much less than Mynpacht. Manager considers this estimate conservative. Is confident can maintain present rate profits from developed ore Mynpacht alone for at least three years. Future of company largely depends upon development of Werf Mynpacht. Work only recently resumed there, but 3,725 tons good average ore developed. Too little work done as yet permit estimate of future values, but prospects distinctly encouraging."

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Harmony Proprietary.

The secretary writes:—"We have received advice, dated February 24, that the Selati Railway works have now reached the Farm Berlin, on this company's estate, and will soon cross the Letaba River, making for Tzaneen. The temporary bridge over the Selati River is finished, and the trains run as far as the Blue Jacket mine. There is any amount of labour, and it is expected that trains will run to Delagoa Bay within the next few months."

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Diamond Taxation.

Regarding the duty on diamonds, an interesting point was brought before the notice of the Auditor-General in connection with an audit inspection at Koffyfontein. Diamonds, it seemed, were being exported to Kimberley by the Koffyfontein Mines, Limited, without the levy of one-half per cent. export duty in accordance with the Orange Free State Law Book. Upon instituting inquiries, the Auditor-General learned that, in the case of diamonds sent by the Roberts Victor Mine to Johannesburg for inspection, the Minister of Commerce and the Minister of Finance had consented to the diamonds being regarded as forwarded in transit, and, accordingly, the company was relieved of the Free State export duty and the Transvaal import duty, and was required to pay duty only on export to Europe. Similarly, in the case of the Koffyfontein Mines, Limited, the view was accepted that the diamonds were sent to Kimberley for valuation and the company was relieved of the Free State export duty, although it could not be relieved of the Kimberley registration fees. The concession has, no doubt, become general as being consistent with free trade throughout the Union.

Taxing Ore Reserves.

Taxation of ore reserves is proposed in a bill now before the legislature of Idaho. This, says the *Mining and Scientific Press*, might well be called, " A Bill for an Act to Discourage Stability and Economy in Mining." The same description might be applied with equal truth to the Union Government's action in indirectly taxing ore reserves on the Rand under the Profits Tax regulations.

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Northern Minerals.

The directors of the Northern Transvaal Lands Company announce to shareholders that in view of important mineral developments in the coal, copper, and tin bearing areas of Zoutpansberg and Waterberg, and in the diamond district of Bloemhof, a company has been formed called Northern Minerals (Transvaal), Limited, to acquire five farms from their company in these neighbourhoods to prospect, and, when developments justify, to deal with by flotation or otherwise. By reason of the very low price at which the company's acreage stands in its books, the directors say they have been able to fix the price of sale (which includes both mineral and surface rights) at about 9s. per acre. The purchase price receivable by the company is £15,000 in cash and shares, made up of £5,000 cash, 34,000 ordinary shares of 5s. each, and 30,000 deferred shares of 1s. each. The company is subscribing and paying in cash for a further 30,000 deferred shares, at par (1s.), and will, consequently, hold a substantial interest in its subsidiary. In addition to the 30,000 deferred shares which the company is subscribing in cash, the subscriptions of 50,000 ordinary shares has been guaranteed, thus securing for the new company what is considered will prove to be adequate working capital. Prospecting for diamonds has already commenced on Commissie Rust, in view of very favourable indications in the neighbourhood. The prospectus quotes this paper on the prospects of the tin finds.

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The Position of the New Lisbon-Berlyn.

At the Frankfort mine during the year ending September 30 last, 18,059 tons of ore were crushed, yielding 5,993 ozs. of fine gold, of a value of £25,139, and the costs amounted to £17,984, thus giving a working profit for year of £7,155. The battery of 20 head of stamps and tube mill ran satisfactorily throughout the year. The gas engine alluded to in last year's report was duly installed, and proved of the greatest assistance during the dry season. The extraction obtained continued satisfactory, averaging 85 per cent. of the gold contents of the ore, against 83 per cent. last year. At the close of the financial year Mr. Hunter estimated the ore reserves at Frankfort at 15,000 tons, of an average assay value of 8·87 dwts. When it is remembered that the estimated ore reserves at the commencement of the period under review were 19,615 tons of 9·8 dwt. value, and that during the year 18,059 tons were crushed, it will be seen that the development carried on has maintained a satisfactory reserve of ore in the mine. At Lisbon-Berlyn a considerable amount of prospecting has been carried on by tributors, and in two instances crushing machinery has been erected, but up to the present the results obtained have proved disappointing. The cancellation of the mining concessions of these farms and their proclamation by the Government as public diggings will, it is anticipated, take place in May. This is in accordance with the agreement of August 6, 1910, reported to the shareholders last year. Within the last month, the manager, Mr. Hunter, has been offered and accepted a more important position. He has recommended to the Board a Mr. Colman to fill his place, and, on the advice of the local board in Johannesburg, the directors have sanctioned this appointment. In a memorandum on Mr. Hunter's report, Mr. E. T. McCarthy, the consulting engineer, summarises the situation thus: " On the whole, considering the small quantity of development work done, the position looks hopeful, especially when one looks at the plans, and though not in as strong a position as one would wish as regards ore reserves, leads one to hope that better results may be obtained in development in the coming year."

TOPICS OF THE WEEK.

AGRICULTURE AND MINING.

The annual show of the Witwatersrand Agricultural Society, which closes to-day, must be written down as by far the most successful in the history of the Society. In number, magnitude and excellence of exhibits, in attendance and in high educative value, the show has scarcely been surpassed by any of the older shows of the coast, and its pre-eminence is a striking testimony at once to the progress of South African agriculture and to the Rand as its natural pivot and centre. Apart from the sheep and produce sections, the entries greatly exceeded those of last year; machinery exhibits were almost doubled; and a motor show of considerable importance further extended the scope and value of the whole. Elsewhere we print a detailed description of the machinery and motor sections, and it is enough to say here that both the exhibitors and the Executive Committee are to be congratulated on the high standard and workmanlike character of the exhibits.

It is customary to regard the Rand show as the most potent of the outward and visible signs of the bond between the mining and farming industries, and that aspect cannot be over-emphasised. The speeches made on Wednesday, the opening day of the show, paid due testimony to the connection, and were instinct with the ever-growing good feeling between the twin industries. General Sir Reginald Hart, who formally opened the show, dwelt more particularly on the place of science in agriculture and the value of the Rand as a market and show place for the farmer. Sir Lionel Phillips and the Mayor of Johannesburg, Mr. J. Dowell Ellis, in their speeches, did not fail to draw further attention to this cardinal fact regarding the show. Sir Lionel pointed out that it is now making itself felt from the Cape to the Zambesi, and has representatives of various departments of agriculture from every part of the Union. " The farmer," he said, " is probably the most conservative person in the world, and if you want him to do anything you have to demonstrate first that it is going to be profitable, and, therefore, one of the greatest values of shows is the fact that you have a certain amount of demonstration, and of course an ounce of practice is worth a ton of theory. The farmer on the whole is unable to conduct costly experiments on his farm. He is not as a rule a man who has funds that he can afford to risk in this direction, and therefore it is that such shows are of immense value. Well, the industrial community of Johannesburg, which has had a great deal to do with the getting up of this show into the condition in which it is to-day, is most anxious to see agriculture progress, and does not in any sense begrudge the large sums that are spent by the Administration of this country in the promotion of agriculture. The one thing that they do hope is, of course, that an expenditure of this kind shall be well thought out and should achieve the object that it has in view." The Mayor also spoke very pointedly on the same aspect of the question. He showed that whether it were due to the natural craving of all men to live directly by the cultivation of the soil, or whether it might arise from simple business instinct, the people settled on the Witwatersrand area were quite alive to the fact that agriculture was, and always would be, the predominant industry of any country, and must be the ultimate source of prosperity and comfort. He added that they could scarcely say that the interest of Johannesburg in agriculture arose from feelings of pure unselfishness or benevolence. Johannesburg was already the great centre of agricultural interests. Here the produce was marketed, and here supplies to the agricultural industry were provided and distributed. Johannesburg would therefore thrive with an increase of the prosperity in agriculture.

These statements require no further emphasis. The labours of Sir Lionel Phillips and the public-spirited band of citizens who have seconded his efforts are the most eloquent proof of the attitude of the mining community to the other staple industry. If there is any fault to be found with the farming element for failing to reciprocate, by not attending in the maximum force, the blame, we believe, rests mainly with the lack of facilities afforded them for so doing. Government should encourage the greatest possible attendance from the outside districts, by conveying visitors at the minimum cost, and by making provision for their accommodation when here. The State has everything to gain from the fullest advantage being derived by the greatest number of farmers from the lessons of the show. Good as the attendance of the farmers has been during the past week, we believe it could be even further improved by State action somewhat on the lines we have indicated. No one would grudge the expense, certainly not the town population, who contribute the bulk of the railway revenue, and who are only too anxious that farming should be helped, judiciously and in reason, by the State. Encouraged in this way, we can see a great expansion in the career of usefulness for the forthcoming shows of the Society. Sir Lionel Phillips, indeed, foresees for it, under any circumstances, a future of growth and multiplying activities. In this regard no one is better fitted to prophesy than Sir Lionel, and undoubtedly the Witwatersrand Agricultural Society, with its annual fruit and blossom in the show, has an assured future of growing value to agriculture and the country.

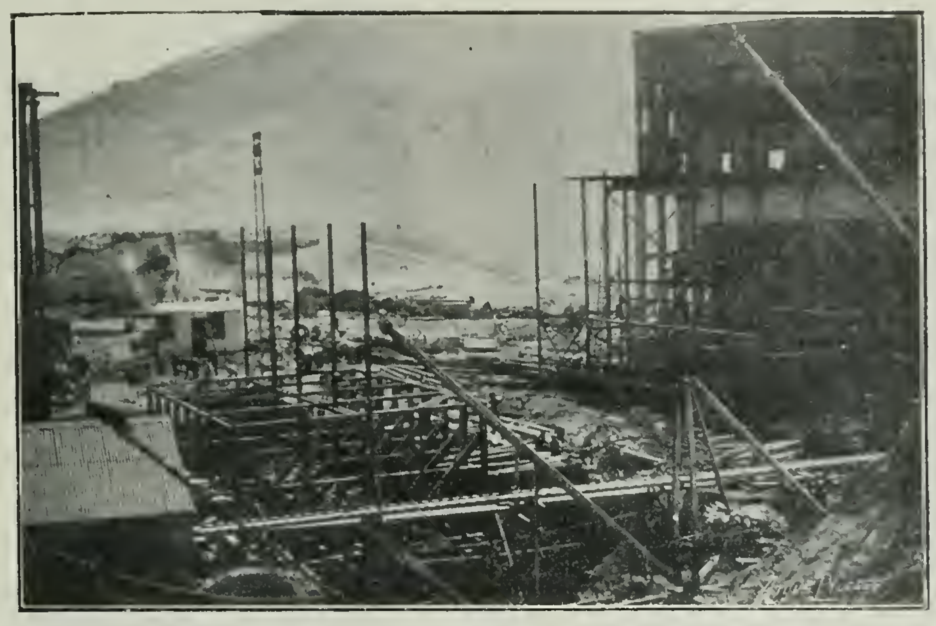
THE FIGHT AGAINST PHTHISIS.

While the employers and mine employees of the Rand are still busy digesting the new Phthisis Bill, and intermittently condemning it, the moment may be seized to turn back to that portion of the report of the Medical Commission in which the great question of the prevention of the disease is discussed. The full report of that Commission, which is now available, shows that the doctors took advantage of the first-hand facts put before them to set down their views of the chances of success for the present campaign against phthisis. These views, as the latest and most authoritative, are obviously of great importance, and we believe they merit more extended consideration. From the evidence which the doctors' investigation elicited regarding the extent to which miners at work are affected by miners' phthisis, and from the data respecting the disproportionate number of deaths from phthisis occurring annually amongst underground workers, it is clear that after eight years of attention devoted to the question in this country the community is still faced by a very grave problem in the endeavour to combat the incidence of this disease. The recommendations of the Mining Regulations Commission have resulted in the incorporation in the Mines, Works and Machinery Regulations of 1911 of several new and important provisions relating to ventilation, and to the control of the generation and dissemination of dust in mining operations. They modify and extend in several important respects those previously in force, and fix more definitely individual responsibility for their observance. The new regulations constitute a very important advance. The experience of the past few years has shown that the prevention of the disease is a very complex and difficult problem. Although the main principles involved—an adequate supply by efficient general and local ventilation of fresh air to all working places and the control of dust by means of water—are universally understood and accepted, the detailed application of these principles in the elaboration of the best practical methods to secure the ends in view has proved to be far from a simple matter. It is recalled in the report that during the last three or four years much attention has been devoted by those responsible for the control of the mines to the question of mine ventilation. It is pointed out, for instance, that in 1909 a general system of mechanical ventilation was installed in the East Rand Proprietary Mines, which included in a single ventilating system four of the mines of that group, and since that date fan ventilation has been introduced by other mining groups into a large number of the mines under their control. This important work should effect a considerable amelioration of underground conditions. Detailed attention is also being everywhere increasingly paid to dust control by means of water. The report expresses the hope that by the energetic co-operation of the Mines Department, the mine managements, and the miners, a systematic and uniform policy may be rapidly elaborated, which will effectively and permanently reduce the incidence of chronic lung diseases amongst miners. Much experimental work appears still to be necessary in this direction before the best possible results can be attained. The regulations regarding dust prevention at present in force apply mainly to rockdrill and development work. But the doctors' investigation has abundantly shown that *all* underground workers are exposed to serious risk of contracting the disease. No doubt this is in part due to the indirect effects of rockdrill work and the heavier blasting charges used in connection with it in disseminating finely-divided dust throughout the mine, but it is clear that measures for the prevention of dust to be fully effective must be systematically applied generally and in all parts of the mine. There appears still to be urgent need for a combined experimental investigation on the part of the Government and the mine managements which should aim at the elaboration, introduction and operation of a uniform and systematic standard of the practical methods which should be applied to each form of mining work in detail both in regard to general and local ventilation and to dust prevention in order to combat at every point the conditions which produce miners' phthisis. The report adds that when this practical standard has been agreed upon it is recommended that it should be systematically and uniformly enforced in all mines and a sufficient body of inspectors should be maintained to ensure that the methods proved to be the best are everywhere effectively carried out, and that a uniform routine of discipline in respect to them should be established by the active co-operation of the mine managements and the miners. The necessity of uniformity between mine and mine is apparent. Laxity of discipline in one mine renders it difficult to maintain in the others. The solution of the mechanical problem of ventilation and dust prevention does not, of course, cover the whole ground of the prevention of miners' phthisis. The report states that the control of tuberculosis, the use of change houses, the living conditions of the miners, hours of labour, and the effects of the contract system in mining work must all be taken into consideration in an adequate view of the question. No doubt the Committee of Engineers now sitting, under the presidency of Mr. R. N. Kotze, will note and profit by these views of the doctors' Commission.

THE CROWN MINES' CRUSHER STATIONS.

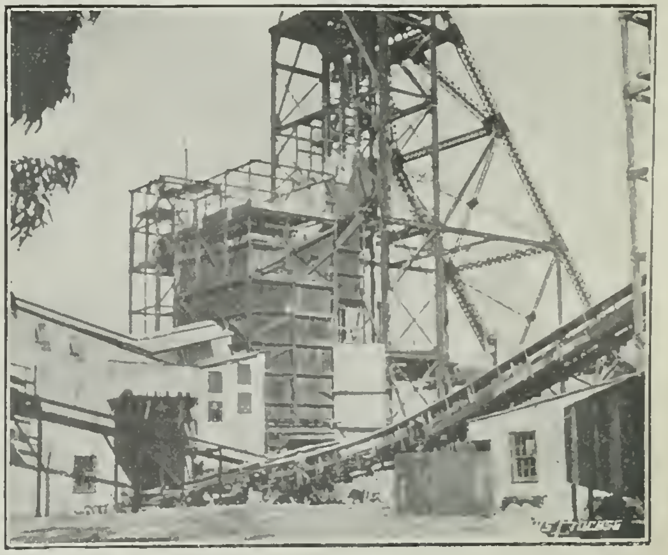
Importance of the Two New Stations in the Centralised Operations' Scheme.

The importance of the two new crusher stations in the Crown Mines' scheme of centralised operations will be evident from the fact that the greater portion of the output of this vast property will be hoisted, sorted and crushed at these points, the capacity of the station at the No. 7 shaft—the one already completed—being 5,000 tons, and that at the South Rand or No. 5 shaft being 6,000 tons per shift. The latter is still in process of construction. The shafts are connected underground, it may be remembered, by a main level, the thirteenth, which will run in a straight line from one end of the property to the other, at a vertical depth of rather more than 2,000 feet, the width being 14½ feet and the total length over three miles. It will be served by mechanical haulage, and for some years the bulk of the ore broken in the Crown Mines will be handled along this level, and, as already remarked, through the No. 5 and No. 7 shafts. The length of the main level between its connections with these shafts is nearly 5,000 feet, the No. 5 shaft being located almost vertically over the drive and the No. 7 being connected with it by means of a crosscut approximately 1,700 feet in length. The ore from the crusher stations, which are linked up with each other and the four batteries of the company by lines of railway, is conveyed to the required points in steel trucks, which have a capacity of 15 tons. The equipment of the No. 7 or western shaft was completed about the middle of last year. Double-stage winding is carried on here, and the entire tonnage from the western section is being hoisted and handled on day shift only, the whole process working very smoothly. Some idea will be obtained from the accompanying illustrations of the extreme solidity of the structural portions of the two crusher houses. Reinforced concrete, it will be seen, is the material used for the ore bins themselves and their supports, as well as for the working floors at the various levels of the build-



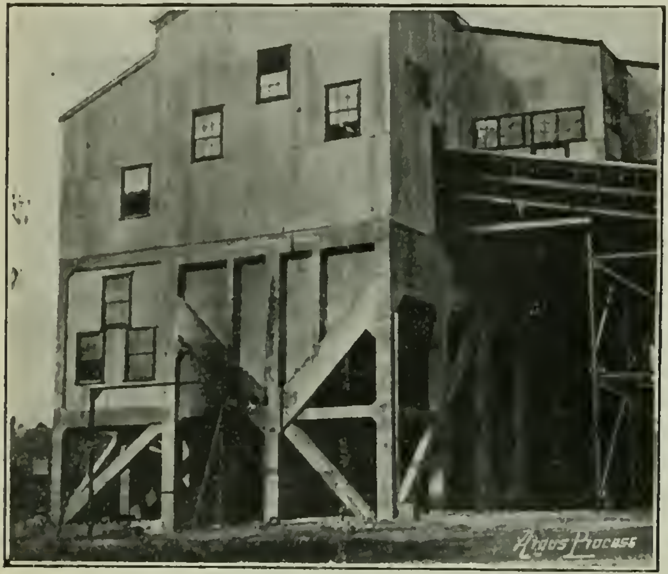
General View. Crusher Floor in Upper Left Corner.

Construction Work, South Rand Sorting Plant.



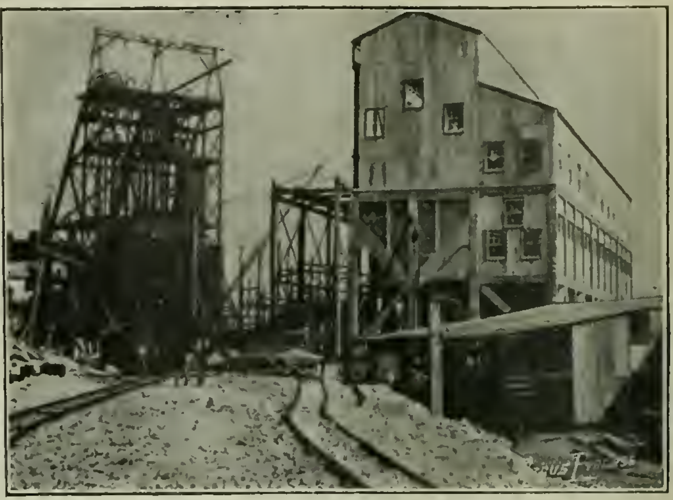
No. 7, or Western Main Shaft, Crown Mines.

ing. Taking the crusher house at the No. 7 shaft first, for purposes of description, it may be explained that the ore bins comprise the V-shaped structure which occupies the greater portion of the lower half of the building. The central opening shown at the end between the columns is that through which the trucks are conveyed, the rails being several feet below the level of the ground as it appears in the picture, in which the cutting is only faintly indicated. Solid concrete walling, it will be observed, runs below the angle of the ore bin, and upon the further side of it are ranged the shoots, the doors of which are controlled by pistons actuated by compressed air. Upon the lowermost floor shown, where the end lights are three windows in a group, are located the motors which drive a series of crushers supported on concrete beams immediately over the ore bins. The remaining set of crushers are driven from motors upon the second floor directly above the first, already alluded to. The gear which regulates the mechanism of the ore bin shoots is worked from a platform which runs below the first floor in the bay upon the further side of the track, and the ease with which the operation of opening and closing the doors is performed is worthy of remark. The upper portion of the crusher house is constructed of steel framing with galvanised iron covering. The sorting house, which occupies the whole space between the shaft and the crusher house, is built of steel framing with the same kind of covering. In the illustration which shows the No. 7 shaft, the ore bins at the shaft, from which the rock is delivered to the washing trommels and thence to the sorting belts and the lower extremity of the sorting house can well be seen, together with the waste rock belt along which the material sorted out is sent to the dump.

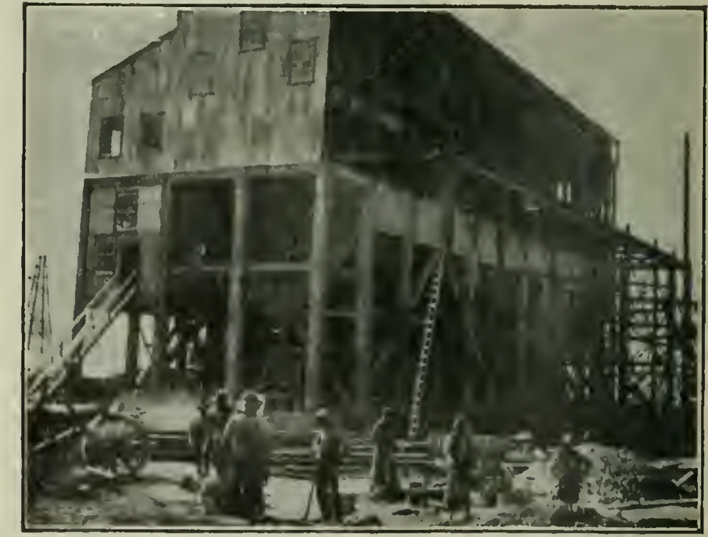


Crusher and Sorting Station, No. 7 Shaft.

The crusher station at the South Rand or No. 5 shaft is still in process of construction. There are four sorting belts provided for, the waste rock being dropped on to the return portions below and thence to a hopper which delivers to trucks. There are three Blake crushers to each belt, two driven by motors from the lower floor and the third by a motor on its own floor. The exigencies of space have necessitated this arrangement of the drive. Our illustrations show the South Rand shaft and the construction works of the crusher and sorting station there. The vast size of the building and its very evident solidity will not fail to attract attention.



South Rand Shaft and Crusher Station.



South Rand Shaft Crusher House.

Few are aware of the existence of a School of Mines at the Crown Mines (Western Section), says the *Klerksdorp Record*. The men required are to be totally inexperienced, as they will be taught everything necessary, and they will commence at a rate of 8s. per day, and of course the increase will come with experience. The school is situated on the outcrop part of the mine, therefore quite healthy, and no fears need be entertained on that score. This is really an exceptional opportunity for anybody—"won't-works" excepted—and the terms are almost incredible. All married men with families will be given preference, and houses will be supplied by the company at a nominal rental of 15s. per month, the idea being to get them settled on the property and so to ensure steadiness.

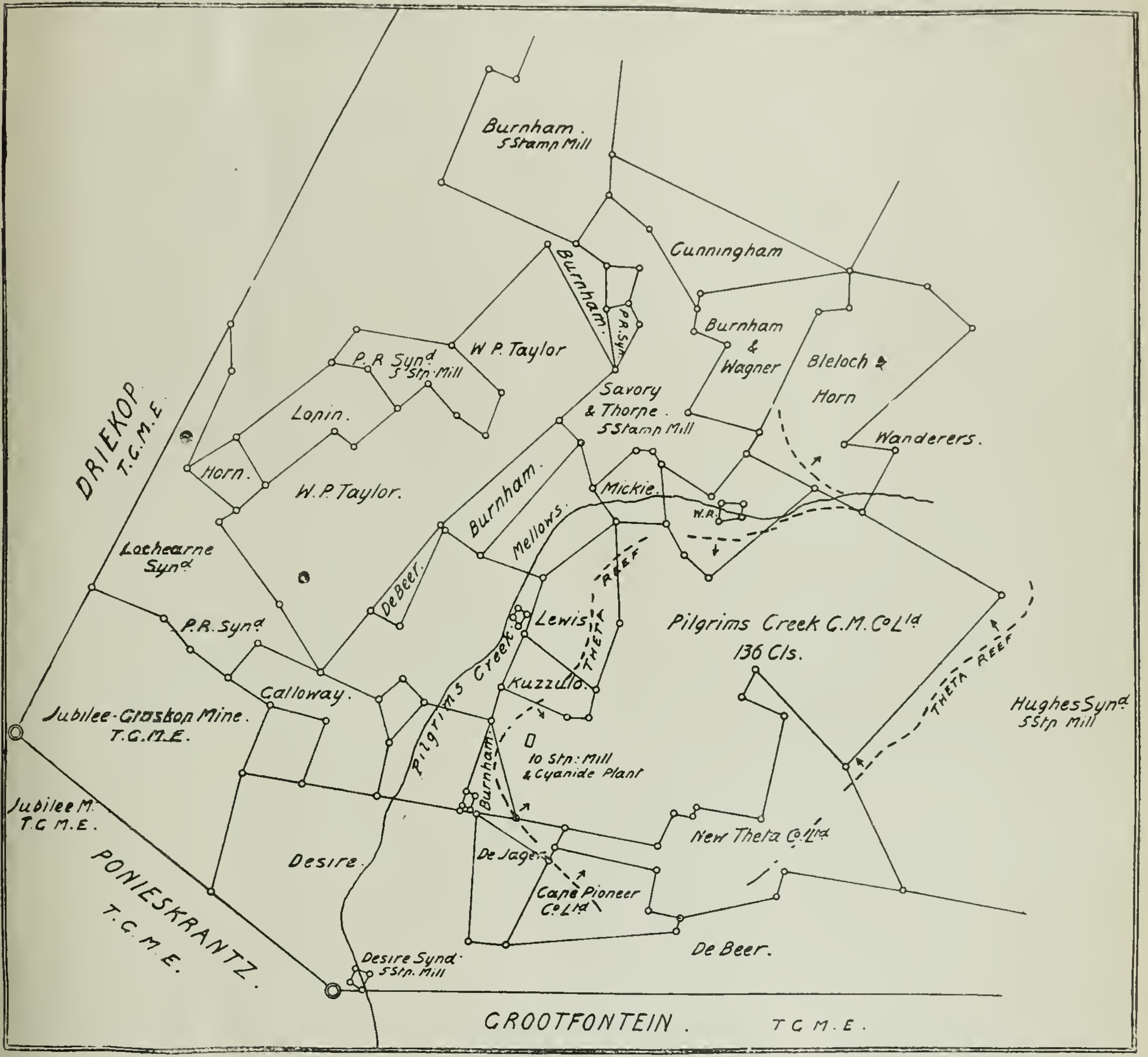
Ceylon Lydenburg Output.

Particulars of the March output are now available:—Tons crushed, 537; yielding 471 ozs. fine gold; total value of month's output, £1,980; estimated profit for the month, £1,231.

Premier Diamonds.

The Premier Company announces that the fifteenth dividend on preference shares of 125 per cent., or 6s. 3d. (Six Shillings and Threepence) per share for the half-year ended 30th April, 1912, will be payable to all shareholders registered at the close of business on that date.

A PILGRIMS REST MAP.



Principal Properties on the Farm Graskop.

The Edinburgh Castle, which left Capetown last week, took £620,409 worth of gold for England. The shipments from the respective banks were:—Standard Bank of S.A., Ltd.: Transvaal gold, 58,418oz., value £218,980; Rhodesian, 14,165oz., value £52,335. National Bank of S.A., Ltd.: Transvaal 81,989oz., value £292,698; Swaziland 270oz., value £1,085. African Banking Corporation, Ltd.: Transvaal 15,092oz., value £55,311. This gives a total of 74,329.89oz. of Transvaal gold; 14,165 oz. Rhodesian, and 270oz. Swaziland, or altogether 126,934.89oz. The total value of the Transvaal shipments was £566,989; Rhodesian, £52,335; and Swaziland, £1,085. The largest amount of gold ever shipped in one boat is £1,143,271, carried by the Kildonan Castle in July, 1909. The Armadale Castle on her last voyage carried £1,111,453, and by way of comparison it is interesting to recall that the maximum amount embarked on one steamer prior to the war period was £673,000, sent over during 1899. From April, 1907, to February, 1912, thirteen gold shipments have exceeded one million sterling in value, and the total of these thirteen shipments is £13,613,088.

Gold Shipments.

Voorspoed Diamonds.

The following cable was sent to the London secretaries of the Voorspoed Diamond Mining Company on the 4th of April:—"Publish returns for quarter ended 31st March, 1912. 365,169 loads hauled, 360,158 loads washed, 41,489 carats found. Average 11·52 carats per 100 loads. Some alterations crushing plant urgently required in order to improve efficiency and capacity. Pending decision nature and extent alterations mine being worked day shift only. Further financing required meanwhile has been arranged satisfactorily."

METALLURGICAL PROGRESS ON THE RAND.

South African and American Practice—Further Innovations Likely.

Metallurgical practice on the Witwatersrand can be said to compare most favourably with that of any other gold field. In some particulars the modern reduction and treatment plants of the Rand are doubtless better than those installed anywhere else. They are larger and probably better organised, whilst the type of material employed is only excelled by the Rand's readiness ever to experiment with and purchase any new type of metallurgical plant that may give promise of bettering extraction or reducing the cost of treatment. The Witwatersrand is for ever testing at one or more of its many mines improved appliances in metallurgical engineering or improved methods and new ideas in chemistry. At the present one or two new ideas in cyanidation are being given attention, and a host of various minor patents relating to stamp batteries, tube-mills, classifying appliances, and cyaniding plant are constantly being tried at some mine or other.

Residue Values Decreased, Costs Lowered.

The sum total of these many inventions has had the effect of not only greatly reducing the value of residues, but at the same time the cost of milling and treatment has been lowered to a very marked degree. Contrast, for instance, the 95 and 96 per cent. extractions which are secured by the majority of the Rand's important mines to-day with the 85 or 86 per cent. recoveries which were deemed good in the pre-war period, and, indeed, during the months that immediately followed the war. Contrast, too, the "reduction expenses" of a huge property like the Crown Mines with two or three mills and cyaniding works all replete with the latest inventions and developments in the metallurgy of gold at about 4s. per ton with the expenses prevailing at the same plants a few years ago.

The Rand v. America.

It is perhaps a somewhat curious thing that the Rand, progressive as it is, and managed by the best technical brains obtainable, has evolved so few really important devices or methods. It is true that Dr. Caldecott has given to the metallurgical world valued gifts in the sands tables and cones that are associated with his name. It is also true that the Rand in a very large measure gave birth to the cyanide process—the saviour of many a low-grade and pyritic field. But, admitting all this, it is a fact that virtually all the most recent innovations in metallurgy, such as Pachuca vats, the Merrill zinc dust process, filter presses, the Trent agitator, Dorr slimes thickener, etc., are the products of other parts of the world—chiefly of America. American metallurgy has made wonderful strides in the past few years, and further new inventions are continually being made there. In the Western States cyanidation men appear to be specially active. Particularly interesting are the results secured at the Victor Mill of the Portland Gold Mining Company at Cripple Creek. The excellent work done last year at this plant is attracting very favourable attention. An American correspondent informs us that among the improvements made at the mill since the beginning of this year is the installation of a large Portland filter of the revolving drum type. The former equipment filters have the following dimensions:—Diameter, 12 ft.; face of drum, 9 ft.; capacity, about 45 tons of pulp per 24 hours. The new large filter is 14 ft. in diameter, with a 12 ft. face, and has a capacity of 90 tons of pulp in 24 hours. In addition to the larger capacity, there are advantages in the deeper submergence of the filter in the pulp, and better opportunity for washing the cake free of cyanide solution and dissolved metals. At the Colorado Springs mill of the same company the old equipment for chlorination—chlorination is to-day a back number in the metallurgy of gold—is being abandoned, and the mill is being converted into a modern cyanide plant. The preparation of the ore, including roasting, is being retained as before. It will then be ground in tube mills in cyanide solution and filtered in two 200-ton Merrill presses. Zinc dust precipitation plant will also be installed. Witwatersrand metallurgists are such keen students of progress in other parts of the world, and are always so ready to adopt new methods, that the foregoing should prove of some local interest.

New Heriot.

The returns for last month's operations at the New Heriot Mine are as follows:—Tons milled, 11,370; ounces recovered, 5,108; profit, £8,869; and, in addition, all the reserve gold has now been declared, value £1,279. In deference to the wishes expressed by shareholders and others, it has been decided to discontinue the carrying of reserve gold, and the amount in reserve at the end of February has been declared with the results for March as a special item. In future the actual results will be declared, and shareholders must realise that variations in the amount of profits may occur from month to month. Any circumstances entailing abnormal results will be explained when monthly profits are declared.

City and Suburban.

The following are the results of the City and Suburban operations for March:—Tons crushed, 26,545; gold recovered, 11,750 fine ozs.; profit, £19,737, and in addition all the reserve gold has now been declared, value £26,412. In deference to the wishes expressed by shareholders and others, it has been decided to discontinue the carrying of reserve gold, and the amount in reserve at the end of February has been declared with the results for March as a special item. In future, the actual results will be declared, and shareholders must realise that variations in the amount of profits may occur from month to month. Any circumstances entailing abnormal results will be explained when monthly profits are declared.

Sheba and Rosetta.

The output from the Sheba Mine for the month of March was 2,813 ozs. of fine gold, and the output from the Rosetta Mine was 386 ozs. of fine gold.

New Kleinfontein.

The following is a copy of a cable sent to the London Offices of the New Kleinfontein Co.:—Stamps run, 220; tons milled, 39,880; fine ounces output declared, 13,085; value, less cost of realisation, £51,774; working costs, £40,662; working costs per ton, 20s. 5d.; profit declared, £11,112; capital expenditure, £12,117. It is expected that the additions to the reduction works will come into operation by the end of April.

"Jumpers"-Treasury Results.

The following cable has been despatched to the London Agency of the Jumpers Company:—"The following is the result of the joint working of the Jumpers and Treasury mines during last month: 80 stamps, working 26 days, crushed 8,550 tons, yielding 2,126 ounces of fine gold from mill, 1,126 ounces of fine gold from tailings by cyanide, 328 ounces of fine gold from current slimes, and 229 ounces of fine gold from accumulated slimes; total from all sources, 3,809 ounces of fine gold; value of output, £15,998; joint profit for the month, £1,524; position of joint gold reserve at end of last month, 1,014 ounces of fine gold."

THE RAND'S ORE RESERVES.

Over One Hundred Million Tons of Profitable Ore Developed—Figures for Groups and Individual Mines—Reserves Three Years Ahead of the Mills—£140,000,000 in Gold Awaiting Removal.

Hereunder we present our usual annual table of Rand ore reserves, and, as in previous years, it has been made as complete as reports and technical statements will allow. The majority of the tonnages and values given below are those developed and valued as at December 31st last. Where such figures are not available, the statistics are culled from the last annual reports published. We have often remarked on the lack of uniformity exhibited in official declarations as to ore in reserve. No one can realise to a proper degree how great this dissimilarity between the returns of different companies is until an attempt has been made to prepare such a schedule as is given hereunder. Some companies declare their developed ore in terms of mining tons, others in terms of milling tons; that is to say mining tons, subject to deductions on account of sorting. In some instances one comes across references to suspense accounts in ore reserve statement. Certain companies state the amount of ore recoverable in shaft and stope pillars, etc.; other companies do not enlighten one in this respect. These are but a few of the differentiations to be observed. There are, too, naturally many variables resulting from different thicknesses of reef, and therefore different stoping widths, etc., in different mines. Furthermore, as working costs vary materially as between one mine and another, the pay limits vary largely. These latter inconstant factors are, of course, decreed by the conditions peculiar to each mine, and are thus inevitable; but we certainly think it would be to the great advantage of shareholders were the methods of declaring reserves, as between different groups and different mines, brought more closely into line.

Ore Reserves of the Groups.

The tables given herewith classify the ore reserves of the mines according to the various controlling houses or groups, and deal with only "payable," fully exposed and fully valued tonnages, except in one or two special instances. The group aggregates are as under:—

	TONS.
Central Mining and Investment Corporation ...	36,999,442
Affiliated companies with head offices in Natal	1,358,800
Consolidated Gold Fields of South Africa. ...	9,199,000
East Rand Proprietary	6,716,605
Anglo-French Group	1,753,370
General Mining and Finance Corporation ...	5,842,556
S. Neumann and Co.	4,183,962
Johannesburg Consolidated Investment Co. ...	5,814,231
Randfontein-Langlaagte Group	6,940,166
A. Goerz and Co.	1,949,207
Consolidated Mines Selection	1,925,346
Total	82,682,685

If to this total be added ore partially developed or partially valued, the great bulk of which may be assumed to be "payable," and there be also added the tonnages of pay rock awaiting mining in a few comparatively unimportant mines not included in the above, a grand total of slightly over one hundred million tons is arrived at, a figure approximating fairly closely to that advanced in this journal a year ago in regard to ore developed at the end of 1910.

Features of the Year's Work.

A small increase is to be observed in the aggregate tonnage blocked out, but nothing very significant or important. Neither is any appreciable difference to be observed in the assay value. During the past twelve months the mines have been engaged in bettering underground working conditions and meeting the continued shortage of native labour by strenuous endeavours to substitute mechanical appliances wherever possible, rather than in advancing development to any remarkable degree. The existing legislation does not encourage companies to advance development very much ahead of the mill. It may also be remarked that the majority of Witwatersrand mines are now in a strong position with regard to ore reserves, and, taking the aggregate reserve for the whole Rand at 100,000,000 tons on mixed milling and mining bases of estimation, and the annual rate of crushing at 25,000,000 tons, the ore blocked out is three years or more ahead of the combined batteries. During the past year some companies largely increased their tonnages in reserve—the Crown Mines, for instance, added close on four million tons to its reserves. On the other hand, some companies, through encountering poor zones, show a decline. The influence of working costs must here have to be taken into account—the raising of the pay limit consequent on higher working expenditure meaning a decrease in reserve, and *vice versâ* a lowering in that factor (as a result of decreased costs) an increase in the total.

A Vast Hoard of Gold.

We do not propose to hazard any hard-and-fast figures as to what this vast tonnage of ore—this enormous stock-in-trade of the industry—may mean to shareholders in dividends, or to the country in working costs. Obviously the accumulation of such a colossal tonnage of profitable ore ready for stoping makes for industrial stability. Even so, the Rand is still largely at the mercy of legislation, labour difficulties and a thousand and one other factors. It is, in fact, at the caprice of the Government and the "coloured gentlemen" to a degree which deters us from venturing predictions as to the ultimate dividend value of the one hundred odd million tons above arrived at. We may, however, with some degree of confidence, in the approximate accuracy of our calculations, advance the estimate that this tonnage contains gold of a total recoverable value amounting to about £140,000,000.

In the above calculations no account has been taken of the many millions of tons of low-grade ore—the accumulations of years of exploitation—which are standing developed in the mines. Much of this low-grade ore is verging on the profit line. It needs but a happy swing of the pendulum of the industrial clock to transfer several millions of tons from the unprofitable to the profitable side of the Rand's ledger.

Central Mining and Investment Corporation—

		Tons.	Dwts. per ton.
Bantjes Consolidated		896,087	7·3
City Deep		2,078,805	8·1
Crown Mines		10,124,072	7·25
Durban Roodepoort Deep...		1,288,071	6·8
Ferreira		324,603	8·13
Ferreira Deep		1,837,808	9·7
Geldenhuis Deep		2,262,840	6·2
Modderfontein B.		2,355,700	7·5
New Modderfontein		3,341,830	7·6
Nourse Mines		2,050,705	6·6
Robinson ...	1,221,661	—	11·4
	305,000*	—	—
	1,307,133	—	4·2
		2,833,794	
Rose Deep		3,670,160	6·0
Village Deep		2,159,792	6·1
Village Main Reef		1,775,175	9·2
Totals		36,999,442	

*Estimated tonnage recoverable from old workings, etc.

Companies with head offices in Natal, managed by the Central Mining and Investment Corporation—

City and Suburban	789,084	7·6
New Heriot	569,716	8·4
Totals	1,358,800	

Consolidated Gold Fields of South Africa, Ltd.—

	Tons.	Dwts. per ton.
Jupiter	1,089,000	5·74
Knights Deep	1,650,000	5·2
Luipaardsvlei Estate	432,000	5·2
	142,000*	5·3
Robinson Deep	1,140,000	7·2
Simmer Deep	1,312,000	4·9
Simmer and Jack Prop.	2,500,000	6·4
Simmer and Jack East	934,000	5·4
Totals	9,199,000	

*Part developed.

Farrar Group—

	Tons.	Dwts. per ton.
East Rand Proprietary	6,716,605	6·9

Anglo-French Group—

	Tons.	Dwts. per ton.
Benoni Consolidated	606,839	6·56
New Kleinfontein	1,146,531	7·49
Totals	1,753,370	

General Mining and Finance Corporation—

	Tons.	Dwts. per ton.
Aurora West	345,578	5·85
Cinderella Consolidated	740,157	6·73
Van Ryn	1,655,910	6·37
Meyer and Charlton	312,336	10·099
New Goch	962,575	5·06
Rand Collieries	374,200	5·375
Roodepoort United	448,800	5·49
West Rand Consolidated	1,003,000	5·25
Totals	5,842,556	

S. Neumann and Co.—

	Tons.	Dwts. per ton.
Consolidated Main Reef	516,890	6·7
Knight Central	644,300	6·04
Main Reef West	628,260	7·0
Vogelstruis Cons. Deep	149,530	5·9
Witwatersrand Deep	1,436,202	6·79
Wolhuter	808,780	6·45
Totals	4,183,962	

Johannesburg Consolidated Investment Co.—

	Tons.	Dwts. per ton.
Consolidated Langlaagte	1,619,647	6·7
Ginsberg	367,646	6·8
Glencairn	925,000	3·5
New Primrose	423,311	6·7
New Rietfontein	361,484	6·1
New Unified	288,343	6·73
Van Ryn Deep	603,716	7·17
Witwatersrand	1,225,084	5·65
Totals	5,814,231	

The Randfontein-Langlaagte Group—

	Tons.	Dwts. per ton.
Langlaagte Estate	1,281,307	—
Randfontein Central	5,658,859	7·24
Totals	6,940,166	

A. Goerz and Co.—

	Tons.	Dwts. per ton.
Geduld Proprietary	607,300	8·18
Lancaster West	472,700	6·65
May Consolidated	212,707	6·84
Princess Estate	656,500	7·26
Totals	1,949,207	

Consolidated Mines Selection—

	Tons.	Dwts. per ton.
Brakpan Mines	1,925,346	6·73

Tin: Some Comparisons and a Caution.

A correspondent writes to the "Financial Times" as follows:—As one who would be glad to see the establishment of a stable tin mining industry in Northern Nigeria, I was naturally greatly interested to hear the first detailed information afforded by the chairman at the meeting of the Anglo-Continental Mines as to the discovery of an extensive tin-bearing lode in the new field. But it is to be hoped that the shareholders of the company itself and the public generally will observe Mr. Turner's emphatic warning and not indulge in too inflated anticipations on the basis of first results, although these are undoubtedly highly encouraging. It would be a great pity to forsake the substance for the shadow, but it is evident that the officials of this company, at any rate, can be trusted to press on with the usually more easily remunerative work of alluvial tin mining and not to neglect it for the, perhaps, more interesting prospecting of the lodes. It must not be forgotten that where a few pounds of black tin to the ton of gravel will pay handsomely, at least 20 lbs. to 30 lbs. of tin per ton of ore, even at the current high price for the metal, are required to repay the opening up of lode mines except where decomposed surface deposits can be worked by quarrying. This explains why the great bulk of the 100,000 tons or so of tin produced annually throughout the world is still won by alluvial mining.

A few years ago the production of tin from lode-mining in the Straits Settlements was only about 1½ per cent. of the whole output of the territory, which produces more than half of the world's output of the metal. This is in spite of the fact that miles of tin-bearing lode formation are known of in the Malay States. Similarly, although the alluvial deposits of the Dutch possessions of Banca and Billiton have been worked for some 200 years, very little has ever yet been done in the way of lode-mining. Yet quartz veins have been found, in which large lumps of ore occur, averaging 10 per cent. tin.

Bearing the above facts in mind, one must naturally regard conservatively the tracing of five miles of stanniferous outcrop on the Anglo Continental's area, despite the fact that the first samples from a small section of the lode have given such magnificent results as 24 and 25 per cent. of tin. One would like to know whether these samples have come from a surface decomposed deposit, such as has yielded enormous profits at the famous Mount Bischoff mine in Tasmania; whether they are from a pipe, such as the pipes that are being successfully worked by the Zaaiplaats Company in the Transvaal; or, finally whether they are from the zone of secondary enrichment in a fissure vein, such as that which has been opened up to a depth of 3,000 ft. in the Dolcoath mine in our own country. Mines of tin-bearing lodes are known in several parts of the world. In South Carolina (U.S.A.) a tin-bearing belt fully thirty miles long has failed to produce so far any important mine. But it would be amazing if, in such a richly stanniferous area as Northern Nigeria is now proved to be, payable lode mines are not opened up. Besides the lodes referred to at the Anglo-Continental meeting, the Keffi Company is prospecting a similar formation not many miles from Jemaa, and I understand that a private syndicate has also discovered a very extensive lode. But it is one thing to work alluvial with unskilled labour and inexpensive appliances, and another thing to risk capital on providing the extensive plant and skilled labour necessary properly to deal with lode mines, even when reasonable indications of payability have been found.

Take two extreme instances of failure and success, respectively, in tin-lode mining. Many people may remember Johannesburg's ill-fated tin boomlet of 1905, founded on the first results from the Vlaklaagte farm of the South African Land and Exploration Company. The body of ore discovered was stated to be 20 to 50 ft. wide, assaying £25 to £50 worth of tin per ton (one sample giving as much as 38 per cent. of the metal), and to have been traced for a distance of 1,200 yards. "Sallies," as the shares of the company were called, rose to over £8 apiece. Several hundred tons of ore were raised, reported by competent authorities to assay 15 per cent., but the first crushing was disappointing. Operations were soon suspended, and the shares fell as rapidly as they had previously risen. That is one side of the picture. "Sallies'" disappointing record has, however, not prevented the finding of payable tin mines in the Transvaal since that time. On the bright side one can quote as the most prominent examples the Mount Bischoff, which has produced £2,000,000 worth of tin and paid £1,000,000 in dividends, and the Dolcoath, which has raised copper and tin—mainly the latter—to the value of £8,000,000 and distributed over £1,250,000 in dividends. But it may be pointed out that the Mount Bischoff has won most of its ore from quarrying. For instance, one lode, which carries shoots giving values of up to 50 per cent. tin ore, averages only 1 per cent. in bulk, and up to a recent date, at any rate, has not been worked by the company. But rich tin mines, like rich gold mines, are the exception, not the rule. In New South Wales, to quote yet another example, stanniferous pipes have been opened out carrying 50 per cent. of cassiterite (black tin, or tin oxide) per ton, but they usually thin out at a depth of 30 or 40 ft., and the colony has not so far figured as a big factor in the world's tin production.

THE "T.C.L." REPORT AND THE TIN INDUSTRY.

An Interesting Review of Geological Conditions—Tin in the Felsites and Rooiberg Beds—The Fissures and Pipes of the Pietpotgietersrust Region.

The wide and varied interests held by the Transvaal Consolidated Land and Exploration Company, Ltd., in tin-bearing properties in the Transvaal invariably lend a special importance to the annual reports of the company. The one recently published contains a great deal of information which is well deserving of the attention of those who make a study of the geological conditions of the Waterberg tin fields. The farms Welgevonden No. 777 and Welgelegen No. 357 may first be considered—although they do not take precedence in the consulting engineer's report—because they are the first in order as one goes south from the granite area in which the Groenfontein occurrences are situated. These properties lie adjacent to each other, on the south side of Solomon's Temple, and at a distance of about five miles from the T.C.L. battery on Roodepoort. The existence of cassiterite is closely associated with the intrusive contact between the granite and the overlying felsites, and most of the workings referred to by the Geological Survey in their memoir are situated on or near the contact line, which can usually be located at the surface by the occurrence of numerous conspicuous blocks of mineralised country rock showing a considerable degree of alteration, due to the introduction of tourmaline, silica, etc. Mineralisation appears to have taken place, along this zone, along irregular fissures and joint planes for a short distance only on either side of the actual contact. In the deeper portion of the workings, when carried down to a depth of about 50 feet below the contact plane, the granite is hard and unaltered, and shows no sign of impregnation with either tourmaline or cassiterite. This feature in connection with occurrences at the contact is one of some importance to those who are prospecting at that horizon elsewhere, and as far as we are aware, no other conflicting evidence has been obtained in other parts of the neighbourhood.

The operations of the T.C.L. appear to have been carried on in continuation of workings made formerly by a syndicate upon what was supposed to be Waterval ground. A re-survey showed that the workings were really on the company's area, and the development was continued by them. The horizon in which these workings are located, however, is considerably higher than the contact zone already alluded to. It is in the felsite, near the line of the Sterk River shales, and not far below the Waterberg conglomerates, which in this vicinity have overlapped and hidden the shales to some extent. A few rich leaders are found at this horizon, but the occurrences are variable and patchy, and the ore is often found to get poorer in depth. It is apparently upon some of these that the T.C.L. workings are located, and have extended, according to the report, to a vertical depth of 260 feet and a lateral development of 170 feet, the deposit being "irregular in character, patchy in values, and at present of so low a grade that it is not proposed to work it."

Witfontein and Newbury.

A long distance intervenes between the two properties just referred to and Witfontein No. 371 and Newbury No. 937, which are situated about fifteen miles west by south of Nylstroom, on the stretch of felsite which sweeps northwestwards from the Warmbaths Station. It is in a district which is best known; perhaps, as being the scene of the activities of the Transvaal Bischoff and the Waterberg Tin Mining Company of happy memory. Newbury and Witfontein are quite adjacent, in fact, to Elandsfontein, where the latter company carried on mining, crushing, and concentrating operations for a time. According to Mr. J. Jervis Garrard's report, some 918 feet of driving and sinking in addition to 2,131 feet of surface trenching, have been carried out on an occurrence in the shales and felsites of the Lower Waterberg series. High tin values have recently been found in places on a fissure which, from lying in the bedding planes of the shales, has continued down nearly vertically through them. It has the appearance of a permanent lode, we are informed, "although to forecast future possibilities in this vicinity, where so many disappointments have been met with, is not advisable. All that can be said is that the occurrence, so far, promises well." It is interesting from its obvious resemblance to the Doornhoek occurrence to the north-east, and it may be noted that it is generally different, as regards its geological conditions, from most of the other deposits that have been worked upon in the neighbourhood.

Weynek.

The results of exploratory work at Weynek No. 763 are of interest inasmuch as they show that there is a tendency to diminution of values, on the western outskirts at any rate, of the Rooiberg area. There is, moreover, not the same variety of fissuring here that is so characteristic of the Rooiberg mine, some four miles to the east, and the cassiterite occurs in well-defined lodes which have a low westerly dip of about 16 degrees, instead of being somewhat steep, as at the property referred to. The tonnage developed is approximately 13,000 tons of an average value of 1·79 per cent. metallic tin over an average width of 34 inches, and although a development footage of 649 feet has been driven and sunk during the past year, no further pay ore has been disclosed. "The main shaft," so the consulting engineer's report remarks, "has been sunk to a depth of 556 feet on the dip of the lode, with no payable values below 165 feet"; and the No. 2 shaft, 514 feet from the other, "has been sunk to a depth of 366 feet (equivalent to 456 feet if compared with the main shaft, owing to the difference in the surface level) with no payable values below 160 feet." Traces of tin are still found, and a continuation of these shafts at a later date is therefore recommended. On the adjoining farm, Vaalwater No. 764, which carries the extension of the Weynek reef, nothing of a payable nature has been discovered, and the property has been abandoned. All this goes to show that the Rooiberg district, like every other, has its inferior as well as its richer areas, although the geological conditions may be generally similar in other respects in each case.

Groenfontein.

The Groenfontein property, the most important tin-bearing ground of the T.C.L., would, of course, have fallen to be considered first if value rather than geological conditions had been the chief consideration. From this point of view there is little new to be said, and interest centres in the fact that "the principal tin-bearing pipe worked by the Zaaiplaats Tin Mining Company, Ltd., is now within 500 feet of the boundary of the lease, and making towards it." Although the statement is not particularly definite as to bearing, it is obvious that the north-western dividing line is referred to. The tendency in that direction, of what may be called the No. 13 fissure, was commented upon in Dr. Merensky's report upon the Zaaiplaats mine, which was published in this journal at the beginning of July last, and since the No. 13 pipe has never been distant 500 feet from the north-eastern dividing line the clear inference is that the workings at the extremity of that pipe are within 500 feet of that portion of the lease ground upon which the T.C.L. slopes in the pegmatite zone are located. The statement that "prospecting is being now carried on on lines of fissuring by means of diamond drill boreholes to locate further payable ore bodies," can only mean that the latter company are endeavouring to pick up the ore bodies which may lie on the north-western extension of the Zaaiplaats fissures. In two out of 35 boreholes put down on the dip of the pegmatite outcrop good values were found, and a vertical shaft which was sunk on the site of one of them disclosed a small pipe in connection with a well-defined fissure which was found to be tin-bearing. Mr. Garrard very rightly draws attention to the importance of this discovery, and thus confirms the view taken of the fissure system on Zaaiplaats itself by Dr. Merensky. The establishing of a connection between pipes and fissures generally in that neighbourhood has led to a diligent search by the T.C.L. for evidences of such fissures in the case of all pipes which have lost their values in depth, and doubtless much useful information will be derived, in one way or another, from the search.

SOUTH AFRICAN FARMERS AND THE TARIFF.

Valuable Lessons from Canada—What South African and Canadian Farmers really Want—Canadian Farmers' Organ invites South African Deputation to Visit the Dominion and Witness the Evils of Protection.

At a moment when a large and representative gathering of farmers from all parts of South Africa is assembled in Johannesburg for the annual show of the Witwatersrand Agricultural Society, the following article from the *Canadian Grain Growers' Guide*, the leading organ of the organised farmers of Canada, is particularly noteworthy:—

"A cable dispatch from Capetown states that the Commerce and Industries Commission appointed some months ago by the Government of South Africa, has presented a report in which heavy increases in the protective tariff are recommended. South Africa, like Canada, has a Manufacturerers' Association, and evidently like their Canadian cousins, the members of this association realise that the easiest way to increase their profits is to secure the protection of a high tariff which will enable them to raise the price of their goods. South African papers containing reports of the sittings of the Commerce and Industries Commission show, however, that the South African Manufacturers' Association is much bolder in its demands than the Canadian Manufacturers' Association. As a result of the demands of the Canadian farmers for lower duties and and for reciprocal free trade with Great Britain and the United States, presented to the Government at Ottawa by 800 farmers from every part of the Dominion in December, 1910, and reaffirmed since by the organised farmers at all their conventions, the Canadian Manufacturers' Association is now on the defensive, and instead of asking for a higher tariff, is devoting all its energies to the effort to maintain the duties at the present level. There is a considerable section of the people of South Africa which is in favour of low tariffs, but unfortunately many of the farmers are supporting the manufacturers in their demands for more protection, under the belief that a higher duty on wheat will be a benefit to themselves. If the South African farmers knew as much about the result of high tariff protection as the farmers of Canada do, their influence would be on the side of Free Trade. At present South Africa is a wheat importing country, and the consequence is that South African farmers are receiving the world's price for their grain plus transportation charges, and the duty, which is now one shilling (24 cents) per 100 pounds under the British Preferential tariff and one shilling and twopence (28 cents) under the general tariff. The farmers of the coastal districts of Cape Colony are now receiving $1.06 to $1.08 per bushel for their wheat, while the grain growers of the interior, being nearer to the mining districts, which are the large consumers of wheat, are receiving considerably more. The wheat production of South Africa has increased much faster than the consumption during recent years, however, and statistics indicate that within a few years there will be a surplus production. When this occurs the position will be reversed, and instead of securing the world's price plus transportation and duty, the South African farmer will have to take the world's price less transportation charges. An import duty for the present increases the price of wheat to the South African farmer, but it is clear that it will cease to be of any advantage whatever as soon as South Africa becomes a wheat exporting country. There is a duty of twelve cents a bushel on wheat entering Canada, but this does not affect the price of wheat in this country, which at the present time ranges from 55 to 96 cents a bushel at Fort William, with a deduction of 6 cents to 18 cents a bushel for the cost of transportation from interior points to the lake front. In order to gain a temporary advantage the South African farmers are consenting to an increase in the protection given to manufacturers, which, in the light of Canadian experience, is astonishing. The manufacturers ask, to take only a few instances, for an increase of duty on general household crockery, sanitary earthenware, etc., from 15 per cent. to 40 per cent.; on school furniture and fittings from 3 per cent. to 25 per cent.; on carts, wagons and other vehicles from 25 per cent. to 35 per cent. or £5 ($25.00) per wheel; on ready-made clothing from 15 per cent. to 33 1-3 per cent., on agricultural implements from 3 per cent. to 15 per cent.; on printed matter from 25 per cent. to 100 per cent.; on flour from 51 cents to 96 cents per 100 pounds, and on leather goods from 15 per cent. to 25 per cent. In addition the manufacturers ask for an export duty on hides and other articles which are at present exported from South Africa. We cannot believe that if the farmers of South Africa realised the burdens which these duties will impose upon them, that they would for one moment consider that they were in the slightest degree compensated for by the doubling of the duty on wheat which they ask for, and which is evidently only a bait held out to them by the manufacturers in order to secure their support. If the farmers will obtain a higher price for their wheat by reason of the duty, it must be plain that the manufacturers will also be able to charge them higher prices for their goods from the same cause, and whereas the farmers will obtain the benefit for a few years only, while South Africa continues to import wheat, the toll which the manufacturers will extort will go on as long as the duties remain. Another surprising feature of the situation is that the South African farmers appear to believe that their interests and those of the millers are indentical. Our own experience proves this is not the case. Farmers are consumers of flour, and though flour should be cheaper in Canada than in any other country in the world, it is actually dearer here in Western Canada, where it is produced, than it is in England, where much of the surplus is sold. The farmers of Canada sell their wheat at export prices, but the millers, being comparatively few in number and thus able to combine to fix prices, base the selling price of flour in Canada not on their own cost of production, but on the price of flour in the United States, with the Canadian import duty added. If the South African farmers assist the manufacturers to secure higher tariffs they will simply be delivering themselves up to the exploitations of the trusts and combines, which always grow up under the protection of a tariff wall. What the farmers of South Africa want, what the farmers of Canada want, and what all producers want is a lower cost of production, cheaper implements, cheaper building material, a lower cost of living—which can be secured under free trade conditions—and cheaper transportation for their produce The Government of South Africa owns practically all the railways in that country, and it would be far better for the South African farmers to make an effort to secure a reduction of freight rates than to play into the hands of the manufacturers by asking for higher duties. We would like to see a deputation of South African farmers visit Canada, and see for themselves the evils of protection before the tariff issue is finally decided in that country. At the same time they would be able to look into our system of handling grain through the elevators, which, though not perfect, is far in advance of their own.

Transvaal G.M. Estates

The General Manager wires that the output for March at the Transvaal Gold Mining Estates is as follows:—Central Mines: Tons crushed, 11,300, yielding 7,865 ozs., valued at £33,012. Elandsdrift Mine: Tons crushed, 625, yielding 1,009 ozs., valued at £4,252. Vaalhoek Mine: Tons crushed, 1,219, yielding 401 ozs., valued at £1,709. Total value of month's output, £39,003; estimated profit for the month, £19,942, to which must be added total gold in reserve declared with this month's output, £5,666, making a total of £25,608. In deference to the wishes expressed by shareholders and others, it has been decided to discontinue the carrying of reserve gold, and the amount in reserve at the end of February has been declared as a special item. In future the actual results will be declared, and shareholders must realise that variations in the amount of profits may occur from month to month. Any circumstances entailing abnormal results will be explained when the monthly profits are declared. Extraordinary expenditure in connection with timber supplies has been met out of working expenses for the month, which have been increased by about £2,000. On the other hand, the profit earned, apart from the inclusion in the output of reserve gold, has been exceptionally high, owing to the fact that the ore stoped in Columbia Hill Mine has been of abnormally high grade.

MACHINERY AT THE JOHANNESBURG SHOW.

Detailed Description of Leading Exhibits—Some Notable Novelties—Labour-saving Devices for the Farm—Cheap and Simple Power Producers—Lighting Installations—A Fine Display of Agricultural Machinery and Implements.

The annual show of the Witwatersrand Agricultural Society, held this week, has proved an unqualified success. The display of machinery shows a big advance on previous years, and the large and increasing number of implements purchased each year from exhibitors speaks volumes as to the progress of the farming industry and the educational value of the exposition. The farmer and small mining man can see all kinds of power-producing plants in action, and can satisfy himself as to the value and cost of power production. Amongst the leading exhibitors in the machinery section is the firm of Orenstein-Arthur Koppel, Ltd. Their exhibit occupies a large space in the open, and a considerable space in one of the sheds, and comprises an all-round display of agricultural machinery by the leading Continental makers, as well as some extremely clever and valuable American inventions. There are beam and disc ploughs, cultivators and harrows made by Messrs. H. Breuer-and Co., Hoechst, at prices which it will puzzle the leading American firms to get down to. All these implements are built in most substantial style, and are sure to be in big demand. Amongst the firm's exhibits of American goods is a cleverly contrived hay stacker, "The Best on Earth," in which the lifting power is supplied by two powerful springs. This is made by Dane and Co., who are also responsible for a hay sweeper, designed to supersede the horse rake. In the exhibit there are combination cultivators and seed drills, separate cultivators and seed drills, and disc ploughs by Rudolph Sach, of Leipsig, all durably built and well finished.

There are in the exhibits several combined mealie husking, shelling, and sacking machines, but none do their work better than that in the O.A.K. exhibit, made by Messrs. Richard Garrett and Sons, Yorkshire. This machine is invaluable and indispensable to any farmer who produces mealies on a big scale. In addition to the combined machine, the firm supply mealie shellers and huskers, to be worked either by hand, horse, or other power. In the shed the more delicate machinery is shown, such as compact mealie meal and flour milling plants. The flour milling plant by Messrs. A. R. Tattersall and Co., London, which requires from four to eight horse-power to operate, and has a capacity of 280 lbs. per hour, can be put down at £385. The mill in the exhibit is worked by a suction gas plant, which is the most economical power producer known. For the mining man the firm stocks all descriptions of iron piping and steel casing, pumps, valves, and fittings, and other mining requisites, a large variety of which are included in the exhibit.

A Local Industry.

In a rather remote position in the machinery section there is an exhibit of bar and rod iron on a large rack, and above the rack there is a calico sign setting forth that the exhibit is from The Union Iron and Steel Works, the only iron and steel works in South Africa. This foundry is at Benoni, and is the property of two energetic East Randites, Messrs. Cartwright and Eaton, who may be destined to become the leading ironmasters of the Sub-Continent in the near future. The exhibit is a small one, but its importance cannot be overlooked. The samples of bar iron and steel are claimed by the firm to be equal in all respects to the best imported article.

Messrs. Harvey and Co.

In this country, which produces mealies in vast quantities, and is destined to assist in supplying a big share of the European wheat needs in the near future, the exhibit of Messrs. Harvey cannot fail to be of interest. They are sole agents for the Gardner Gas Producing Plant, which supplies the power to drive the engine which runs the mealie and wheat milling plants that comprise the bulk of the exhibit. The firm make a speciality of supplying milling plants by the leading European and American makers, and the mills on exhibition range from a capacity of four bags per hour upwards. The firm are sole agents for Messrs. R. G. Ross and Son, Glasgow, sole makers of the Rigby Patent Steam Hammer and Ross's Patent Speed-reducing Gears

Sturrock and Co.

This firm's exhibit consists principally of gas-producing plants, gas engines, and pumps. They are agents for the Campbell Suction Gas Plants, one of which, a most compact and easily worked plant, is on exhibition, and is capable of running a 25-horse-power engine. A large variety of pumps is exhibited, including the Rees-Roturbo Centrifugal Pump, a powerful water lifter for mining or irrigation work.

Vacuum Oil Co.

The "White Rose" exhibit of the Vacuum Oil Co. is one of the handsomest of the show. The White Rose oil and numerous by-products are housed in a circular kiosk arranged in one of the sheds, the roof of the kiosk being constructed of white and sea green muslin, festooned from the centre, and decorated with white roses. Blue Flame Perfection Oil stoves in all sizes are at work, illustrating the perfect combustion of the fuel. Amongst the by-products are Pegasus Petrol, axle grease, lubricating oils, and vaseline. The only article in the exhibit which has no connection with "White Rose Oil" is the "Shell Motor Spirit," made in England, and for which the Vacuum Oil Co. are sole agents.

Stewarts and Lloyds.

This enterprising firm's exhibit consists of windmills, one of which is fitted with a shaft, and can be utilised for supplying power to grind mealies or work a chaff cutter or any similar machine; oil engines in great variety, suction gas plants, centrifugal pumps, piping and casing, belting, shearing machines, and other farming and mining requisites which occupy a prominent place not far from the entrance. The windmills are the well-known Climax and Acme brands, both of which have been proved and tested throughout the world. The firm are sole agents for the Wolseley sheep-shearing machines, which can now be purchased attached to compact little internal combustion engines which generate two horse-power, which is sufficient to drive two machines. The whole outfit, including emery wheel, spare combs and cutters, does not weigh more than 300 lbs., and the approximate cost is not more than £20 per machine. Thus a plant to run two machines would cost the farmer £40 or thereabouts. The Wolsey machines are also attached to hand-driven gears, for both shearing sheep and clipping horses. The Gandy Belting exhibited by the firm is said to hold world's records, and anything which holds records must tend towards reducing costs, whether in agricultural or mining operations.

W. Bain and Co.

This firm exhibits a large range of agricultural implements and fencing materials, including the famous Lochrin droppers and standards, patented many years back, which have not yet been improved upon. A patent safety gate, worked by pulling a rope on either side, is not exactly a new idea, though it may be new to this country. All the same, the contrivance is a very useful one to stock farmers. This firm exhibit a new brand of barbed wire, lighter in gauge than the average, called Barbania.

G. North and Sons.

This exhibit chiefly consists of up-to-date American agricultural and farm machinery made by the Cockshutt Plough Co. (Canada), The Wilkinson Plough Co. (Canada), the McCormick harvesters and other implements, machinery by John Deere, including the famous harvesters and the Columbia ploughs, winners of thirteen firsts and one special prize, horse gears for driving mealie mills, chaff cutters, etc. A very useful small petrol engine, which drives a pump and supplies power for other purposes simultaneously, attracted great attention from both prospectors and farmers. The dry-land farmers found plenty to interest them in the implements made by the Deere and Manson Co., such as soil stirrers and subsoil packers, spring tooth harrows and wrought iron link harrows. The broadcast sowing machine exhibited by this firm is a particularly useful invention, and is so arranged as to get a perfectly even distribution of seed.

Henwood, Son and Soutter, Ltd.

The exhibit of this firm consisted chiefly of imported agricultural implements by John Deere, the Buck Eye, and the Massey-Harris Companies. A useful machine is the mealie cob grinder by W. R. Harrison and Company, Ltd., which is somewhat like a huge sausage machine, and which grinds the corn and stover into a meal. Another useful instrument is the triple-geared cob grinder, a most compact and durable machine, which can be worked by one or two horses. The "New Way" combined pumping and power engine, a water-cooled internal combustion engine, worked in satisfactory style, should prove a useful and serviceable arrangement. The poultry breeders were largely interested in this firm's exhibit of Pearson's incubators, foster mothers, and general requirements.

Griffiths and Co., P.E.

Amongst the exhibits of American agricultural machinery and implements by this firm is an improved and serviceable potato digger, which, judging by its construction, should bring the tubers to the surface with a minimum of damage. The fault with most potato diggers is that they destroy a large number of the potatoes. This implement is made by Parlin and Orendorf, Mass., U.S.A.

Deutz Gas Engine Works.

Messrs. A. Borsig and Co. exhibit gas producer plants and engines from the above works, including the famous Otto gas engine. This firm's exhibits are particularly interesting. Amongst them are electric lighting sets for country hotels, etc., small plants capable of generating 1,000 c.p., driven by paraffin engines. It is estimated that the cost of producing 800 c.p. for three hours will work out at 1s. 6d. These plants cost from £70 to £100. The exhibit also contained the four-stage "Crystal" centrifugal pump, direct coupled with an electromoter which draws water automatically from a well. It is so arranged that as soon as the pump is started the tanks are filled with water and the air contained therein is compressed. As soon as this pressure reaches four atmospheres the pressure regulator interrupts the electric current and stops the pump. When the water is tapped off and the pressure is reduced to about two and a half atmospheres, the pressure regulator completes the circuit again and the pump starts working. Such an installation is invaluable in country houses as a protection against fire, and even on the mines such an installation would afford more security than any other fire-fighting appliance known.

Bartle and Co.

This firm's display of the famous "Overland" motor-cars was one of the features of the show, and the prices, ranging from £300 for a handsome two-seater to £415 for a leather-hooded four-seater powerful car, almost defy competition.

Williams, Hunt and Co.

This exhibit consisted of the leading makes of motor cycles, the machine which is proving more and more useful to the farmer and prospector each year, for they are now durable, reliable, and simple in construction. Amongst the makes in the exhibit were the Scott, Bat, Precision, Indian, Abingdon, and Hazelwood.

Moorhouse, Ltd.

Included in the above firm's exhibit was the Detroit combination tool, a description of which appeared in this journal some time back. Needless to say that this useful tool, which comprises forge, anvil, vice, pipe vice, emery wheel, and drill press all in one, was naturally an object of interest to the prospector, small mining man, and farmer, for though heavy enough to stand rough work, the whole affair weighs less than 200 lbs.

Malcomess and Co., Ltd.

The chief feature of the large exhibit of agricultural and other appliances exhibited by Messrs. Malcomess and Co., Ltd., was the Stewart patent sheep-shearing machine, built by the Chicago Flexible Shafting Co. It is worked by a 2 h.p. petrol engine. The only real difference between the Stewart and the Wolsey is in the shaft, which differs from the shaft of the latter machine in that it is in three pieces, connected by ball joints, whereas the Wolsey shaft is one flexible piece of gut cord. The Stewart machine does its work satisfactorily.

T. W. Beckett and Co.

This well-known firm of agricultural providers showed a large range of English and American machinery and implements, including a combined mealie, husker, sheller, and bagger, by Ransomes, Sims and Jeffries.

D. Hockey and Co., East London.

This exhibit consisted of traction and power engines and mealie husking, shelling, and bagging plants, by Marshall, Sims and Co.

Other Machinery Exhibits.

It is hoped in our next issue to give a further and more detailed account of some of the exhibits in this section.

Rooiberg Minerals Development Co.

The following are the particulars of the estimated result of operations on this company's property for the month of March:—Stamps, 10; days run, 30; tons milled, 1,593 short tons; concentrates, 62 long tons; average assay value metallic tin, 70 per cent.; net capital expenditure, £7,792; estimated profit, £2,884; adjustments due to fluctuations in the price of tin to be added to estimated profit in respect of November shipments, £229; gross profit for month, £3,113. The concentrates in reserve at the 31st March amounted to 17 tons (2,240 lbs.) of the net value of £1,616.

The Phœnix Mine has commenced working again, and will soon be in full swing, says the *Greytown Gazette*. We hope to publish some interesting information in regard to this mine in an early issue.

Three Sisters G.M. Co.

During the five months' treatment of accumulated tailings on the above mine, the results were as follow:—3,758 tons treated by cyanide, from which 560 ozs. bullion recovered.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

RAND METALLURGY: A NEW GUIDE AND REVIEW.

A Group of Leading Local Metallurgists Describe Rand Practice.

"A Text-Book of Rand Metallurgical Practice," designed as a "working tool" and practical guide for metallurgists upon the Witwatersrand and other similar fields.

The appearance of a book upon the metallurgical practice of the Rand by a group of leading metallurgists whose experience and ability make them especially competent to deal with the subject is an occurrence which serves to draw attention to the fact that Rand metallurgy has reached a stage when the main principles upon which it is based have taken definite and more or less permanent shape. After some twenty-five years of experiment and improvement a degree of technical refinement has been attained which may be susceptible of betterment to some extent, but which is as much as seems economically possible as far as present-day knowledge goes. Methods have become largely stereotyped, and such modifications as appear likely to be made, in the immediate future, at any rate, are mainly such as will tend to cheapen the cost of using these methods rather than to alter the processes themselves. Metallurgists feel justified, therefore, in placing upon record the conclusions to which they have come, and the means they have found best suited to solve ore treatment problems, not only with the object of guiding those who may have similar problems to deal with elsewhere, but for to instruct those who are actually engaged in the operations described. As the preface to the book informs us, "The work has been written by a body of technical men actively engaged in current metallurgical practice upon the Witwatersrand. Each has based his treatment of the special branch of the subject with which he has dealt upon the experience gained and the investigations made during the course of his daily duties. The authors have endeavoured to provide at once a text-book of Rand metallurgy, a "working tool" for those concerned in each branch of ore reduction and treatment practice, and a guide to fellow-workers operating under similar conditions in other parts of the world." It is only necessary to mention the names of the metallurgists who have collaborated in the undertaking to assure readers that it is at once accurate, comprehensive, interesting, and useful, and, in a word, admirably adapted to the purpose set before them by the authors. They are Messrs. Jas. E. Thomas, G. O. Smart, W. R. Dowling, H. A. White, E. H. Johnson, W. A. Caldecott, A. McA. Johnston, and C. O. Schmitt.

It will be at once apparent to those who scan this list that the technical ability of the Consolidated Goldfields Group is somewhat predominant, and as one reads the book itself the instances and methods referred to frequently draw attention to this circumstance. It is, nevertheless, no demerit, for the metallurgists and engineers of that group have for some years been in the van of scientific research relating to the chemical and mechanical processes of ore treatment, and have been distinguished by the number and value of their contributions to the transactions of technical societies both on the Rand and elsewhere. An interesting introductory chapter is contributed by Mr. Ralph Stokes. The order followed by the authors is that suggested by the successive operations through which the ore passes in its progress from the shaft to the tailings dump, and thus the first chapter of a purely technical character is that upon sorting and breaking, by Mr. Jas. E. Thomas, reduction works manager of the Simmer Deep-Jupiter Joint Plant. As a general survey of the schemes in common use the chapter is a useful one, but one feels that a great deal more might have been made of the subject; for instance, by giving drawings showing the arrangement, not necessarily in great detail, of some representative plant. There are several which would have served the purpose admirably. The drawings given are merely diagramatic, and do not embody some prominent features to be seen in a few of the more recent plants.

The contribution on stamp-milling by the late Mr. G. O. Smart contains a great deal of information in a comparatively small compass, and contains a number of drawings which are new and well chosen. Tube-milling is well dealt with by Mr. W. R. Dowling, formerly of the Simmer Deep-Jupiter, and now of the Robinson Deep. As it is a subject which has received a great deal of his attention, we find it well illustrated and accompanied by some useful tabular statements. A few of the figures have already appeared in earlier issues of the Journal of the Chemical, Metallurgical and Mining Society in connection with his well-known paper on "The Amalgamation of Gold in Banket Ore," but the matter is generally new and well up to date. One misses a reference to the later information on the subject, however, such as that which has been brought to light in the discussion on Mr. Standish Ball's recent paper at the meetings of the Institution of Mining and Metallurgy. The latest reference is that to Mr. C. O. Schmitt's paper on "Future economies in Rand reduction plants," and obviously the exigencies of getting the volume through the press has prevented a review of some of the very newest data. In the chapter on the "Treatment of Sand," by Mr. Jas. E. Thomas, we have a summary of the sand cyaniding process as practised on the Rand, which is largely original, both in the matter of text and diagrams, although some familiar tables and illustrations are included from the transactions of the C.M. and M. Society, mainly those relating to the Caldecott filter table. It would have been difficult to do without them, because they were prepared at considerable trouble for the special purpose of elucidating the working of the apparatus, and it would probably be impossible to make new drawings which would serve the purpose better. It is, indeed, an excellent idea to reproduce some of the more important earlier technical papers of the joint authors, since they present in a handy form the data of some valuable investigations which would otherwise have to be searched for in divers other volumes.

Messrs. H. A. White, of the Princess Estate, and W. R. Dowling have collaborated in the chapters on "Slime," under the headings of "General Considerations" by the former, and "Works Practice" by the latter. The contributions are in every way admirable, and deal worthily with a subject which is of no small importance, not only on the Rand, but in other parts. Mr. E. H. Johnson deals adequately with the subject of "Precipitation," and is responsible for another chapter on "Clean-up and Smelting." A useful and fairly lengthy description of assaying methods is given by Mr. A. McArthur Johnston, as well as one upon testing, and these two chapters form perhaps the most useful in the book. "The Chemistry of Banket Ore Treatment," by Dr. W. A. Caldecott, deals with a subject that no one is better qualified to discuss than its author, and this is followed by a series of tables which will be found extremely valuable to metallurgists. These have been compiled by Messrs. W. A. Caldecott and H. A. White jointly, and include pretty well everything in the tabular form that is worth including in a text-book of the kind. A copious index concludes the volume, but we cannot omit a reference to the abundant bibliography which accompanies each chapter. In itself this portion of the work is of no small value, and only a brief inspection suffices to show that it is a fairly exhaustive one.

It is perhaps hardly necessary to say anything for the special purpose of recommending the text-book to those who are interested in any way in Rand metallurgy. The names of the authors, as we have already remarked, and the new and original character of the book generally, are in them selves a sufficient recommendation. We have only to add that the price of the volume is 25s., post free 26s., and it is to be obtained from Mr. Fred Rowland, Secretary of the Chemical, Metallurgical and Mining Society, at the Transvaal School of Mines Buildings. The second volume of the work, which deals with "Metallurgical Construction Work," is now in the press, and is by Mr. C. O. Schmitt, who was for many years with the Consolidated Gold Fields. We regret to add that Mr. G. O. Smart, one of the authors of the first volume, died since the work went to press.

EXPERIMENTS ON THE RATE OF BURNING OF FUSE.

Conclusions Concerning the Effects of Pressure, Temperature, Moisture and Mechanical Injury—Importance of Appreciating the Value of Variations in Burning.

[By Walter O. Snelling and Willard C. Cope.]*

Miners' fuse known also as "safety fuse," "running fuse" and "Bickford fuse," consists essentially of a core of gunpowder, surrounded by protective wrappings or coatings. It is used in blasting as a gunpowder "train" for transmitting ignition to the charge of explosive, and its purpose is to provide a time interval between the lighting of a "shot" and the explosion of the charge

Such fuse best fulfills its purpose when its rate of burning is uniform, so that the interval between the moment of lighting the "shot" and the moment at which the "shot" explodes is definite for any given kind and length of fuse. In mining operations it is assumed that the fuse used burns at a regular and uniform rate, and, believing this, the miner in his daily work cuts off such lengths of fuse as should give the particular time intervals desired.

There are, however, conditions that cause variations in the rate of burning of fuse, some causing a marked retardation and others causing a decided acceleration. Hence it has seemed necessary to investigate the conditions that bring about these variations, since any marked change in the rate of burning of fuse can cause an accident.

For instance, where a number of shots are to be fired in one round it is not always possible to determine by the usual method of counting that every shot has fired. Hence, should one piece of fuse have been subjected to such conditions as produce a retardation in its rate of burning, the miner may go back to the shot before all the holes have fired and encounter an explosion as he nears the face. On the other hand, should conditions be such as to cause an increase in the rate of burning of one piece of fuse out of a number used in a single round of holes, it may be possible for this piece of fuse to bring about an explosion before the miner has been able to light all of the other pieces and reach a point of safety.

It will thus be seen that either retardation or acceleration in the rate of burning of fuse can readily become the cause of accident, and accordingly the study of the conditions under which the rate of burning of fuse is so changed as to cause the fuse to burn more rapidly or more slowly becomes of particular importance.

Miners have frequently noticed that fuse, when surrounded by very dense stemming material, as in a hole that has been firmly tamped, burns faster than it should. In this case the dense and impermeable stemming prevents the free escape of the gases from the powder, and so compresses them in their attempt to escape as to bring about a decided quickening in the rate of burning. As the use of firm stemming is nearly always desirable, one can readily see that information as to the degree of quickening in the rate of burning of fuse under these conditions is essential in order that the miner may in such cases know what additional length of fuse is necessary to provide for the increased rate of burning.

Retardation in the rate of burning of fuse is a serious fault. Cases are known, though fortunately very few, in which a piece of fuse has seemingly stopped burning, and yet after an interval of one or more hours has brought about the explosion of the charge to which it was attached. Cases of this sort never happen with fuse that is in good condition, but may sometimes happen when fuse is of poor manufacture or has been subjected to unfavourable conditions of moisture or temperature.

The conditions that are believed to be most active in bringing about either a retardation or an acceleration in the rate of burning of time fuse have been investigated experimentally, and the results that have been obtained are classified under effects due to: (a) Pressure; (b) temperature; (c) moisture; (d) mechanical injury.

It is important that time fuse should have a uniform rate of burning, and in almost all blasting operations the fuse that is used is assumed to burn in a regular and uniform manner. When fuse has been subjected to such conditions as to produce acceleration or retardation in its rate of burning it becomes dangerous. Acceleration of the rate of burning increases the liability of a shot going off before the miner has left the face; retardation increases the chance of the flame in the fuse progressing so slowly that the miner will be injured by a delayed shot when he returns to the working face. All conditions that bring about any marked change in the rate of burning of fuse are dangerous, and from a study of the list of accidents in mines and quarries each year injury and loss of life are seemingly often brought about by such conditions.

Under ordinary conditions nearly all types of fuse show great uniformity in their rate of burning. Practically all types of fuse examined in connection with the preparation of this report had a total variation in their rate of burning under normal conditions of less than 20 per cent., and all would have been passed under the allowance of "no variation greater than 10 per cent. above or 10 per cent. below the average rate of burning."

Under the influence of pressure practically all types of fuse are subject to wide variation in their rate of burning. Such pressure as can readily be produced by the confinements of the gases evolved by the burning fuse itself is sufficient to increase the normal rate of burning from 92½ seconds per meter (28.2 seconds per foot) to 21 seconds per meter (6.4 seconds per foot). Thus, even confinement will cause fuse to burn from three to four times as rapidly as its normal rate. In experiments made with fuse confined by stemming of various kinds wide variations in the rate of burning were noted, and whenever lengths of fuse are confined by stemming or other materials impervious to gas, a sufficient length of the fuse should be used to allow for the increased rate of burning due to the pressure produced by the evolved gases.

High temperature causes a marked retardation in the rate of burning of fuse, and storage for even a short period of time near boilers, or whenever the temperature may be high, is sufficient either to cause "misfires" or to retard the rate of burning of the fuse so much as to greatly increase the liability of "holdbacks," delayed shots, etc. It is probable that many of the difficulties that are sometimes encountered in regard to fuse burning too slowly and causing delayed shots are due, in part at least, to such fuse having been kept in too warm a place. Fuse that is not intended for use in wet places (cotton fuse, etc.), does not suffer marked change in its normal rate of burning by reason of the effect of high temperatures, whereas the more completely waterproofed types of fuse show increasingly great effects from heat. Even exposure to comparatively low temperatures for considerable lengths of time causes marked retardation in the rate of burning of such fuse, and exposure to a fairly high temperature for even a short length of time may cause certain types of fuse to burn from three to five times as slowly as their usual rate. To insure the best results, fuse should always be protected from extremes of temperature.

Climatic conditions affect to a considerable extent the rate of burning of the less waterproof types of fuse. Damp fuse burns more slowly than normal fuse, and fuse that has been wet and then thoroughly dried tends to burn at a rather slow rate, and may even cause delayed shots by smoldering for a considerable time. Fuse containing several wrappings of tape saturated with tar or asphalt resists moisture to a considerable extent, and may be used for firing shots under water, provided the fuse is not allowed to remain too long a time in contact with water before the shot is fired.

It is, of course, evident that when these waterproofed types of fuse do become wet, whether through storage for a long time in a damp place or through exposure to water after the protecting layers of asphalte or gutta-percha are mechanically abraded or injured in any other way, they are more difficult to dry out than are other types of fuse, and are more liable to burn at a rate slower than the normal rate.

Fuse that has been subjected to actual mechanical injury, particularly to hammering or pounding, or the blows of falling rock, etc., has a greatly increased rate of burning, and sometimes burns so rapidly as to be almost instantaneous in its action. The mere bending, coiling and twisting of fuse, such as would be brought about by forcibly placing within a bore a length of fuse considerably greater than the depth of the bore hole, does not produce any marked change in the rate of burning, but pounding or direct abrasion of fuse greatly increases that rate. Fuse that has been injured by severe abrasion or by too great pressure from any cause should not be used in any work where adjustment of the rate of burning is desired.

As a final summary it may be stated that ordinary fuse may under some conditions burn as fast as three seconds per meter (one second per foot), and under other conditions it may burn as slowly as 745 seconds per meter (227 seconds per foot). The former rate is more than 200 times as fast as the latter, and each is widely removed from the normal rate of burning of similar brands of fuse. Hence, the condition and past history of any roll of fuse is an important matter, and in mining and blasting operations the safety of the miner demands that only fuse that has been carefully stored and kept from unfavourable conditions shall be used.

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* Extracts from Technical Paper No. 6, U.S. Bureau of Mines, 1812.

THE YEAR WITH THE APEX GOLD AND COAL MINES.

New Dressing and Screening Plant at the Coal Mine—Curtailed Operations at the Gold Section—Shaft Sinking Stopped and Efforts Concentrated on Increasing Ore Reserves.

The Apex Mines earned a net profit from the coal section of £44,189 16s. 4d., which, together with the balance brought forward from the previous year, totals £58,824 1s. 9d., appropriated as follows:—Dividends Nos. 14 and 15, declared in respect of profits from coal winning, £30,000; profits tax, £2,790; directors' extra remuneration in terms of Articles of Association, £1,500; expenditure on capital account out of profits (coal section), £14,326 18s. 10d.; balance carried forward to the current year, £10,207 2s. 11d.; total, £58,824 1s. 9d. At the close of the year, the unexpended capital amounted to £100,093 17s. 4d. A certain amount of this is locked up in necessary shares in other companies, in freehold cottages in Benoni Township, etc., not immediately realisable, and the actual cash available for the further exploitation of the gold section at the close of the year amounted to about £80,000. The directors' report states that it will be necessary at an early date to consider arrangements for financing the company in order to bring it to the producing stage. The question of the amount of additional capital required is at present under the consideration of the Consulting Engineer. At the gold section the surface equipment of the South or Dip Shaft was completed in the early part of the year. Sinking this shaft was suspended for the time being in order that the available funds might be utilised in opening up the mine at the North Shaft as far as possible. The net capital expenditure for the year on account of the gold section amounted to £166,482 4s. 11d., distributed as follows:—Shafts, £21,795 10s. 1d.; development, £93,077 4s. 8d.; conveyors underground, £12,030 12s. 1d.; permanent pumping scheme £6,821 5s. 7d.; South Shaft equipment, £5,373 1s. 7d.; air compressor and steaming station (North Shaft), £3,687 5s. 9d.; electric plant, £7,029 15s. 8d.; Kleinfontein Group central administration, £1,124 15s. 10d.; Kleinfontein Power Association, £1,859 9s. 2d.; general equipment, £6,190 5s. 7d.; general expenditure, £7,492 18s. 11d.; total, £166,482 4s. 11d. The Main Incline Shaft has been sunk to a total depth of 2,195 feet. Development to 31st December, 1911, exposed:—Payable ore, 258,060 tons; 76·5 per cent.; milling width, 54·42 inches; milling value, 6·5 dwts.; unpayable ore, 79,199 tons; 23·5 per cent.; milling width, 46·75 inches; milling value, 2·89 dwts. Since the close of the year Mr. W. G. Holford has resigned his appointment as manager of this section, and Mr. E. H. Bulman, late manager of the New Goch Mines, has been appointed by the Board to fill the vacancy. In his annual report on the coal section, Mr. E. J. Way, Consulting Engineer, writes:—The principal features of the year's work have been the taking into commission at the beginning of March of the new shaft with new coal dressing and screening plant, and the erection during September of an additional screening plant to meet the demand for a fine coal (known as "Pearls"), which up to the time of the erection of this additional plant had been thrown on the waste dump. I am able to state that the dressing and screening plant have been running most successfully and have given entire satisfaction. Development continued to give satisfactory results during the year.

Consulting Engineer's Report.

The Consulting Engineer, Mr. E. J. Way, writes as follows, regarding the gold section: Development and shaft sinking were adversely affected in the early part of the year, owing partly to the large quantity of water which had to be dealt with, and partly to the curtailment of power due to the failure of certain parts of the 1,000 h.p. Dank's boiler at the north shaft steaming station, and to the intermittent nature of the power supply obtained from outside sources. These difficulties have now been entirely overcome. The completion of the permanent pumping plant at the bottom of the north vertical shaft—consisting of two 15,000 and one 30,000 gallons per hour three-throw ram pumps—and the construction and equipment of a pump station and sump on the 3rd level crosscut have entirely relieved the water position. The power shortage is now overcome, as the Dank's boiler is working satisfactorily and all outside power is being obtained from the Kleinfontein Power Association. Both the pump equipment and the power supply are now ample to meet the present requirements of the mine and to admit of normal sinking and development being carried on in the future. Development during the year has been satisfactory. The opinion I expressed in my last report, namely, that the area of broken ground surrounding the north vertical shaft showed signs of being passed through in 1909, has proved well founded. During the year under review the development eastwards of the disturbed area has opened up a continuance of the reef zone on the 2nd, 3rd and 4th levels, whilst westwards of the disturbed area a large reef-bearing area has been exploited on the O.1, intermediate 1st and 2nd levels, exposing very satisfactory results in the hanging-wall section of the reef. This position is reflected in the actual ore developed during the year, as the tonnage developments to date show a percentage of 76.5 payable, averaging 6.5 dwts. over a milling width of 54.42 inches. The development results during the year, when taken in conjunction with the results from the neighbouring mining properties and with the data originally obtained from boreholes in the mynpacht area, confirm me in the opinion I expressed in my last year's report that development over a large area should expose conditions approximating closely to those obtaining in the Brakpan Mines. The first 1,000 feet of the belt equipment in the main incline shaft, namely, the two sections down to the plane of the 2nd level ore bin has, since the date of your manager's report, been tested, and, I am able to state, has worked admirably and has effected already very considerable economies, both as regards power consumed and native labour employed, in the handling of rock between the storage bins at the levels and the main ore bin at the vertical shaft. Satisfactory progress has been made with the sinking of the main incline shaft, and as fresh development faces are opened up a progressive increase in the monthly development footage and in the tonnages of ore exposed may be expected. South section.—The steaming station, compressor plant, and hauling engines at the south vertical shaft were completed early in the year, and together with the steel headgear are in excellent order. Everything is now in readiness to enable rapid and continuous sinking and development to be carried on from this shaft. General.—Since the date of your manager's report the sinking of the main incline shaft has been stopped, the expressed policy of the Board being to use the remaining available funds for the purpose of developing the largest tonnage of ore possible. It is regrettable from the technical standpoint that, in addition to the cessation of operations at the south vertical shaft, it should be necessary to stop sinking in the main incline shaft. Technically the position is quite unsound, and must eventually seriously delay the bringing of your property to the producing stage. The main reef was intersected in the crosscut from the 4th level station towards the end of February, and assayed 71.55 dwts. over a reef width of 9 inches. The small amount of driving which has been done on this reef on the 4th level up to the time of writing this report shows that this value is being maintained. This intersection of highly payable main reef in the 4th level crosscut is most encouraging, as it goes to prove that the rich ore shoot encountered in the main incline shaft between the 2nd and 3rd levels is so far continuous. The value of this rich shoot has been largely discounted in the past when calculating the value of ore reserves, as it was felt that it would not be advisable to attach too much importance to this very rich shoot until more definite information had been ascertained as to its permanence or otherwise. The development proceeding in nearly every face at the present time is payable, and were funds available for the sinking of the main incline and south shafts your property would be rapidly brought into a position to produce gold.

Manager's Report.

The late manager, Mr. W. G. Holford, writes as follows, *inter alia*: The tonnage developments to date thus show a percentage of 76.5 per cent. payable and 23.5 per cent. unpayable. As the area in which this development has taken place represents approximately only 3.22 per cent. of the entire mining area of the company the above payable tonnage, representing as it does only that portion of the above area which has been fully developed, must be considered satisfactory. The total cost of development, excluding the sinking of the main incline shaft, amounted to £93,077 4s. 8d. This is equivalent to £6 9s. 9d. per foot, or, if the half-yearly aggregates are taken, to £7 7s. 2d. for the first six months of the year, and to £5 14s. 8d. for the last six months of the year. These figures include the *pro rata* share of mine drainage, amounting to 17s. per foot for the year, or if the half-yearly aggregates are taken, as before, to £1 6s. 9d. for the period January to June, and 8s. 7d. for the remaining six months of the year. The main incline shaft sinking costs were as follows:—Feet sunk, 1,369; total cost, £21,795 10s. 1d.; cost per foot, £15 18s. 5d. These figures include the *pro rata* share of mine drainage, amounting to £1 16s. 5d. per foot for the year. Although the past year's development work has been expensive, there should be a tendency to improve in the immediate future, as with the steady sinking of the main incline shaft more faces will become available at which to attack the reef in close proximity to the main belt haulage, thus relieving the congestion caused by the handling of rock in a confined area, which has been one of the principal causes of the high development costs during the year. General.—Progress in the early part of the year reflects the effect of the water difficulty and of the curtailment of power at the steaming station, whilst late delivery of machinery has also considerably interfered with anticipations forecasted as to the progress of the work. It is much to be regretted that the carrying out of the full policy of the company, which included the sinking of the south shaft, was inadmissible, but it is very satisfactory to note that the past year's development, in spite of all these drawbacks, gives promise of the company's mining area participating largely in the payable areas of the eastern section of the Witwatersrand.

MINES OF THE PILGRIMS REST DISTRICT.

No. 1.—Mali Dyke.

[By Arthur W. Hendren Frost, F.R.C.I.]

The Pilgrims Rest Gold Fields are fast taking their proper place in the South African mining world. For many years these important fields, only second to the Rand, have been allowed to lie more or less dormant. Surface scratchings, with here and there a more or less serious attempt to open up a mine, are various points in its history, often attended by partial failure, owing to lack of sufficient knowledge or capital. This era is fast passing away, and we have on all sides signs of activity, pointing to a renewed life, which is, as far as one can humanly judge, beyond our ken. Very little has been done to prove the reefs lying below the Beta horizon. So that, even now, the potentialities of these fields are in the future. It is well to realise this, for these fields are old now, and some capitalists view with caution propositions coming from such districts which have been at work for some years. It is my endeavour, therefore, in view of this fact, to show the readers of the *Mining Journal* that we are as yet in our infancy; that there are numerous possibilities in our fields to justify the claims so often made now as to the value of the industry here. This month, by the courtesy of Mr. Froude, the manager of Mali Dyke, it was my pleasure to spend a day on this property. The surface of the property was first worked by the alluvial diggers in 1872. In 1909 claims were acquired by Dr. Aymard, who later on took into partnership Mr. Gemmell. In August, 1910, Mr. Laurie Hamilton, consulting engineer for the S.E. Africa, Ltd., who hold properties in South-East Africa and elsewhere, was in the district and made an examination of this property, with the result that the above company took up an option for two years, some twelve months of which have passed by. The reef is a true quartz reef, pyritic in depth, showing both copper and iron pyrites, the latter carrying gold in large quantities; the former, though rich in copper, being only slightly auriferous. The reefs occur in a large diabase dyke, which stretches for many miles over Driekop, Graskop, Mac Mac, and other farms. There are three reefs, two occurring within the dyke and one at the contact of the dyke and the formation. The reefs, as far as disclosed up to the present, are unique, being related to none of the well known reefs in the district. The development, previous to the option, showed extremely good values, and it was only lack of capital to cope with heavy water in depth that debarred the owners from carrying on work. I will now deal simply with the present development by the option-holders, which takes in certain work done by Mr. Gemmell on their behalf and while acting in the capacity of manager for them. The results of the sampling done by Mr. Froude, when he took charge, tallied with the sampling previously carried out and has been confirmed by the trial crushings, with which I will deal later. The adit B totals, with crosscuts, 2,000 feet driven on the east and west reefs. This is the drainage adit of the mine at present, and owing to the formation not being porous, it is hoped to drain most of the water out through this drive, which at present carries a large volume. The present main shaft is down 160 feet, with some 200 feet of driving, carried out at that depth. The west reef is now being opened up at the lower level, where it is expected to encounter good values on reaching the zone when gold values were exposed by the upper levels in B adit. A crosscut now being carried across the dyke, from the bottom of this shaft, has opened up a reef already 7 feet wide, the full width not having yet been exposed. This reef is higly pyritic, and I understand is carrying values across the full width so far exposed. A drive going down to connect with the drive at the bottom of the main shaft is giving values up to 100 dwts. The east reef, which opened up from B adit, has exposed highly payable value over a good stoping width, assaying from 30 to 50 dwts. over a section 600 feet in length. Some 1,000 feet of driving has been done on the west reef. This reef is more irregular and patchy than the east, but is extremely rich in places, assays up to over 30 ozs. to the ton having been obtained. A prospecting adit has exposed the reefs showing good values some 1,100 feet south of B adit, while at a lower level, still further south, another adit has been driven a distance of 650 feet, where it is expected to strike the dyke with another 300 feet of driving, when the reef in this section of the property should be exposed. Two trial crushings on the rock from the development drives have been carried out. The first gave bullion to the value of £2 7s. 6d. per ton crushed. The second crushing was practically identical, working out at £2 7s. per ton crushed. It would almost appear that sufficient tonnage and values are now disclosed to pay back the cost of the property to the option holders, and there is yet another year of the option to run. Whether the company will take over the property it is not in my province or knowledge to say, but it would seem extremely likely. They own 52 claims acquired from Messrs. Mockett & Spandow, which is known as the Extension, and on which the low level adit is being driven. They also have options covering some 130 claims along the strike of the dyke. With the railway coming to their door almost, working costs will be considerably reduced. In the event of the company exercising their option a new plant of larger capacity, specially designed to deal with the pyritic ore encountered in depth, will be erected in place of the present small mill and cyanide plant. The writer would desire to place on record the unfailing courtesy of the manager, Mr. Froude, who took him over the mine, and the kindness of Mr. Rundall, the company's engineer, in placing such valuable information at his disposal.

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THE YEAR WITH THE NEW KLEINFONTEIN.

Satisfactory Development in the Orient Claims—Improved Values in the Central Section—Unsatisfactory Development in the Western Section Leaves Ore Reserves Unaffected.

IN 1911 the New Kleinfontein earned a working profit of £245,763 13s. This, with the balance of £5,569 15s. 6d. brought forward, totalled £251,333 8s. 6d., which amount has been dealt with as follows:—Dividends to shareholders, £169,750; Government taxes, £18,920 13s. 9d.; amount of French fiscal tax written off as irrecoverable, £2,642 11s. 8d.; contribution to Government Miners' Phthisis Fund, £551 4s. 6d.; directors' additional remuneration in terms of Articles of Association, £2,000; interest on loan from Standard Bank, £4,126 13s. 1d.; expenditure on fixed assets, £27,031 16s. 9d.; written off development account, £11,557 9s. 4d.; balance carried to 1912 accounts, £14,752 19s. 5d. During the year certain changes were made in the methods of accounting, under which the general expenditure at the mine, which had hitherto been distributed, is now treated with head office charges as a separate item of expenditure. This resulted in an increase of 9·3d. per ton in the general charges, the other accounts receiving the benefit of the change. The basis of charging development account was also revised, and, at the close of the year, in order to make the revised arrangement retrospective to 1st January, it was decided to write off £11,557 from development, in addition to the amount charged monthly to working costs on this account. The net revenue, working costs and profit per ton milled for the years 1910 and 1911 were as follows: 1910—Revenue, 28s. 0·3d.; working costs, 16s. 0·8d.; profit 11s. 11·5d. 1911—Revenue, 29s. 5·3d.; working costs, 18s. 6·6d.; profit, 10s. 10·7d. Thus, while the recovery, including the gold reserve account, which has been taken into the year's revenue, was 1s. 5d. higher, the expenses were 2s. 5·8d. higher, showing a decreased profit of 1s. 0·8d. per ton milled. The increased cost of working is mainly attributable to the increased costs of native labour, the revision of the basis on which development and shaft sinking charges are made, and to maintenance charges. The net expenditure on capital account for the year amounted to £90,360 17s. 9d., analysed as follows:—Excess development, £18,223 12s. 11d.; shaft sinking, £26,093 7s. 2d.; increase in reduction plant, £15,458 2s. 9d.; electric pumps, £8,052 8s. 11d.; electric winders, £4,113 12s. 10d.; sundry electric machinery, £6,753 12s. 9d.; 25 drill compressor and boiler, £2,963 3s. 5d.; sundry equipment, £4,312 15s. 6d.; compound, £2,576 1s. 3d.; Kleinfontein Power Association, £689 2s. 6d.; Kleinfontein group, central administration, £1,124 17s. 9d.; total, £90,360 17s. 9d. The Bank loan at the close of the year stood at £174,000. The estimated expenditure on capital account for the year 1912 amounts to £114,251. It is proposed to meet a portion of this expenditure out of profits. The extension to the reduction works is well in hand. The plant should be in a position to deal with increased tonnage by April, and from that time on the capacity will be gradually increased until the maximum is attained, which should be in the month of June. The tonnage milled was 451,145 tons, showing a decrease of 15,737 tons as compared with the previous year. The Orient Section is being opened up as expeditiously as possible. The workings from the Eastern Subsidiary Shaft have already penetrated the western end of this section, and developments are giving very satisfactory results. Driving is also proceeding west from the workings of the New Modderfontein Company at the 9th and 11th levels.

ORE RESERVES.

The following comparison of the ore reserves at the 31st December, 1910, and 31st December, 1911, is subject to the Manager's report thereon:—31st December, 1910: Payable: 1,057,397 tons, 7·47 dwts., 39·57 mill width inches; unpayable, 340,015 tons, 3·33 dwts., 38·66 mill width inches; total, 1,397,412 tons, 6·46 dwts., 39·35 mill width inches. 31st December, 1911: Payable, 1,146,531 tons, 7·496 dwts., 43·94 mill width inches; unpayable, 460,484 tons, 3·676 dwts.; 40·93 mill width inches; total, 1,607,015 tons, 6·40 dwts., 43·068 mill width inches. The Manager states that while the average grade of development for the year has been 6·34 dwts., and the grade to mill 7·57 dwts., a large amount of high grade ore, much of which did not figure in the ore reserves, has been reclaimed from old stopes, hence the total value of the reserves as compared with that of the previous year is practically unaltered. At the close of the year the directors, on the recommendation of the London Committee, decided to discontinue the practice of carrying gold in reserve, and, in consequence, the reserve at 31st December, 1911, amounting to 1,866 fine ounces, valued at £7,926, was brought into the year's revenue account. The reserve gold was not included in the quarterly or monthly statements to the shareholders for the year.

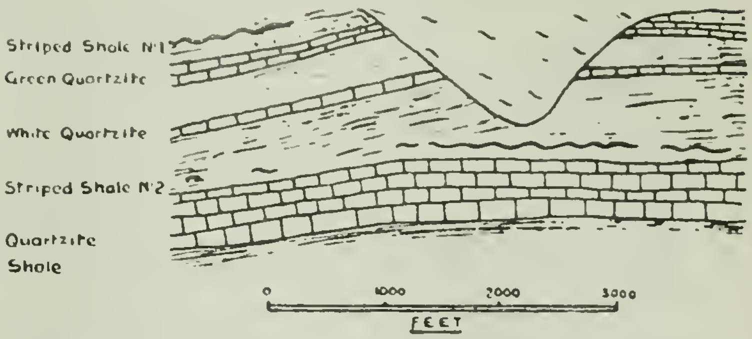
CONSULTING ENGINEER'S ANNUAL REPORT.

In his annual report for the year 1911, Mr. E. J. Way, the Consulting Engineer, writes:—I have carefully perused the report submitted by your manager, Mr. R. M. Torin, on the operations carried out during the year ended 31st December, 1911, and herewith confirm the statements made therein. The principal features of the year's operations are as follows:—(1) The satisfactory development in the Orient Claims; (2) the appreciation in the value of the ore developed in the Central Section during the year under review as compared with the ore developed in this section during 1910; (3) the depreciation in value of the ore developed in the Western Section during the year under review as compared with the ore developed in this section during 1910; (4) the fact that in spite of the large tonnage of low grade ore developed in the Western Section, the value of the ore reserves has not depreciated. Dealing with these features in detail:—(1) The satisfactory development in the Orient Claims. For mining and geological reasons the Orient Claims have been divided into two sections, one of which is known as the Main Orient Section and will be developed from the Orient vertical shaft, whilst the other, which is now included in the eastern section of New Kleinfontein, will be developed from the New Kleinfontein eastern subsidiary shaft. During the period under review development has been restricted to the south reef only in the Main Orient section, as the vertical shaft has not yet reached the plane of the Main Reef in this section, and to the Main Reef and Main Reef Leader in that area of the Orient Claims now included in the eastern section Kleinfontein. The results are very satisfactory, and if taken in conjunction with the values obtained in those sections of the Van Ryn and of the New Modderfontein G.M. Co., which immediately surround the Orient Claims, point to the fact that these claims will prove a most valuable addition to your property. (2) The appreciation in the value of the ore developed in the central section during the year under review, as compared with the ore developed in this section during 1910. The whole of the ore developed in this section has been on Main Reef and has averaged 8.61 dwts. over a milling width, as compared with 6.62 dwts. over a milling width in 1910. The appreciation appears to be maintained in depth as the value of the ore at the lowest exposure is as follows:—18th level, drives east and west, 33.64 dwts., over 46.25 inches; bottom of central shaft, 8.13, over 42.00 inches. A further satisfactory feature in the development in this section is that a boxhole from the 18th level intersected Upper Main Reef, assaying 10.30 dwts. over 42 inches, indicating that there is every probability of exposing a payable body of this reef in the area opened up during the period under review. (3) The depreciation in value of the ore developed in the western section during the year under review, as compared with the value of the ore developed in this section during 1910. The value of the ore exposed, which has all been on the Main Reef, has been very disappointing, as it has only averaged 3.95 dwts., as compared with 5.97 dwts. during 1910. (4) The fact that in spite of the large tonnage of low grade ore developed in the western section, the value of the ore reserves has not depreciated. This is clearly shown by the following comparison:—Total ore reserves: As at 31st December, 1910, 1,397,412 mill tons, 39.35 mill width inches, 6.46 dwts. mill value; as at 31st December, 1911, 1,607,015 mill tons, 43.07 mill width inches, 6.40 dwts. mill value. Whereas in 1909 and 1910 only the eastern section was developing ore of a satisfactory grade, in 1911 the ore developed during the year was of a satisfactory grade in both the eastern and central sections. This is a distinctly encouraging feature, and when taken in conjunction with the developments obtained on the South Reef in the Main Orient Section, and of the probable high value of the Main Reef, which all indications justify me in assuming will be encountered in this section of the Orient Claims, foreshadows a gradual appreciation in value of the development grade during 1912. In order that this statement may be fully appreciated, it is necessary to point out that the tonnages of ore remaining in the Main Orient, eastern, central and western sections, into which the mine is now divided, are approximately equal, and that consequently the tonnages developed and mined from each section should also be approximately equal. During the year under review, the percentages of the ore developed in these sections were as follows :—Orient section, South Reef, 2.3 per cent.; Eastern Secttion, Orient Claims, 3.5 per cent.; Eastern Section, Main Eastern Section, 11.5 per cent.—15.0 per cent.; Central Section, 37.0 per cent.; Western Section, 45.7 per cent. Total 100.0 per cent. Had it been possible to develop equal tonnages in these four sections, the average value of the ore developed for the year would have shown a considerable appreciation, as compared with the ore developed during 1910. At present this is not possible owing to the following facts: (a) That the Main Reef has not yet been intersected in the Main Orient Section; (b) That the development in depth in the eastern and central sections has been retarded owing to numerous up-throw faults coming diagonally across the lower levels from the Van Ryn Property, and (c) That the western shaft is considerably ahead of the other shafts, in consequence of which there are more development faces available in this section. The best policy will be to develop and mine, as far as it is practically possible, equal tonnages from all four sections of the mine, and every effort is now being made with this end in view to push ahead with development in the Main Orient, eastern and central sections. If this policy is successfully carried out, and I see no reason why this should not be the case, it must result in a steady and progressive increase in development values, and this increase in development values must, with equal certainty, ultimately be reflected in the ore reserve position and in the mill returns. The chief factors responsible for the reduction in the profit-earning capacity of the mine during the past year were the following :—(a) The increased cost of recruiting native labour and the rise in the scale of native wages. (b) The shortage of native labour during the latter part of the year. (c) The increase in development and mining costs in the central and eastern sections, owing partly to the faulted nature of the ground encountered in the lower levels in these sections, and partly to the considerably increased expenditure incurred in mine maintenance in these sections as the result mainly of the use of mechanical appliances to an extent only economically justifiable by the shortage of native labour. (d) The fall in the development grade which culminated in October last and necessitated a conservative policy being adopted with regard to the grade of ore to be sent to the mill. Happily the development grade, as I have already pointed out, has shown a steady and marked appreciation since November, and the labour position is also improving. It will, of course, be some considerable time before the improved development results effect any appreciation in the ore reserves position; and it must, moreover, be borne in mind that, for some months to come, the cost of developing and mining the ore in both the eastern and central sections may be expected to increase on account of the abnormal amount of cross cutting necessitated by the faulting at present being met with in the lower levels in these sections. It is known that, although these dislocations must give rise to a certain amount of trouble in the actual work of development, they will not lead to any loss of ore. On the contrary, there is little doubt that compensating overlaps will be encountered from time to time and will, with the very good value of the ore in these sections, more than counterbalance the increased cost of opening up this ground for stoping. Borehole results on the north boundary of the Van Ryn Deep Company's property prove the continuity without loss, through dyke intrusions of the ore and of its value. The general outlook is much better than it was at the end of 1910, and the results of the policy which the Board has sanctioned must ultimately be favourably reflected in the mill returns. Increase in reduction plant :—The actual work of increasing the capacity of the plant as already foreshadowed, was commenced during the year. The best method of effecting this increase was very thoroughly gone into, and it was ultimately decided :—(a) To erect four tubemills, thus enabling the existing battery to deal with the increased tonnage, by substituting in a portion thereof coarser mesh screening than is at present in use; (b) to enlarge the existing cyanide plant so as to enable it to cope with an output of 50,000 tons per month. During the period under review full detailed plans and specifications have been got out, tenders for and accepted, and a commencement made with the work of erection, which it is hoped to have completed by the end of May next.

THE GEOLOGY OF THE RAND.

Mr. W. E. Bleloch's Contribution to the Discussion.—Conflicting Opinions—" A New Chapter in Rand Geology."

At the last meeting of the Geological Society of South Africa, Mr. Bleloch said: I am glad to find that Dr. Mellor has not accepted the old ideas, which I some time ago criticised, at any rate altogether, for I gather that he, no more than I, can see an outcrop of the ripple-marked quartzites in the neighbourhood of Ocean Street, Kensington, but that there he sees outcrops of the Langerman's Kop Bankets. Further, he tells us he can see no evidence of the supposed great diagonal fault described by Drs. Hatch and Corstorphine as occurring in the Bezuidenhout Valley; a fault for denying whose existence I was severely taken to task. Again, Dr. Mellor confirms the view that the upper portion of the beds which I named the Market Square-Fairview series are really there. These beds are called by him the Government Reef Series, and he considers they are not to be identified with the Hospital Hill Series, as Drs. Hatch and Corstorphine and others have been teaching us for years. I wish to add that on all these points Dr. Mellor confirms what I wrote in a treatise on the Witwatersrand System some two years ago, which, I believe, he has read, and in any case he must have known of my views, because he was present when I referred to all these in my reply to Mr. Draper's attack on the same treatise at a meeting of this society. I find it strange in these circumstances that Dr. Mellor has not mentioned this, even although notices in the Press, and especially in the technical Press, have alluded to him as the original discoverer of two of these points in what may be termed his new reading of the old geology, and that without any demur on his part. Perhaps the observations of a mere amateur, although an old member of the society, are not now considered of any account. With your permission I will briefly summarise the position we have arrived at in regard to Central Rand geology as laid down in papers and discussions before this Society :—Mr. Walcot Gibson first suggested that the Langerman's Kop beds might be a faulted portion of the Elsburg Series. Mr. Draper at a later date confirmed this view, and stated that in arriving at this present position the beds in question, together with part of the Klipriversberg diabase, had become inverted by folding—turned right over—with the Elsburg beds on top, and the diabase below. It may conveniently be remembered that Mr. Draper also identified the Botha's series with the Elsburg. Still later, Drs. Hatch and Corstorphine re-discovered the identity of the Langermann's Kop and Elsburg series, but they adopted the idea of unconformity of the Elsburg series, and accounted for the present position of the Langermann's Kop portion by simple downthrow faulting. They rejected the idea of inversion of Mr. Draper. They also rediscovered, after Mr. Draper had some years before suggested it, the great diagonal fault across the Bezuidenhout Valley, which is supposed to have had the effect of duplicating the Hospital Hill Series on the Kensington Ridge on the south side of the valley. They identified all the quartzites of that ridge as Hospital Hill quartzites, and the Belgravia beds to the Main Reef Series as Doornfontein beds, thereby eliminating the Government Reef Series of Dr. Mellor (my Market Square-Fairview Series) from the lower Witwatersrand System. Mr. Zimmermann refused to recognise Langermann's Kop beds as Elsburg, because of their difference petrologically to that series. Dr. Mellor now reasserts the identity of the Langermann's Kop beds with those of Elsburg. He does not accept the inversion by folding theory of Mr. Draper, but adopts the idea of unconformity and downthrow faulting, although he admits there is no visible evidence of unconformity of the Elsburg Series on the Rand. While he states that he can see no evidence of the diagonal fault of Drs. Hatch and Corstophine, he divides the Kensington Ridge into two by a great longitudinal fault, and thus in another way accounts for what he considers to be a faulted portion of the Hospital Hill Series being in position close to his Government Reef Series on the Ridge. He thinks Drs. Hatch and Corstorphine were in error in ignoring the latter series, and in identifying all the beds of the Kensington Ridge and Belgravia, respectively, with the Hospital Hill and Doornfontein beds. It is seen, therefore, that in order to establish the identity of the Langermann's Kop beds with those of Elsburg and the speckled bed and striped and contorted shales, and the green quartzites of the Kensington Ridge with the speckled bed and striped and contorted shales and the green quartzites of the Hospital Hill, the two identifications on which the main theory of what I will call the orthodox school, and Dr. Mellor's main theory, are built, many difficulties are encountered, and they are got over in most diversified ways by the exponents of these theories. These difficulties have required the following assumptions to be made by these various exponents :—(1) Unconformity of the Elsburg Series with downthrow faulting (it being admitted there is no visible evidence for this on the Rand) Gibson, Hatch, Corstorphine, Mellor (contemporaneous overlap by deposition and downthrow faulting). (2) Folding and inversion of the Elsburg Series and Klipriversberg diabase (Draper). (3) Diagonal faulting and duplication of the Hospital Hill Series, the elimination of Dr. Mellor's Government Series and the identification of the Belgravia beds as Doornfontein shales (Draper, Hatch, Corstorphine). (4) Longitudinal faulting and duplication of the Hospital Hill Series, but retention of the north Coronation, Government Reef, and Belgravia beds as distinct and separate series, not to be identified with the Hospital Hill or the Doornfontein beds (Mellor). (5) The identification of the Rietfontein beds with those of Langerman's Kop, and consequently with the Elsburg Series, and their elimination from the lower Witwatersrand system. (Draper, Hatch, Corstorphine, Mellor). Note: Dr. Mellor's description of his great longitudinal fault seems to imply that it caused both downthrow and upthrow of the beds to the north of the same supposed line of faulting. With all these conflicting and contradictory opinions, both as to cause and effect, it is strange that Dr. Mellor's papers have not brought forth more comment. Mr. Horwood alone so far has come forward, and he has ponted out :—(1) That there are more than one speckled bed, and more than one striped and contorted shale accompanied by green quartzites in the Witwatersrand system, and that this is admitted by Dr. Hatch. I may add that Mr. Sawyer, Mr. Tottenham, and others also show two in the Witfontein area, the upper one being that referred to by Mr. Horwood as the Coronation Shales. (2) That the Rietfontein Mines, of which he has had long experience, have furnished evidences that the Rietfontein beds are truly inter-bedded members of the Lower Witwatersrand system. In his reply to Mr. Horwood, Dr. Mellor has reiterated his belief in the duplication of the Hospital Hih Series, relying mainly on the sequence of three, viz., speckled bed, striped contorted shales, and green quartzite of the two occurrences. I now ask, is it not possible to have such a sequence of three recurring in nature? Is it not rather a weak basis on which to build such a theory of faulting as Dr. Mellor assumes? I will endeavour later to show that in relying on this basis Dr. Mellor has in one particular instance been misled into what I think is an evident error in the reading of a simple piece of local geology. Dr. Mellor relies also on the Coronation Reef and shales. I have examined all three sections where he describes these beds as occurring. The Coronation Reef at the Witpoortje section has a coarse-grained gritty red rock for its footwall, with pebbles included. The Coronation Reef at the Hamburg section has as its footwall a fine-grained shale merging into a fine-grained striped ferruginous shale. The alleged Coronation Reef, which is very ill-defined in the Rietfontein Series, lies on a coarse red shaley rock with grits included. I cannot make either the sequence or character of the rocks agree in these sections as Dr. Mellor does. I may add that the shale at the Hamburg section is a wide band of fine fissile shale, not a few feet as Dr. Mellor suggested, and that there is nothing like it so far as I can see in the other two sections. In replying to Mr. Horwood's remarks about the Rietfontein Series, Dr. Mellor disagrees with Mr. Horwood with regard to the evidence of conformity which actual mining has revealed, and says that prospecting has failed to locate the Rietfontein Series elsewhere. Many people can show him if he wishes actual outcrops of the Rietfontein Series carrying rich gold with buckshot pyrites and carbon at Langermann's Kop. It is true that beds immediately west of Johannesburg have not yet been found showing the same characteristics, but the Rietfontein beds may have thinned out or they may have been faulted out by one of Dr. Mellor's own longitudinal fault, and in any case I can speak with experience on the other side so far as prospecting is concerned, because I don't think any one has done more work nor spent more money and time putting the theory of the identification of the Rietfontein Series with the Elsburg Series to the test, and I can say that although many boreholes have been sunk and thousand of pounds have been spent in looking for the Rietfontein Reefs in the Elsburg Series, the result has been complete failure, no sign either of such beds or their accompanying schists and shales can be found, so far as I know in the Upper Witwatersrand system anywhere along the Rand or elsewhere. But when work has been done on the theory of the normal position of the Rietfontein Series, similar beds with the same characteristic mineralisation have been found in the proper horizon overlying the true Hospital Hill Series at the following places: Buffelsdoorn, Rietkuil, Elandslaagte, Kleifontein, Van Ryn, Modderfontein, Nigel, etc., all these contain bankets carrying similar forms of carbon and round pyrites accompanied by gold, to those which the bankets of the Rietfontein Series carry. I will leave the matter of the granite in Rietfontein Mine to Mr. Horwood, who, I believe, with others, considers the evidence afforded by the mine workings to point to it being an intrusive body, inasmuch as its behaviour is like that of an ordinary dyke. As you are no doubt aware, I am engaged in some extensive work just now which is yielding some important evidence, and this with other new facts, I may embody in a paper at a later date, should my remarks of to-day find a welcome. For the present I will only select one concrete instance among the many in which I think Dr. Mellor may not have found the correct interpretation: About half a mile west of the old Geldenhuis mill, Dr. Mellor shows a transverse fault, which in my opinion, has no existence in fact. It is at this place where he eliminates his alleged Hospital Hill quartzites, and brings his Hospital Hill shales right up against his Government Reef Series. My observations lead me to the conclusion that the portion of the supposed Hospital Hill shales and speckled bed considered by Dr. Mellor to have been thrown south by the fault, are not the same shales and speckled bed which he has been following eastwards from the Kensington Sanatorium, but are different bodies of speckled bed and striped and contorted shales altogether, whose position is to the south of his alleged Hospital Hill quartzites, and whose outcrops, although not always striped and contorted and speckled, can be seen almost continuously running along the ridge south of the Scottish Monument quartzites. In fact from Sir. Abe Bailey's house eastwards along Dr. Mellor's Coronation horizon to Rietfontein and beyond.



Sketch Plan of an area west of Geldenhuis old mill where Dr. Mellor shows a transverse fault.

Mr. Horwood has shown how Dr. Hatch was misled by the occasionally striped character of similar shales, and the occasionally speckled character of similar quartzites, and I am afraid Dr. Mellor may also have been misled. The speckled bed accompanying the shales No. 2, supposed to be faulted, will, on close examination, show considerable difference to the other one, and the intervening shales and the very conspicuous white quartzite bed between the supposed faulted shales and the green quartzite (supposed Hospital Hill quartzite) which Dr. Mellor shows as terminating on the west side of the supposed fault, do not so terminate, but obviously continue right through the valley, that is, right through the supposed fault, and reappear again on the other side; these outcrops being merely covered for a short distance by a thin covering of detrital material. I submit that this is the correct reading. I have discussed the matter with several observers on the spot, and they agreed that this is the correct reading, and if admitted it will show that a sequence of two, viz., speckled bed and striped and contorted shales, in any case can recur sufficiently similarly to mislead a trained geologist. This reading would relieve Dr. Mellor of the necessity of eliminating his Hospital Hill quartzites at this place. As a matter of fact right here there is an excellent sample of the thinning out of beds suggested by Mr. Horwood and rejected by Dr. Mellor. The bed of dense green quartzite which in my opinion, he wrongly identifies with the Hospital Hill quartzites, here thins out on the west side of the little valley to an insignificant bed and disappears for a short distance, but it reappears again in the east side of the valley. I may add that recently I have discovered certain characteristics of the beds of the real Hospital Hill Series, which, I think clearly distinguished them from any of the supposed duplications. In my opinion many of these conceptions of great faulting, duplications, inversions of beds, are unnecessary, because some of these new facts and many old ones clearly indicate that a much simpler explanation, viz., that which I have already put forward is most probably correct. It is true that if I were to write my treatise over again to-day, there would be some important modifications and additions, but the evidence obtained as work proceeds shows that the main idea is fully confirmed. In many cases exploring work alone can disclose absolute proof. For instance, in the above case a very little expense would uncover the white quartzite where covered with the dterital material, and it seems that the Geological Survey might well spend the few pounds necessary to make sure it is right in this instance. In conclusion, I wish to thank Dr. Mellor for one feature of his papers, which has been of some help to me, and that is his conception of longitudinal faulting along the Witwatersrand on a great scale. I consider that in this he has truly opened a new chapter in Witwatersrand geology, and has advanced a possible means of solving many difficulties no matter which theory is held. For instance, exactly such a longitudinal fault as he describes may account for the partial disappearance of the Langermann's Kop beds to the west of Johannesburg more satisfactorily than simply by the thinning out of the pebble beds, to which I have formerly attributed it, and although differing from him altogether in his application, I think that in this he has helped forward the eventual clearing up of some of the difficult points in Witwatersrand geology.

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Dr. MELLOR'S READING OF RAND GEOLOGY.—II.

Interesting Discussion by the Geological Society—Mr. J. S. Olver's Contribution.

To the discussion on Dr. Mellor's paper at the meeting last week of the Geological Society, Mr. J. S. Olver made the following further contribution :—

I do not intend to repeat the arguments put forward in my book, but merely to state the results of later observation.

I have nothing to add to my reasons for believing that the Main Reef Series is being worked in the Rietfontein district, except to say that the reef opened up to the north of the "Main Reef" near the Kleinfontein-Van Ryn boundary is probably the true North Reef of the Central Rand. If that be so, the correlation of the series is complete.

In dealing with the Rietfontein section in my book, I was very cautious in correlating the "South Rietfontein Reef" with the Bird Reef. Further examination has greatly strengthened the case for that correlation. There is no longer any reason to doubt that the "South Rietfontein Reef" is conformable to the "pay" reef. The general likeness of the former reef to the "Bird Reef" is certainly very striking. The compact body of reef, with stringers above and below; the colour of the pebbles; the presence of occasional striped pebbles, and the nature of the matrix are all typical of the Bird Reef, as is also the occurrence of broad bands of talc in the enclosing country. The pebbles are larger than I have found them in the Bird Reef in any part of the East Rand, but they are little, if at all, larger than those exhibited in that reef on the Main Reef West property near Maraisburg. In any case this variation in size of pebbles is of very slight importance. Such changes may be seen in any particular reef in almost every mine on the Rand. For instance, the larger pebbles in the Main Reef Leader in the Maraisburg district are generally about 2—3 inches in length, yet considerable areas are found in which the largest pebbles scarcely exceed an inch in length, and on the other hand I believe I can show pebbles from that leader in the same district which are well over a foot in length.

The presence, then, of a reef with all the characteristics of the Bird Reef, in the proper relation of that reef to the reefs which I have identified as the Livingstone and Main Reef series, is a very strong argument in favour of that identification. I prefer, however, to rely mainly on the character of the "Dupreez Reef" series itself. I contend that the similarity of that series, including the enclosing quartzites, to the Main Reef series is quite sufficient to establish its identity, provided that irrefutable evidence in contradiction is not provided by the associated beds, and I think I have done enough to show that no such evidence exists.

There is little to add to my description of the "Dupreez Series," except that there is a bed at Rietfontein which closely resembles the Red Bar of the Main Reef series. I have spoken of the true North Reef at Rietfontein. This may be seen outcropping just north of the Black Bar to the east of the No. 5 shaft. North of this again is a bed of similar character to the Black Bar. It resembles the Red Bar in its relation to the North Reef and in exhibiting very small white pebbles scattered irregularly through the "shale." It differs from the Red Bar in that its colour is a richer red, approaching more nearly to the Black Bar in this respect. The bed under discussion lies close to the great northern fault at Rietfontein, and one has to be somewhat cautious in expressing an opinion upon it, but it seems quite likely that it represents the Red Bar in this area.

For the rest, it may be repeated that the occurrence of both "buckshot" and "carbon" in the South Reef at Rietfontein is, in regard to comparison with the recognised South Reef, a point of likeness and not of difference.

It will, no doubt, be very difficult for the followers of the orthodox school to accept this correlation of the Rietfontein reefs, seeing that they do not recognise the existence of the "Rietfontein Fault," but it should be much easier for Dr. Mellor to do so. I suggest to him that his own estimate of the throw on the Rietfontein Fault is large enough to permit him to accept this duplication of the Main Reef series without sacrificing any essential part of his remaining deductions.

As to the disciples of Mr. Bleloch, the very basis of their creed is the identity of the Rietfontein and Kleinfontein reefs. I have already stated that this resemblance is so striking that it cannot be overlooked by any observer who is familiar with the reefs in both areas. My theory amply explains this likeness—in fact establishes the basis of the Bleloch theory, while it demolishes, and at the same time renders unnecessary, the structure which has been built upon that basis.

Speaking with an intimate knowledge of the Main Reef series and long familiarity with its most minute features and its almost infinite variations in many mines along the Rand, and after due consideration of any arguments which have been brought against my theory since its first publication, I reiterate my confident opinion that the reefs at Rietfontein are a detached block of the Main Reef series; and I invite this Society to make a thorough study of the evidence which I have put forward, in order that this question may be finally settled.

It is scarcely possible to exaggerate the importance of this theory in its bearing upon the problems of Rand geology. If it be once accepted, one of the principal bones of contention will be removed, and a strong base will be provided from which we can all work towards the solution of the whole problem. I take it, indeed, to be the key to the whole position.

It must not be thought that this contribution has been inspired by antagonism to Dr. Mellor. I have, in fact, more than once offered to help him in the field to elucidate any of the points upon which we differ. I fully recognise the value of the work which he has already done, but I feel sure that it is not safe to accept his provisional conclusions in their entirety. I know from hard experience how heavy a task he has undertaken, and how difficult it is—if it is not altogether beyond ordinary human capacity—for any one man to unravel all the intricacies of a problem of this magnitude. Sympathetic, yet searching, criticism is not only a necessary corrective, but gives very real help to the worker, provided that he keeps an open mind. That is, I take it, what Dr. Mellor asked for when he offered these papers to the Society. There is, I repeat, a great danger that the failure of the Society to respond to this invitation will be taken by Dr. Mellor and others to imply complete acceptance of his work. It may be that members are waiting for the completion of his task before they launch their criticism. That is perhaps the safest course for the hostile critic, but such belated criticism can give no real help. It must be remembered that Dr. Mellor is engaged in erecting a vast structure—not by the building of facts upon a sure foundation of fact, but with material much of which can only be obtained by deduction from imperfect data. The inferences from one stage of the structure become the bases of the next. Criticism, if it is intended to be constructive and not destructive, should therefore be applied at each stage of the process of erection, before inference has hardened into firm conviction.

I gather that the object of Mr. Horwood's contribution to this discussion was to initiate constructive criticism of this kind, rather than to express a settled opinion; and I am following his lead in suggesting that the time for the discussion of Dr. Mellor's two papers be indefinitely prolonged, and that this Society concentrate its efforts for the moment upon an endeavour to secure a general agreement upon the geological position of the Rietfontein reefs.

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Rhodesian Section.

LATEST MINING NEWS.

The Water Shortage—A Serious Outlook for Mines and Natives—The Eileen Alannah: Rumours and a Report—The Central Mining Corporation in Mashonaland—The Oceola Floated—Globe and Phœnix News—Union Jack and Three Cheers.

The outstanding feature of Rhodesian mining at the present time is the scanty rainfall and its results. All over Southern Rhodesia one hears of the serious position confronting many of the mines. It seems too late to hope for any real relief now, and without being unnecessarily pessimistic in the matter, it is practically certain that within the next few months a number of the mines will be compelled to hang up a certain number of stamps, while others will be compelled to stop operations altogether.

* * * *

To the South-west of Bulawayo the rainfall has been exceedingly small. Around the Antelope Mine, for instance, only about two inches have fallen to date. Equally serious is the almost total failure of the native crops. Naturally, there will be any quantity of indigenous native labour offering at the mines, as work there will provide a means to the money that can be converted into grain. In normal times this free offering of labour would be of the greatest advantage to the industry, but, since the absence of water that has ruined the crops has at the same time made it probable that many of the mine batteries must close down, this seems likely to be an ill wind that will blow nobody any good. With the position as serious as it is to-day, it follows that the worst will only begin to be realised in a month or two's time. Those employers who can do so will therefore be wise to make such provision as may be possible, both by way of water conservation and grain purchases, in the meantime. Although too late to save the crops, a few days' general downpour would go far to save the situation so far as mining operations are concerned. But it is to be feared that it is very late in the season to look for anything of the kind, and, if the rains do not come, the effect on the year's output must, of course, be disastrous.

* * * *

An instance of the influence of water shortage on returns has already been afforded by the Selukwe Columbia. The company's Bulawayo agents having reported under date March 4th, that the mill was stopped for want of water, a cable was dispatched by the directors requesting them to state when the mill was likely to resume operations. A cable in reply to the directors' message was received, reading: "Referring to your telegram—manager of the mine telegraphs mill started yesterday; running day only. Have to stop air-compressing plant, not sufficient water to run all the plant."

* * * *

The Eileen Alannah has rather been discredited by Dame Rumour in Salisbury of late. It has been said that recent developments in depth have not been any too pleasing. Considerable interest attaches itself, therefore, to the following cable, which has been received by the London Board, stating that a new pay-chute has been struck on the second level east at 930 feet east of incline shaft. The values for 25 feet driven are as follow:—At 950 feet 5·7 dwt. over 69 inches; at 955 feet 9·1 dwt. over 68 inches; at 960 feet 6·1 dwt. over 52 inches; at 965 feet 11·1 dwt. over 56 inches; at 970 feet 19·1 dwt. over 95 inches; at 975 feet 14·7 dwt. over 117 inches. Colonel Heyman also sent a subsequent cable, dated March 7th, stating: "Referring to our previous telegram of the 7th—Ackermann telegraphs from the mine as follows: 'Much impressed new development. Present face 88 inches wide being well defined between good walls. Last assay 10·8 dwt. over 88 inches.' There is no doubt about it being a very important strike.—Heyman."

* * * *

The Central Mining and Investment Corporation has never interested itself to any noteworthy degree in Rhodesian mining; in fact, this House, together with the Johannesburg Consolidated Investment Company, appears to have well-nigh ignored Charterland as a mining field. Within the past two years or so the Corporation has done a certain amount of work in Mashonaland, but it has been of little importance. The Corporation has done some development work in the Hartley district, and it has recently been reported that the Corporation were about to cease work in and around Hartley altogether. This, however, does not appear to be true, as it is authoritatively stated that the company intend putting up a mill on the Seigneury mine. This property is situated on the north side of the Umfuli River. Recent developments are reported to have been quite satisfactory.

A Miniature Mill, Matabeleland.

* * * *

The Oceola Gold Mining Company, Ltd., has been successfully floated at Salisbury, and it is anticipated that crushing will commence in two months' time. The necessary plant is in course of erection, and development will be rapidly pushed on.

* * * *

The following are the development figures at the Globe and Phœnix for the month of February:—During the past month the following work has been done: Main shaft has been advanced 5 ft. 17th level east portion No. 3A winze 17th to 19th levels, has advanced 29 ft., average width of reef 14 ins., average value over a stoping width of 30 ins. 15 dwts. 18th level drive north from No. 2A winze, prospecting on line of combined reef, has advanced 39 ft. 18th level drive south from No. 2A winze, east portion, has advanced 92 ft., average width of reef 35 ins., average value 56 dwts. 18th level No. 2A winze, 18th to 19th levels, has advanced 7 ft., average width of reef 38 ins., average value 102 dwts. 19th level, drive north from 1A winze, east portion, has advanced 71 ft., average width of reef 9 ins., average value over a stoping width of 30 ins., 3 dwts. 19th level drive south from 1A winze east portion has advanced 21 ft., average width of reef 5 ins., average value over a stoping width of 30 ins. nil. Cross-cutting for the month, 17 ft. The company is erecting additional plant, and have now finished the installation of an up-to-date roasting plant. If the present shortage of water continues, the use of the plant will become a matter of great difficulty. The company has a contract out for the erection of a further 14 steel tanks to be used in connection with their cyanide plant.

* * * *

The Union Jack mine at Battlefields, formerly worked by Mr. T. C. Smith, is shortly to be re-opened by Messrs. James, Morrisby and Stewart, and it is announced that the tailings from the Three Cheers mine have been acquired by Mr. Nalty, who will remove his cyanide plant, now at the Glendara mine, to the Three Cheers.

NORTHERN RHODESIAN COPPER.

An Epoch of Activity—New Smelters Installed—Some Transport Problems.

Whilst much trouble is being experienced in the Katanga region in smelting the carbonate ores of the Tanganyika Concessions (so much so, we understand, that the furnaces are idle, and a complete reorganisation of the metallurgical scheme is receiving serious attention), copper mining affairs on this side of the British-Belgian boundary are more active than they have been for years past. Northern Rhodesia is, in fact, attaining to some importance as a copper producer, and contemporaneously with the promulgation of a mining law for the Northern territory, serious efforts are being made to justify some, at any rate, of the many official predictions that have been made from time to time regarding the areas which have been floated and nursed under the auspices of the Northern Copper Company and Mr. Edmund Davis.

The existence of extensive cupriferous measures to the north of the Zambesi River was first brought home to the public so long ago as 1895, when expeditions were despatched to what was then generally known as Barotseland. As a result, large areas were pegged in various localities of North-Western Rhodesia, notably in the "hook" of the Kafue River, and in the vicinity of N'Dola, close to the Congo Free State frontier. In those days the railway had not been extended even so far north as Bu'awayo, and the Northern Copper Company's territories were regarded as being in the heart of the unknown and vast interior. With the construction of the Northern Extensions system—of the Beira and Mashonaland Railways from the Victoria Falls to Rhodesia Broken Hill, the position with regard to transport was, of course, greatly improved, and at a later date the carrying on of the line to Elizabethville brought the famous Malachite deposits at Bwana M'Kubwa virtually alongside the railway line.

The mines situated in the hook of the Kafue River are still, however, a long way from the nearest point on the line at the Kafue Bridge station, and accordingly two or three schemes of bettering the transport conditions at these outlying properties have been considered. One idea suggested some five or six years ago, and of which little has recently been heard, was to construct a railway from the Silver King to the Kafue Bridge. Another project which would have been feasible were the Kafue less broken by rapids and cataracts, was to utilise the Kafue River and carry down ore in steel barges. Despite these obstacles, a 25-ton smelting plant has been erected at the Sable Antelope mine, and at this copper from the neighbouring Silver King mine to the estimated value of £51,000 was produced during 1911.

The Sable Antelope and Silver King are distant eight miles from each other, and in proximity to these are the North Star, Maurice Gifford, Crystal Jacket, True Blue, and Blue Jacket blocks, on all of which a certain amount of preliminary development work has been carried out. The Hippo Mine is situated thirty-seven miles from the Sable Antelope, and consists of 160 claims. The last available report of the Kafue Copper Development Company stated the ore in sight as follows:—

	Tons.	Copper per cent.
Sable Antelope	7,000	16·0
and	5,000	4·5
Silver King	3,500	24·7
Hippo	5,000	15·0

(and about 4 dwts. gold per ton).

Whilst there are apparently considerable tonnages of ore of such high value that profits can be earned therefrom, despite economic disadvantages, these Kafue mines are of lesser importance than the Kansanshi and Bwana M'Kubwa mines situated on the Rhodesia-Congo frontier. The latter property—famed for a huge cave of solid malachite—recently sent to England 700 tons for experimental treatment, and is now engaged in the erection of a smelting plant. A fifth level has been cut at a depth of 550 feet, and development work is proceeding. The ore in sight down to the No. 3 level has been estimated at 120,000 tons, averaging about 14 per cent. of copper, and in addition there is a large tonnage of lower grade ore in the impregnated zone assaying about 5 per cent. The Bwana M'Kubwa mine is situated about one hundred and eighteen miles north of Rhodesia Broken Hill. The Kansanshi Mine is not controlled by the Northern Copper Group (it is owned by the Rhodesia-Katanga Junction Railway and Mineral Company, Limited, and the Tanganyika Concessions, Limited, are interested in it), but it is of such importance that some mention of its recent achievements is called for here. This concern has been productive for four years, and is situated thirty miles south-west of Elizabethville, and about 130 miles north-west of Bwana M'Kubwa. A new pumping plant and smelter have recently been installed, and four new traction engines are now running, carrying a load of 22½ tons of copper per trip to the railway.

Clearly a new era of activity for these Northern copper mines has recently been ushered in, and though they are far less known than the great mines in the Katanga belt, they are likely to become noteworthy in the very near future. North-western Rhodesia is progressing slowly but surely. The country is now traversed from south to north by a railway, and should developments justify such projects, branch lines will be built to tap some of the more important copper areas situated between the existing line and the valley of the Upper Zambesi.

Abercorn Tin.

Rhodesian advices state that Messrs. Eckstein and Co. are about to begin the production of tin on the alluvial claims they secured at Abercorn.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Promotion on the Mines.

"THE SQUARE DEAL" FOR THE UNDERGROUND MAN.

MINE v. OFFICE STAFFS.

To the Editor, *South African Mining Journal.*

Sir,—Referring to the lachrymose letter published in a recent issue of your journal over the signature, "School of Mines Man," I should like to make a pertinent or impertinent observation or two. A little reasoning would explain his querulous queries. He presumably premises that a School of Mines diploma confers some subtle excellence of brain and character on the holder, and argues from this a sort of exclusive claim or lien on staff billets in the Witwatersrand mines . He takes no note of that deserving body of men who have made the Rand mines both their training ground and their living—men with public school educations, who by sheer force of merit and hard and oftimes distasteful work have secured a footing here, in spite of the wicked prejudice of those in power and position who, being S.M. men themselves, regard any man not the holder of a S.M. diploma either as an unwelcome intruder—to be eternally thwarted—or as an utter alien. What better mines training school is there than the hundreds of miles of underground workings of the Rand? It is with no intention of decrying the unquestionable advantages of an all-technical education or the excellence of those institutions which specialise in mining training, that I remark having met several youths, who, notwithstanding their S.M. diploma, have made hopeless muddles of simple traverses underground, for example, and others whose diploma was unavailing where brains or initiative in practical work were demanded. What in my opinion influences men to abandon mining is the inadequate pay as much as the uninviting conditions. It has often passed my understanding that surface men—clerical men in particular—who have *not* to purchase underground clothes (which embraces a new pair of miner's boots once every two months, among other things), who are yet under the eider-down quilt when the underground man is changing into his damp "digging" clothes, who has *not* to breathe an air pregnant with pulverised rock, powdered drill steel, gelatine and fuse gases, an air foul with reek of excrement, and defiled with that poisonous antidote, chloride of lime—I say I cannot understand why men who complacently shuffle to and from office, doing congenial work and risking nothing more serious than an air-blast from a soda water bottle, should be placed upon the same level of remuneration as the hapless underground staff man. Having regard to the comparative risks and responsibilities it is absurd that secretaries should receive as much as mine captains, who often put in 12 to 18 hours a day (pace the Mining Regulations) and are underground what time the secretary sleepily swallows his matutinal egg. I have heard the secretarial people described as the "parasites of the mining industry," but this view is rather extreme and perhaps beside the point. Where, and oh, where, is the sane and perspicacious reformer—consulting engineer, director—who will differentiate in the matter of pay and bust up this long-standing anomaly!

Is it strange that an intelligent man should choose the office to underground when he can command the same figure above as below? I am willing to wager that if the salaries of the secretaries and business-managers were reduced by half throughout the Rand not 5 per cent. would throw up their jobs, and that with a little grumbling they would acquiesce. Why? Simply because they do one week's work per month and know that 50 per cent. of their present absurd salaries would be commensurate with the amount of actual work they do. The principle of nursing the drone, again, applies to the question of leave. A secretary will apply for and get three to six months' holiday; a shift boss, say, will be accorded a grudged fortnight—the former having sound lungs and being a candidate for longevity; the latter steadily wearing down his lung tissue, and, as recent published statistics make manifest, having "but a few years to live." How utterly illogical! Regard it again from the point of view of actual achievement or tangible results. Take the ledgers, files, statements, balance sheets and all the pettifogging cognate work, which a board school youth grounded in simple arithemetic cou'd undertake, and then ponder the vasty problems solved and difficulties overcome in the underground workshop of the Rand. A business-manager has time to sign hundreds of cheques with a hyphenated name—a sure sign of megalomania, by the way—but how many engineers or mine captains have the time to indulge the use of a hyphenated patronymic, given that they got it at the font and didn't assume it out of paltry vanity? Briefly, the office man is threatened with death from ennui, whilst the miner dies of phthisis. Let our directors study the mortality tables and adjust the staff pay on the basis of probable life of the individual accordingly.—I am, etc.,

"AIRBLAST."

The Prevention of Gassing Accidents.

To the Editor, *South African Mining Journal.*

Sir,—In spite of improved Mining Regulations and efforts on the part of the mine managements, the dangers from accumulations of noxious gases in "dead-ends" of mines are still present, and questions as to how to obviate such dangers will gain in importance, as the mines extend their workings to greater depths. What is wanted on the Rand is a thorough investigation into that matter. Does the rock issue any noxious gases? This is probably not the case on the Rand. The correct answer can, however, only be obtained by actually testing the air near development faces immediately after, and some hours after, such places were swept clean with fresh air, nobody being allowed to remain at or near such places in the meantime. Timbers in winzes are likely to issue noxious gases, but when the bark has been removed, no serious danger is to be feared. The consumption of oxygen by men, light, animals, minerals, timbers, and even blasting should not, as a rule, account for gassing accidents, but as it has a great effect on the efficiency and health of the labourers, the results from testing the air before and after the shift ought to be of interest. By far the most of this class of accidents are, of course, caused by the poisonous gases, derived from the incomplete decomposition of explosives. If the ventilating appliances were always in perfect order, and Mining Regulations strictly observed in each case, such gases would be carried off very soon, but nowadays, in mining as well as other industries, the principle is more and more recognised, to provide in advance against possible dangers, even in spite of carelessness of workmen, and to guarantee safety, even if a breakdown of machinery should happen. In our case, danger should be minimised by using for blasting in winzes, raises, back-stopes, etc., a special explosive which is less likely to produce noxious gases; if to ordinary blasting gelatine an oxidising substance is added, such as nitrate of potassium, monoxide of carbon is less likely to occur. On the other hand, the production of oxides of nitrogen has to be prevented. The ideal composition of an explosive varies with the nature of rock for which it is used, and it can only be found out by actual tests on the spot. For use in well-aired stopes, the breaking strength of an explosive is of main importance, but for use in "dead-ends" the products of its decomposition and their influence on the safety of men ought to be considered too. Plenty of air samples after blasting with different explosives in various quantities and under different conditions ought to be taken and tested to bring more light into the matter. As for the ventilation, there is no doubt that a strong current of fresh air in the main drives affords the best means for preventing the accumulation of abnormal gases. In nearly all development drives, rises, and many back-stopes, air drills are used, and the air applied for drilling serves at the same time for ventilating purposes. Yet just such air can act as a poison when anything is wrong with the compressor. In many back-stopes, and nearly all winzes, work is done by hand labour, and compressed air is supplied only for ventilating purposes. The danger is here, that the work can be carried on even if, for some reason or other, no air is available. An air pipe, made of sheet iron and about one foot in diameter should be preferred. Compressed air or a jet of water can be introduced into the pipe from the top, to draw in the air from the level. If air should not be available, the water should be, or vice versa, and a drain for the water can easily be arranged a few feet below the entrance to the air pipe, and just above the floor of the level, so as to prevent the water from running down the winze. Higher expenses would be over balanced by increased safety and efficiency. One great source of danger lies hidden in the fact that broken ground is able to retain the gaseous products derived from blasting for a considerable time, and only allow it gradually to escape. Especially when a rise or winze is abandoned and broken ground left in them, people entering those places run a great risk. Broken ground ought never to be left behind.—I am, etc.,

S. REINHEIMER.

Phthisis Prevention.

To the Editor, *South African Mining Journal.*

Sir,—I beg to hand you under cover a copy of our letter to the Secretary of the M.P.P. Committee, which will doubtless be of interest to you. Our simple and efficient apparatus receives the fresh air direct from the compressor pipes, and I shall be at any time pleased to show and demonstrate to you the device. In the meantime, I beg from you the favour to order the enclosed letter to be reproduced in your journal, as it will certainly be of great interest to most of the readers of your valuable paper.—Thanking you in anticipation, I am, etc.,

G. ANDRIESSEN.

The Miners' Phthisis Prevention Co.
(The Patent Pedersen Fresh-air Respirator and The Patent Pedersen Dust Absorber.)

The following is a copy of the letter addressed to the Secretary, Miners' Phthisis Prevention Committee:

Dear Sir,—We beg to place a few facts before you regarding one of our inventions, which is commonly known as the "Pedersen Pure air Respirator." This respirator was constructed for the specific purpose of protecting mine developers from contracting phthisis, and also insuring miners against being gassed in close and insufficiently ventilated ends of drives, rises, boxholes, back stopes, winzes, etc. To miners, both white and coloured, working in any of the abovementioned places the "Pedersen Pure-air Respirator" is invaluable, inasmuch as it not only gives the men a liberal supply of pure air to breathe straight from the surface, but the same pure air also precludes any local dust and noxious fumes from entering the mask which covers the mouth and nostrils of the men; hence it goes without saying that anyone wearing this apparatus may with perfect safety enter and do his day's work in a closed end, no matter how foul it may be with dust and fumes. The external surroundings cannot affect his respiratory organs, and it is certain that had the "Pedersen Pure-air Respirator" been installed in the mines along the Reef when first introduced, some two years ago, many hundreds, or rather thousands, of miners, both white and coloured, now affected with miners' phthisis would be in perfect health to-day, and might continue so to the end of their mortal lives, notwithstanding all dust and fumes in their underground workings. The only objections that have been raised to this respirator were with reference to the small rubber tubing attached to the main air filter as interfering with the miner's free movement about the drive or places where they are working; but surely this is no hardship when one considers that it is about as easy to attach or detach one's self from the air tubing, as it is for a man to take his pipe out of his mouth, laying it aside, and picking it up again when convenient. In other words, if the men want to move about further than the length of tubing will allow, they simply pull the end of the tubing off the small tap in the mask, and the latter remains on the man's face and acts as an ordinary respirator now in use generally in the mines. When the miner returns to his proper place at the machine, he simply reconnects the tubing to the small tap in the mask, and he then again breathes the pure air from the surface, carefully cleaned and cooled in the filter. We trust that, seeing the many deaths taking place from miners' phthisis, the committee appointed by the Government will recognise the immense value of the above device, which, so far, is absolutely the only one that can and will prevent phthisis. Of course, the careless miners will not like it, as they will avoid everything causing a little extra work or trouble. But it is for the Government to pass the most stringent regulations for the use of such devices in all underground workings where dust and noxious fumes abound; that will stop the terrible disease. By doing so we have no hesisation in saying that within a few years the dreaded miners' phthisis will become an almost negligible question on these fields. It is, therefore, in the interest of the miners, the Government, and the mine-owners if the use of our respirator is made compulsory. It will also mean the saving of large sums of money now spent as compensations, as the cost of our pure-air respirator is by no means higher than the usual outlay for the ordinary respirators now in use, but which are only to a very small degree preventative. We hold at your disposal many certificates from mine managers, captains and practical miners, who tried our apparatus, testifying to its absolute efficiency to prevent the disease, but we frankly admit that most of them express the opinion that our device must be made compulsory against the aversion and carelessness of the average miner in order to prove a thorough success.—Yours etc.,

L. PEDERSEN.

ANSWERS TO CORRESPONDENTS.

P. P.—The year ends on March 31, and the annual report is only now beginning to be prepared. We hope to answer your other questions in a short article to appear soon.

"Tin."—The Chairman and Consulting Engineer are now visiting the property, and a report will appear on their return.

"Shareholder."—In liquidation.

"Anxious."—No confirmation of the report in question is forthcoming. Such an enquiry would do no one any good.

Miners' Phthisis Board.

The returns published by the Miners' Phthisis Board and issued as a Parliamentary paper, shows that 492 cases were dealt with between September last and February, the total sums allocated to date, exclusive of passage money for rail or steamer voted but not yet paid, amount to £47,067. The total administration expenses to date amount to £2,047, and the average cost per case to date £95 13s. 4d. The daily rate of application was 3.4, and the number of cases awaiting consideration at the end of the month was 289.

LITERATURE FOR
MINING CAMPS.

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MARCH GOLD OUTPUT BREAKS ALL RECORDS.

Month Shows Increase Over November, excluding Reserves, of £99,912—New Form of Declaration.

The Transvaal gold output for March was declared on Wednesday as follows:—

Total output	830,723 ozs.
Value	£3,528,688
Increase	126,857 ozs.
Value	£538,856
Rand output	796,755 ozs.
Value	£3,381,400
Increase	121,795 ozs.
Value	£517,385
Outside districts	33,968 ozs.
Value	£141,288
Increase	5,062 ozs.
Value	£21,505
Total stamps	10,088
Increase	72
Rand	9,525
Increase	105
Outside	563
Decrease	33

It will be seen that the increase compared with February of 126,857 ozs., value £538,856, is enormous and exceptional. It is due, mainly, to the inclusion of gold reserves, concerning which the following official notice has been issued:—The Chamber of Mines notifies that the above declaration is the actual output of the mines during March, plus 70,143 fine ounces, value £297,946, the total gold held in reserve at the 29th February by all companies then holding reserves. In future the output as declared by the Chamber will be the actual output, excluding transfers to or from reserves if any, but in the monthly analysis sheet published by the Chamber, there will be two columns showing (1) the actual output, (2) the declared output of each mine, any difference between the two being due to transfers to or from reserves." Apart from the inclusion of gold of which value to the amount of £284,030 is contributed by Rand companies and £13,907 from outside mines, there is an increase over the previous record of January of practically one hundred thousand pounds and that month included £82,564 of reserve gold in its Rand total. The contribution from the Rand of 796,755 ozs., value £3,384,400, or 121,795 ozs., value £517,351, more than in February, after deducting the value of reserve gold included, gives £3,100,361 as the actual production for the month, and is £163,220 more than the previous best return made in November last year. For outside districts the increase of 5,062 ozs., value £21,505, is £26,290 better than for January, the previous record month, Rand and outside taken together, and £10,309 better than the November return, after excluding the declared reserve. The improvement in the average daily yield, apart from the gold reserves, corresponds with the increase of labour during the last three months, and the daily average profit, of course is increased. The increase in the labour complement is the highest we have had since the tide began to turn. As a large proportion of native crops have failed, it is probable that the usual winter falling off may be less serious than usual.

The Stamp Position.

The stamp position shows an increase on the Rand, and a decrease outside. The Rand increase is probably due to the extra number of boys which the last three months have made available. The details of changes are as follows:—Rand: Increases—Benoni Consolidated, 5; Cinderella Consolidated, 10; City and Suburban, 5; Consolidated Main Reef, 20; Jupiter, 25; Knight Central, 10; Main Reef West, 10; Randfontein Central, 5; Robinson Deep, 20; Simmer Deep, 5; Miscellaneous, 5; total, 120. Decreases—Ferreira, 5; Jumpers, 5; Midas Deep, 5; total, 15. Increase, 105. Outside: Decrease—Miscellaneous, 38. Increase, Sheba, 5. Decrease, 33. Net increase, 72. There were 251 tube mills in operation on the Rand, and 8 on outside mines.

Twelve Leading Companies.

The returns from the twelve leading companies show a relatively proportional increase over the shorter month preceding. There are some fluctuations in the order and composition of the leaders compared with February, and the E.R.P.M. again takes the lead as highest producer. City Deep disappears for the month, and Robinson Deep re-enters, taking seventh place on the list. New Modder goes down from sixth to eighth. Nourse Mines, Village Deep and Ferreira Deep all drop a point; the Simmer and Jack goes up from eighth to sixth. There were 125 more stamps operated in the aggregate, but six fewer tube mills. There were 9,869 more tons crushed for an increase in value of £122,560. The details of operations are as follows:—

	Stamps.	Tube Mills.	Tons Crushed.	Value.
East Rand Proprietary ...	820	25	163,000	280,975
Randfontein Central ...	805	27	229,612	260,615
Crown Mines	660	22	161,500	257,881
Robinson	250	6	46,700	106,117
Rose Deep	300	7	65,200	95,098
Simmer and Jack	320	7	73,800	91,101
Robinson Deep	230	5	55,500	87,346
New Modderfontein	180	7	48,750	86,531
Geldenhuis Deep	300	7	58,960	82,703
Nourse Mines	260	7	53,000	80,928
Village Deep	180	6	51,200	78,061
Ferreira Deep	160	4	33,950	77,258
Totals	4,465	130	1,041,202	1,581,617

Group Profits.

The following are the profits returned for January, February and March by the mines controlled by the different mines:—

	Jan.	Feb.	March.
Rand Mines	£206,122	£209,989	£267,989
Rand Mines-Eckstein group	221,326	213,242	373,426
Gold Fields	101,429	111,697	120,190
Farrar-Anglo-French ...	83,223	89,808	115,473
General Mining	62,797	48,400	61,777
Barnato	59,227	58,273	61,223
Neumann	44,280	46,072	52,686
Cons. Mines Selection ...	21,373	23,231	26,119
Goerz	11,860	12,242	11,231
Totals	£811,637	£812,954	£1,090,114

Our Monthly Table.

The following is our usual monthly table:—

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	12,352	60	3,396	144,215
Bantjes Consolidated ...	22,930	65	8,186	34,772*
Benoni	19,777	55	4,352	18,486
Brakpan Mines	46,782	110	16,931	71,918*
City Deep	40,030	110	16,047	68,163
City and Suburban	26,545	140	11,750	49,911*
Cinderella Cons.	17,280	75	6,441	27,360
Cons. Langlaagte Mines ...	21,193	140	7,008	29,768
Cons. Main Reef	21,700	100	7,269	30,877
Crown Mines	161,500	660	60,711	257,884*
Durban Roodepoort	14,151	90	3,612	15,343
Durban Roodepoort Deep...	25,140	100	8,482	36,029
East Rand Proprietary ...	163,000	820	66,147	280,975

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Ferreira	22,490	80	7,376	31,331*
Ferreira Deep	33,950	160	18,188	77,258
Geldenhuis Deep	58,960	300	19,470	82,703
Ginsberg	13,988	80	4,935	20,963
Glencairn Main Reef ...	18,078	160	3,741	15,891
Geduld Proprietary Mines...	14,670	50	4,541	19,289
Jupiter	40,650	105	10,313	43,934*
Jumpers—Treasury	8,550	80	4,196	17,823*
Knights Deep	60,600	270	12,084	51,330
Knight Central	23,720	100	6,166	26,191
Lancaster	21,820	100	5,658	24,035
Langlaagte Estate	53,866	200	14,102	59,901
Luipaards Vlei Estate ...	17,190	60	3,768	16,005
Main Reef West	15,571	80	6,250	26,548
May Consolidated	12,160	100	3,786	16,082
Meyer and Charlton	11,290	75	8,016	34,050*
Midas Deep	1,532	15	196	833
Modderfontein "B"	32,000	80	14,473	61,477
New Goch	25,225	120	6,527	27,725
New Heriot	11,370	70	5,108	21,697*
New Kleinfontein	39,880	220	13,085	55,582
New Modderfontein	18,750	180	2,371	86,531*
New Primrose	24,000	160	8,067	34,266
New Rietfontein Estate ...	16,342	120	5,018	21,315
New Unified	10,821	60	3,976	16,889
Nourse Mines	53,000	260	19,052	80,928*
Princess Estate	17,537	50	5,335	22,662
Robinson	46,700	250	24,982	106,117*
Robinson Deep	55,500	230	20,563	87,346
Randfontein Central	229,642	805	61,351	260,615
Roodepoort United M.R. ...	30,247	50	7,507	31,888*
Rose Deep	65,200	300	22,388	95,098*
Simmer Deep	45,500	115	10,253	43,552
Simmer and Jack	73,800	320	21,447	91,101
Simmer and Jack East ...	31,600	130	6,910	29,352
Spes Bona Tribute	5,752	40	1,383	5,875
Van Ryn Gold Mines ...	39,700	125	11,296	60,726*
Village Deep	51,200	180	18,377	78,061*
Village Main Reef	37,000	220	15,979	67,874*
Vogelstruis Estates	10,080	70	2,968	12,607
West Rand Central	2,818	20	980	4,163
West Rand Consolidated ...	28,500	100	8,219	34,870
Witwatersrand	39,020	220	11,060	46,980
Witwatersrand Deep	38,300	215	13,072	55,526
Wolhuter	30,050	120	9,725	41,309
Miscellaneous Producers ...		115	4,273	18,152
HEIDELBERG—				
Nigel	14,000	75	4,831	20,521
Sub Nigel	4,568	30	1,920	8,156*
BARBERTON—				
Barrett	—	—	190	807
Sheba—Rosetta	1,835	20	386	1,640
Sheba	6,000	70	2,912	12,369*
Worcester Exploration ...	5,150	40	1,273	5,407
LYDENBURG—				
Glynn's Lydenburg	3,177	20	1,876	7,969
Transvaal G. M. Estate ...	13,141	75	9,276	39,102*
KLERKSDORP—				
Miscellaneous Producers ...	—	233	8,030	34,110

*Brakpan 1,000 ozs., value £4.248, added to reserve. *City and Suburban 6,330 ozs., value £26,888, added to reserve. *Crown Mines 4,824 ozs., value £20,941, taken from reserve. *Jumpers 387 ozs., value £1,641, added to reserve. *Meyer and Charlton 1,000 ozs., value £4,248, added to reserve. *Modder "B." 5,828 ozs., value £24,756, taken from reserve. *New Heriot 1,022 ozs., value £4,341, taken from reserve. *Robinson 10,556 ozs., value £44,839, taken from reserve. *Roodepoort United Main Reef 236 ozs., value £1,002 added to reserve. *Rose Deep 6,125 ozs., value £26,017, taken from reserve. *Village Deep 5,900 ozs., value £25,062, taken from reserve. *Village Main 1,192 ozs., value £5,063, taken from reserve. *Van Ryn 1,239 ozs., value £5,263, added to reserve. *Sheba 99 ozs., £420, added to reserve. *Bantjes declared 710 ozs., value £3,016 taken from reserve. *Jupiter added 675 ozs., value £2,867, to reserve. *Nourse Mines declared 587 ozs., value £2,493, taken from reserve. *Robinson Deep added 886 ozs., value £3,761 to reserve. *Simmer and Jack added 600 ozs., value £2,548 to reserve. *Simmer Deep added 334 value £5,419 to reserve. *Ferreira took 2,470 ozs., value £1,042 from reserve. *New Modder took 9,362 ozs., value £39,767, from reserve. *Sub-Nigel added 100 ozs., value £425, to reserve. *Transvaal G.M. Estate took 1,361 ozs., valued £5,781 from reserve.

Rand Mines Group.

The following are the results of crushing opeartions of the Eckstein companies of the Rand Mines, Ltd., for March:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	32,000	19/ 0	14,473	£30,195
New Modder... ...	180	7	48,750	21/ 1	20,371	33,439
City Deep...	160	9	40,030	20/ 9	16,047	21,230
Village Deep... ...	180	6	51,200	22/ 0	18,377	25,809
Village Main... ...	220	6	37,000	20/ 9	15,979	28,083
Ferreira	80	3	22,490	15/11	7,376	12,208
Robinson	250	6	46,700	16/ 9	24,982	65,633
Bantjes	65	3	22,930	24/ 9	8,186	5,710
Totals & average	1165	45	301,100	20/ 1	125,791	£222,307

Reserve Gold Declared.—Modder B, 5,828 ozs., value £24,451; New Modder, 9,362 ozs., value £39,280; Village Deep, 5,900 ozs., value £24,755; Village Main, 1,192 ozs., value £5,000; Ferreira, 2,470 ozs., value £10,364; Robinson, 10,556 ozs., value £44,290; Bantjes, 710 ozs., value £2,979; totals, 36,018 ozs., value £151,119.

Totals.—Modder B, 29,301 ozs., value £85,149, profit £54,646; New Modder, 29,733 ozs., value £124,681, profit £72,719; City Deep, 16,047 ozs., value £67,252, profit £21,230; Village Deep, 24,277 ozs., value £101,773, profit £50,564; Village Main, 17,171 ozs., value £71,977, profit £33,083; Ferreira, 9,846 ozs., value £41,272, profit £22,572; Robinson, 35,538 ozs., value £149,098, profit £109,923; Bantjes, 8,896 ozs., value £37,157, profit, £8,689; totals, 161,809 ozs., value £678,359, profit £373,426.

The declared estimated monthly profits for 1912 are:—January, £221,326; February, £213,242; March, £373,426.*

*Including £151,119 special declaration of reserve gold.

The following are the results of crushing operations of the subsidiary companies of the Rand Mines, Ltd., group for March:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	65,200	17/ 8	22,388	£36,217
Geldenhuis Deep .	300	7	58,960	23/11	19,470	10,762
Nourse Mines ...	260	7	53,000	22/ 0	19,052	21,156
Ferreira Deep ...	160	4	33,950	22/ 9	18,187	37,596
Crown Mines ...	660	26	161,500	18/ 3	60,711	106,445
Durban Rood. D..	100	3	25,140	23/11	8,482	5,430
Totals & average	1780	51	397,750	20/ 4	148,290	£217,606

Reserve Gold Declared.—Rose Deep, 6,125 ozs., value £25,700; Geldenhuis Deep, 409 ozs., value £1,717; Nourse Mines, 587 ozs., value £2,465; Crown Mines, 4,821 ozs., value £20,243; totals, 11,945 ozs., value £50,125.

Totals.—Rose Deep, 28,513 ozs., value £119,664, profit £61,917; Geldenhuis Deep, 19,897 ozs., value £83,273, profit £12,479; Nourse Mines, 19,639 ozs., value £82,361, profit £23,621; Ferreira Deep, 18,187 ozs., value £76,349, profit £37,596; Crown Mines, 65,535 ozs., value £274,701, profit £126,688; Durban Roodepoort Deep, 8,482 ozs., value £35,550, profit £5,430; totals, 160,255 ozs., value £671,898, profit £267,731.

The declared estimated monthly profits for 1912 are:—January, £206,122; February, £209,989; March, £267,731.*

*Including £50,129 special declaration of reserve gold.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of March of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ...	320	7	73,800	20,847	£47,139
Robinson Deep	230	5	55,500	19,677	37,351
Knights Deep	270	6	60,600	12,084	17,633
Simmer East	130	3	31,600	6,910	5,213
Simmer Deep	115	9	45,500	9,919	4,037
Jupiter	105	6	40,650	9,668	6,791
Luipaardsvlei	60	3	17,190	3,561	1,180
Sub Nigel	30	1	4,568	1,820	846
Totals	1260	40	329,408	84,486	£120,190

Reserve Gold.—Simmer and Jack, 1,855 ozs.; Robinson Deep, 4,552 ozs.; Simmer Deep, 334 ozs.; Jupiter, 675 ozs.; Sub Nigel, 200 ozs.; total, 7,616 ozs.

The "total profit" shown above includes sundry revenue, viz.: Simmer and Jack, £1,500; Robinson Deep, £349; Knights Deep, £620; Simmer East, £57; Simmer Deep, £567; Jupiter, £272; Luipaardsvlei, £1,086; Sub Nigel, £313; total, £4,764.

Luipaardsvlei.—Total profit also includes £15 net proceeds from 207 ozs. of gold from accumulated slimes.

Simmer and Jack East.—The grade of ore worked during the month of March was above normal.

The Albu Group.

The following are particulars regarding the March operations of the producing mines of the General Mining and Finance group:—

Company.	Stamps.	Tube Mills.	Tons Crushed.	Total Cost.
Aurora West	60	—	12,352	£12,127
Cinderella Consolidated ...	75	3	17,280	22,404
Meyer and Charlton	75	2	14,290	12,735
New Goch	120	4	25,225	23,726
Roodepoort United	50	3	30,247	26,785
Van Ryn	125	6	39,700	30,241
West Rand Consolidated ...	100	4	28,500	30,753
Totals	605	22	167,591	£158,771

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	19/ 7·6	£14,485	£2,358
Cinderella Consolidated ...	25/ 11·1	27,431	5,027
Meyer and Charlton	19/ 9·8	29,829	17,094
New Goch	18/ 9·7	27,691	3,965
Roodepoort United	17/ 8·5	30.891	1,106
Van Ryn	15/ 2·8	55,291	25,050
West Rand Consolidated ...	21/ 6·9	34,930	4.177
		£220.548	£61,777

The monthly gross profits for 1912 are:—January, £62,769; February, £48,400; March, £61,777.

Goerz Group.

The results of operations of the crushing mines comprising the Goerz group for the month of March are as follows:

COMPANY.	STAMPS.	TUBES.	TONS.	VALUE.	PROFIT.
May Consolidated ...	100	—	12,160	£16,045	£6,090
Princess Estate ...	50	5	17,537	22,605	—
Lancaster West ...	100	3	21,820	23,800	1,032
Geduld Proprietary .	50	2	14,670	19,242	4,109
Totals	300	10	66,187	£81,692	£11,231

At the Princess Estate there was a net loss of £1,407.

Barnato Group.

The following are the details of operations for March on the producing mines of the Barnato group:—

COMPANY.	STAMPS.	TONS.	REVENUE.	PROFIT.
Consolidated Langlaagte .	140	21,193	£29,766	£8,334
Ginsberg	80	13,988	20,962	6,300
Glencairn	160	18,078	15,892	2,519
New Primrose	160	21,000	34,265	17,019
New Rietfontein	120	16,342	21,317	4,076
New Unified	60	10,820	16,890	4,704
Quest G.M. Co.	30	3,066	3,170	768
Witwatersrand G.M. Co..	220	39,020	46,981	17,512
March totals	970	146,507	£189,243	£61,223
February totals ...	970	134,296	£171,126	£58,273

The monthly gross profits for 1912 are:—January, £59,227; February, £58,273; March, £61,223.

Neumann Group.

The following are particulars of the results achieved by the crushing companies in this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Wit. Deep	38,300	£54,800	£17,503
Wolhuter	30,050	40,641	15,006
Consolidated Main Reef ...	21,700	30,115	8,573
Main Reef West	15,571	26,183	8,619
Knight Central	23,720	25,755	2,712
Treasury-cum-Jumpers ...	—	—	243
Total for Group			£52,686

Reserve Gold.—Wolhuter, 2,853.227 fine ozs.; Consolidated Main Reef, 352.710 fine ozs.

MINING MEN AND MATTERS.

Mr. Ross E. Browne, so well known on the Rand for his exhaustive examination of deep level working conditions, has recently undergone an operation in America, and is now recovering.

* * * *

The President of the Anglo-American Club, of Freiberg, desires it to be made known that he is anxious to obtain the addresses of old graduates of the well-known Saxon mining academy.

* * * *

Mr. J. E. McGuire, formerly manager of the Jupiter Mine, and more recently consulting engineer in Rhodesia to S. Neumann and Co., has been appointed acting manager of the Robinson Deep during the absence on leave of Mr. J. J. Wessels.

* * * *

The annual dinner of the old students of the Royal School of Mines will take place this year on Wednesday, June 12, at the Imperial College Union Club, Prince Consort Road, South Kensington. Mr. William Frecheville, A.R.S.M., will occupy the chair.

The German Diamond Regia Profit.

The annual report of the German Diamond Regie shows a net profit of 837,123 marks for the past year. A dividend of 10 per cent. has been declared.

Victoria Falls Power Co. Second Debentures.

The Victoria Falls and Power Co., Ltd., announces that in view of the rapidly growing demand for power it is proposed to create two millions sterling second debentures. For the present the company will issue a million at 5½ per cent., in order to extend the plant.

A NEW NON-CORROSIVE AND BULLET-PROOF METAL.

Its Composition, Properties, and Commercial Possibilities for the Mines.

[By Prof. Gaston Jacquier, B.Sc., Patentee.]

Some years ago I discovered a composition, which I have named Argilite, having the following properties:—1st, resisting sulphuric acid, cyanide of potassium, phospheric acid, arsenic-sulphide, ammonia-gas, nitric acid, at the ordinary temperature, dry or damp atmospheric air; 2nd, able to resist the heaviest pressure of air and water; 3rd, as hard as steel; 4th, not expensive now; 5th, bullet proof. Argilite is intended for the manufacture of pipes and tubes, armour plate, and to replace the iron pipes and tubes used underground in the mines and cyanide works, all chemical works, etc., which are worn out in a few months by the corrosive action of the water percolating through the shafts and drives and from cyanide tanks. The metals hitherto known to fulfil the conditions stipulated above are very rare and expensive. I have established the fact that aluminium was the only inexpensive metal up to now that has some of these properties required. But pure aluminium has great defects, as it is friable, soft, and with no power of resistance to pressure, and very porous. The problem to obtain pure cast aluminium, not brittle or porous, has not yet been solved. These different defects can only be remedied by alloying it with other metals. When I first started experimenting with aluminium in 1889 the price was £2,200 per ton. Two years after it dropped to £500, and now the quotation is only £54 per ton.

Composition of the New Metal.

I must state that aluminium is a very peculiar metal, seeing that less than ·02 per cent. of any other metal mixed with it completely changes its original properties. I took advantage of this peculiarity in my use of three other metals which would by their own properties remedy this defect. The composition of my alloy is as follows:—Aluminium, 90 per cent.; bismuth 2 per cent.; copper 6 per cent.; silicium (*). 2 per cent. Why I used bismuth: I have to explain that cast-aluminium is porous; I therefore used bismuth, this metal having the remarkable property of expanding in cooling, that when melted with aluminium it fills up the pores as the cast alloy cools; an ingot of the alloy cut in two has the appearance of the finest steel. The breaking strength of bismuth being very great in comparison to other metals, this naturally adds to the strength of the aluminium. Why I used the copper: Copper is added to give it the strength of steel, but the employment of this metal diminished to a certain extent the non-corrosive property of the alloy. Why I used silicium: To counteract this defect I was compelled to find still another metal with great resisting power to corrosive action; therefore I used silicium, and found it suitable in perfecting my alloy.

Its Commercial Possibilities for the Mines.

Generally speaking, in the commercial prospects of a new metal the first thing to be considered is its cost compared with other metals fulfilling the same purpose. Its advantages: 1st, of resisting corrosive action; 2nd, resistance to pressure; 3rd, its hardness; 4th, its lightness. All these qualities have been of secondary consideration, and, therefore, I will prove that the new metal will not be dearer than the other metals—cast steel, brass, lead—as used till now on the mines and dynamite factories, etc., for pipes, tubes, taps, and similar purposes.

Cost Price of the New Metal per Metric Ton.

In following the proportions of each of the metals composing the alloy mentioned above, I arrive at the cost price roughly, as £68 per metric ton:—

Metals	Cost per Metric Ton.	Percentage.	Weight of Metal per Ton,	Value of each Metal.
Aluminium ...	£51	90	900k	£48 12 0
Bismuth ...	7/- per lb.	2	20k	15 10 0
Copper ...	£55	6	60k	3 5 0
Silicium ...	£30	2	20k	0 12 0
				£67 19 0

Comparison of Cost Price of the New Alloy.

With cast steel of the same resistance power, brass, and lead, the specific gravity of the new alloy being 8 = 1·0; cast steel, 7·8 = 2·5; brass, 9·0 = 3·0; lead, 11·5 = 1·0. For the same length and strength of pipes, for instance, it will be necessary per ton of the new metal to use 2½ tons of cast steel at £30 per ton (£70), 3 tons of brass at £56 per ton (£168), 4 tons of lead at £16 per ton (£64), to produce the same quantity of material. The prices of copper and aluminium are maintained at this high price only by Trusts, particularly aluminium, of which the cost price at the factory is only £20 per ton.

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[*] Silicium is the most abundant element known, but, like aluminium, it does not occur in a free state. Ten years ago metallic silicium was a comparatively rare substance, and was classed as a laboratory curiosity; by a close study of its manufacture Mr. Heroult, with his electric furnace, has placed it among the cheapest commercial metals. I use the term silicium for designing the pure metal extracted from Silica, because the word Silicon, used in some chemistry books, means an entirely different body, *vide* A. O. Wurtz Dictionary of Chemistry.

The following additional regulations, under section four of the Miners' Phthisis Allowances Act, 1911, are published:

24. The Government Mining Engineer shall, within one month after the date when this regulation was first published in the "Gazette" furnish to the Board a statement showing the aggregate number of white persons employed underground in each of the mines specified in these regulations during each month of the two years ending the 31st day of March, 1912, or the portion of such two years during which there was production or development on such mine. In the case of any such specified mine as belongs to a company formed by the amalgamation of two or more previously existing mining companies, the number of white persons who were employed underground by those companies shall be added together for the purpose of this regulation.

25. The Board shall levy an amount of fifteen thousand pounds sterling from the owners of all such mines and shall assess the amount to be paid in respect of each mine in proportion to the aggregate number of persons so employed thereon as shown in the statement mentioned in the last preceding regulation, and the provisions of regulations twenty-one and twenty-two shall apply to the levy made under this regulation and any sum already paid to the Board by the said mineowners over and above the amount of the levy made under the regulations published under Government Notice No. 879 of 1911 shall form part of such levy.

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THE WEEK IN THE SHAREMARKET.

A Holiday Week—Business Quiet—Firm Undertone.

The holidays, followed by the Agricultural Show, have not favoured sharemarket activity this week. The better tendency noticeable on Tuesday was checked by some selling from Paris, and this, in turn, was counteracted by the record output and big improvement in the labour supply. Labour, indeed, is promising particularly well for the winter months, and were it not for the uncertain nature of the Government legislation to be dealt with during this Session, the outlook for the industry would be bright. The latest cables from London, however, are hopeful, and it may be that some improvement may come from that quarter even now when least expected.

	* Friday, 5th	* Sat., 6th	* Monday, 8th	* Tuesday, 9th	Wed., 10th.	Thurs. 11th.
African Farms ...	...	..	...	17 3B	17 6	17 3B
Adair-Usher Process	...	..	...	2 0S	1 6S	1 6S
Aurora West ...	...	.	..	7 6B	7 6B	7 6B
Apex Mines ...	..	...	...	33 6B	...	...
Bantjes Consolidated	..	...	...	24 6B	24 9B	24 9B
Benonis	...	..	...	6 0B	...	6 0B
Bushveld Tins ...	...	...	...	0 10B	0 9B	...
Brakpan Mines ...	...	...	...	60 0B	61 0B	62 0
City and Suburban ...	..	...	..	50 9	51 0B	51 6B
City Deeps	...	...	...	53 6B	55 6B	...
Cloverfield Mines ..	...	..	...	5 6	5 6B	5 6
Cons. Langlaagtes ...	...	...	...	22 3	23 3	23 0B
Cons. Main Reefs ...	...	...	...	19 0B	19 3	19 3B
Clydesdales	...	...	..	...	10 0B	...
Cinderella Cons. ...	...	...	...	...	...	21 6B
Coronation Freeholds	...	...	...	..	0 6B	0 7B
Con. Investment ..	...	...	...	23 0B	23 3B	23 0B
Concrete Cons. ...	...	...	...	11 0B	11 0B	..
East Rand Cent. ...	...	...	...	8 0B	8 0B	8 0B
East Rand Coals ...	...	...	...	2 5B	2 5B	2 5B
East Rand Deeps ...	...	...	...	2 6S	2 8	3 0S
East Rand Props. ..	...	...	...	64 3	64 0B	64 9B
East Rand Deb. ...	..	...	...	£94½	£94 10s	£93
Eastern Gold Mines	...	...	...	2 2	2 8B	2 0B
Govt. Areas... ...	...	...	...	24 6B	25 3B	25 9
Glencoe (Natal) Colls	...	...	.	6 0B	6 0B	...
Glynn's Lydenburgs	...	...	...	30 0S	...	28 0
Glencairns	...	..	...	...	...	4 0B
Ginsbergs	...	...	...	29 6	29 6B	30 0B
Geduld Props. ...	...	...	...	...	...	22 6B
Jumpers	...	...	..	...	9 0B	9 0B
Jupiters	...	...	...	12 0	11 0B	11 9S
Kaalfontein Diamonds	...	...	..	0 6B	0 8B	..
Klerksdorp Props. ...	...	...	...	3 4B	3 4B	3 4B
Knight Central ...	...	...	...	14 9B	14 9B	14 9B
Lace Props.	...	...	...	3 6	3 6B	..
Lydenburg Gold Farms	...	...	...	8 7B	8 8	8 9
Main Reef Wests ...	...	..	...	28 0B	29 0B	29 0B
M.R. West Deben ..	...	...	...	£98½	£98½	£98½
Modder B's	...	...	...	54 6B	55 0B	53 3B
Midas Deeps ...	...	...	..	1 2B	1 2B	1 2B
Middelvlei Estates...	...	...	...	2 0B	2 1B	2 1B
Modder Deeps ...	...	...	...	26 3B	26 9B	27 6B
Meyer and Charltons	...	...	...	85 0B	86 0B	...
Natal Nav. Colls ...	...	...	...	15 9B	16 0B	...
New Eras	...	...	...	7 0	7 3B	7 3B
New Kleinfonteins ..	...	...	...	30 0	30 3	30 6B
New Rietfonteins ...	...	...	...	11 0	11 3B	11 3
New Unifieds ...	...	...	...	16 0B	16 9B	...
New Boksburgs ...	...	...	...	1 6B	...	1 6
Orange Diamonds ..	...	...	...	1 9B	1 9B	1 11B
Pretoria Cement Co.	...	...	...	50 6	51 0B	51 9
Potchefstroom Est....	...	...	...	1 6B	1 6B	1 6B
Paardekraal Estates	...	...	...	1 0S	0 9B	1 0S
Premiers Preferred	..	...	...	...	£8½	...
Rand Nucleus ...	...	...	...	3 3B	3 3B	3 3P
Randfontein Estates	...	..	...	31 9B	32 6B	32 6
Randfontein Deeps...	..	...	...	3 6B	3 9B	...
Rooiberg Minerals ..	..	..	...	30 3	20 3B	31 3
Rand Collieries ..	...	...	...	7 6B	7 6B	...
Rand Klip	...	...	...	5 5	5 5B	5 6B
Ryan Nigels ..	...	...	...	4 0	4 0B	4 0B
Rood. Durban Deeps	...	...	...	...	...	23 0B
Salisburys	...	..	...	2 6B	2 6B	2 6B
Simmer Deeps ...	...	...	...	4 0B	...	4 0B
South African Lands	...	...	...	4 8B	4 8B	4 8B
S. Randfontein Deeps	...	...	...	3 6B	3 10B	4 0B
Sub Nigels	...	..	...	6 3B	6 3B	...
S. A. Breweries ...	...	...	...	39 0B	39 0B	39 6B
Springs Mines ...	...	...	...	11 9B	12 9B	12 0B
Trans. G.M. Estates	...	...	...	...	45 0B	45 0S
Temple Tins	...	...	...	...	2 9B	...
Trans. Coal Trusts...	...	...	..	40 0B	39 3B	40 0
Tudors	...	...	...	...	2 6S	2 0S
Trans. Cons. Lands	...	...	...	...	37 0B	...
Van Ryn Deeps ...	...	...	...	8 0B	8 0B	8 3S
Village Deeps ...	...	...	...	43 3B	43 3B	43 6B
Vogel. Cons. Deeps...	...	...	...	1 6	...	1 9B
Witwatersrands ...	...	...	...	57 6B	58 6B	...
Wolhuters	...	...	...	21 0B	22 0B	23 0
Witbank Collieries...	...	...	..	41 0B	42 1B	..
Wit. Deeps	...	..	...	54 6B	...	...
West Rand Est. ...	...	...	...	...	3 3B	4 0S
Zaaiplaats	...	...	...	46 0B	48 0S	...

B Buyers. S Sellers.

Hay G.M. Co.

RECENT RETURNS UNSATISFACTORY.

The affairs of the Hay Gold Mining Co. are exciting much attention in Rhodesia. It seems quite clear from recent returns that something is radically wrong at the property, but in the absence of official information one cannot accurately determine the trouble. The February output analysis sheet shows that ten stamps and one tube mill were at work on the property for 25 days, crushing 2,347 tons of ore, the duty per stamp per day being 9.29 tons. The mill yield was 170 ozs., valued at £720, being at the rate of only 6s. 1d. per ton. The revenue from the sands plant was much better—524 ozs. from 2,347 tons, but the total return working out as it does at not more than 694 ozs. is distinctly disappointing. The January returns were very similar—2,174 tons milled yielding only 213 ozs., and tailings 574 ozs. These are very different returns to those secured some little while ago. They compare particularly badly with the initial operations of the Hay Syndicate, when with five stamps at work the primitive plant obtained £20,609 from 7,157 tons of ore, 4,907 tons of tailings yielding £8,840. It may be recalled that a new plant was recently got to work at this Mazoe property, and it may be that difficulties more than those initial troubles, which are incidental to the working of a new equipment, have been encountered. Perhaps the ore has become of a more refractory nature, or else the grade of the mine as a whole has deteriorated. This is very probably the real reason. The Hay Gold Mining Co., it may be recalled, was floated under London and Rhodesian Mining and Land Co. auspices in 1910, with a capital of £155,000.

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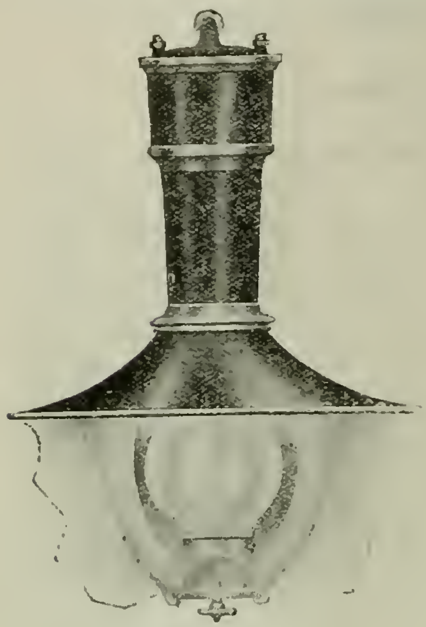

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Electrical Notes.

Cutting the Coal Bill.

At the last meeting of the Maritzburg Town Council it was reported that immediate extensions in connection with the electric supply undertaking will involve an expenditure of £7,000. This for the purpose of installing a steam turbine of the "Impulse" type, in place of three of the original 60-kilowatt reciprocating sets, which are to be dismantled. The proposed new set would be used in place of as many as four sets which have now sometimes to be used at one time, and it would take the whole load of the power station for the greater part of the day. The alteration is estimated to effect a saving of 20 per cent. on the coal bill (which last year amounted to £3,688), and at least 50 per cent. on the oil bill.

Electric Pumping.

A NOTEWORTHY ACHIEVEMENT.

Remarkable work has been achieved at the famous Tresavean Mine, near Lanner, in Cornwall. This mine, which for many years has been flooded, has been drained by means of centrifugal electrically operated pumps, and the work carried out must stand for all time as a notable testimony to the efficiency and capacity of the electric pump. Cornish pumps have been in use in Cornwall almost since the first days of steam power, and Cornishmen have always been inordinately proud of the gigantic beam engines with their ponderous pit work which, it has been claimed, have done work that no other type of pumping plant possibly could do. The draining of Tresavean has come accordingly as something of a revelation to Cornwall, and much interest thus centres in an important paper read before the Institution of Mining and Metallurgy by Mr. Cyril Brackenbury, who was in charge of the work. Each of the three boilers at the Tresavean power plant is capable of evaporating 8,000 lbs. of water per hour, and is rated at 400 i.h.p. Each of the three engines is rated at 375 b.h.p. and each alternator at 250 k.w. At a meeting of the Institution held on February 15th, Mr. Brackenbury remarked: "The quantity of water estimated to be in the mine was worked out in various ways—partly from previous pumping records, and partly from various plans of levels and stopes from which the cubic contents of the mine could be worked out. Of course we all realised that any estimate of the time it would take to unwater the property depended on the two factors—quantity of water in the mine to start with, and quantity of water flowing in during the unwatering operations. An illustration shows the actual quantities of incoming water during each month, the greatest being 954 gals. per minute, and the least 185.3 gals. per minute. Before starting the work we did not anticipate such heavy inflows of water as we had in the winters of 1909—1910 and 1910—1911, but, as has been explained in my paper, after repairing the adits from end to end and closing the dam at the 75 level, we have been in a much improved position in regard to incoming water, and this has been the case since the end of December, 1910. The average quantity for the past year—1911—has ranged from about 200 to 250 gals. per minute. Before closing it may be of interest if I say a few words regarding the latest pumping operations at the mine, which have been carried out since the paper was written. As already mentioned, the new horizontal centrifugal pump started work at the 248 level on October 13th. Soon after that, Harvey's shaft was unwatered down to the 272-fathom level, which is the lowest point in this shaft connected with the deeper workings. Arrangements were then made for placing a small sinking pump in Old East shaft, which goes down to the very bottom of the mine at a depth of 310 fathoms below adit. At the present time, March 4th, 1912, the water has been lowered down Old East shaft to a depth of 1,700 feet below adit, that is, nearly down to the 300-fathom level below which there are no old stopes. The work is being done by a small vertical piston sinking pump, driven by compressed air, which throws about 60 gallons per minute up to the 272-fathom level. A small centrifugal pump is soon to be placed at the 286 level to relieve the piston pump, which will be taken down to the bottom of the shaft. On the 272 level the water runs back to Harvey's Shaft, where it is picked up with a little additional water, and lifted to the cistern at the 248 level by means of another air-driven piston pump, good for about double the quantity of the smaller pump at Old East shaft. All the water coming in at the 248 level is collected in the cistern at Harvey's shaft, together with that delivered by the small pump from the 272 level, and it is then raised to adit by a series of three horizontal centrifugal pumps, one at the 248 level, one at the 166, and one at the 75-fathom level. It has already been mentioned that a motor-driven ram pump is soon to be installed for permanent pumping at the 248-fathom station. This pump will deliver the water in one lift to adit, or even to surface if required. The centrifugal pumps will then be kept as a stand-by in case of need. A two-stage high-speed vertical air-compressor, belt-driven from electric motor, has been installed at the 248-fathom level, and this compressor now supplies air for the two piston pumps, and can be used for supplying power to rock drills, air winches, etc. The above description of new machinery will perhaps help to illustrate the flexibility and adaptability of the electrical power plant for all kinds of purposes. Electric motive power will be, of course, particularly suitable for mill work on the surface, as soon as the mine has been brought to a regular producing stage. Mr. Brackenbury's work in the particular stronghold of its rival makes out a very convincing case for the modern electric centrifugal pump as opposed to the ponderous Cornish plant. It is hardly necessary for us to state that all the large mine pumps in use on the Rand are of electric type—the majority of three-throw pattern.

Capetown's Electric Plant.

A meeting of enrolled voters of Capetown was held last week for the purpose of authorising the Council to borrow a sum of £75,000 for the extension of the electrical undertaking. The official statement of the Council's proposal was set out in the following terms:—The purchase of the assets of the Cape Peninsula Lighting Co., Ltd. Cost of linking up the central station with the southern suburbs, including the change over from continuous to alternating current, provision of cables, switch gear, transformers and sub-stations; and, in the central station, the necessary switch gear and transformers. Extensions for Government contract, Green Point and Sea Point, Woodstock and City systems (for which a sum of £72,000 has been expended and the cost defrayed out of depreciation account, with the exception of a sum of £11,000), and contemplated extensions to meet increased demand during the current year, including provision of economiser, steam turbine, etc., the cost of which will be partly defrayed by accumulations on depreciation account during 1912 and 1913, and by reimbursements in respect of the sale of certain plant, generating stations, land, etc., in the southern suburbs, and the compensation payable for the taking over the rights within the Wynberg Municipality. The proposals were agreed to.

"S.A.M.J." ANNIVERSARY NUMBER.

Special Competitions—An Interesting Announcement.

Essay Competition.

In connection with the issue of our twenty-first Anniversary Number, which will be published in June next, four prizes, each of £3 3s., are offered for the best essays received on some aspect of—

(a) Mining;
(b) Metallurgy;
(c) Mechanical Engineering;
(d) Electrical Engineering.

One prize will be given for the best contribution received under each of the above headings. Essays must be written with special reference to the mineral industries of the Union of South Africa, Rhodesia, German South-West Africa, Portuguese East Africa, or the Katanga region of the Belgian Congo. They must be of topical and South African interest. A very wide range of subjects is thus open, and it is hoped and believed that many valuable contributions will be submitted. The winning essays will be reproduced in the Special Anniversary Number of the *South African Mining Journal*, and will thus find a place in a production which will be remarkable in the records of South African journalism. The attention of competitors is directed to the following rules of the competition:—

1. Contributions must reach this office not later than March 31st, 1912. They must be addressed: "Anniversary Department, *South African Mining Journal*, P.O. Box 963, Johannesburg, Union of South Africa," and marked "Essay Competition," in the top left hand corner.

2. Contributions must be of not more than 1,500 words in length.

3. It must be distinctly understood that the decision of the Editor and Editorial Staff of the *South African Mining Journal* and of such judges as may be asked to adjudicate will be final and absolute.

4. Under no circumstances can responsibility be recognised for the safe return of manuscripts. At the same time every endeavour will be made to secure their safe return, if a fully stamped and addressed envelope is enclosed.

5. The right is reserved to reproduce in any issue of the *South African Mining Journal* all or any of the contributions submitted. All essays reproduced will be paid for at usual rates.

Photographic Competition.

In connection with the same issue a prize of £2 2s. will be given for the best photograph illustrating some aspect of: (a) Mining; (b) Metallurgy; (c) Mechanical Engineering; (d) Electrical Engineering. Photos must be of South African interest and must be of topical value. The winning photograph will be published in the Special Anniversary Number of the Journal.

The attention of competitors is directed to the following rules:—

1. Photographs must reach this office not later than March 31st, 1912. They must be addressed "Anniversary Department, *South African Mining Journal*, P.O. Box 963, Johannesburg, Union of South Africa," and marked "Photo Competition" in the top left hand corner.

2. The size and shape of photos submitted is left entirely to competitors.

3. It must be distinctly understood that the decision of the Editor and Editorial Staff of the *South African Mining Journal* and of such judges as may be asked to adjudicate will be final and absolute.

4. In no case can photos submitted in this competition be returned, and the right is reserved to reproduce all or any photos received in any issue of the *South African Mining Journal* without payment.

In all cases in which photos are reproduced in connection with this competition the name of the photographer will be acknowledged.

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Clocolan Water Scheme.

Tenders are invited for the erection and completion of a water scheme at Clocolan, according to, plans, specifications, etc., to be seen at the office of Mr. P. P. J. Minnaar, Town Clerk.

* * * *

Natal Statistics.

The following are particulars of the tonnages of traffic forwarded, received, and transhipped at Durban and Point railway stations for the years 1911 and 1910:—1911: Forwarded, 629,283 tons; received, 2,269,873 tons; transhipped, 115,187 tons. 1910: 655,328 tons; received, 2,250,152 tons; transhipped, 82,018 tons. The following is a table giving the number of insolvent estates in the Province of Natal whose surrender was accepted, and of assigned estates registered in the Province, and the amount of deficiency as shown in the schedules:—1911: Number, 81; liabilities, £108,666; assets, £66,998; deficiency, £41,669. 1910: Number, 91; liabilities, £133,129; assets, £85,095; deficiency, £48,033. Assigned estates, deeds of composition, etc.:—1911: Number, 60; liabilities, £74,853; assets, £43,177; deficiency, £13,676. 1910: Number, 50; liabilities, £53,321; assets, £31,483; deficiency, £21,838.

* * * *

Natal Coal in 1911.

The following figures give the distribution of the Natal coal output for 1911 and 1910:—1911: Coal bunkered by vessels at Durban, 1,264,800 tons; coal exported from Durban by sea, 356,650 tons; coal exported from Natal Province overland, 334,700; coal used on railways and otherwise, 443,850; total, 2,400,000 tons (2,240 lbs.). 1910: Coal bunkered by vessels at Durban, 1,246,115; coal exported from Durban by sea, 323,344; coal exported from Natal Province overland, 155,356; coal used on railways and otherwise, 571,872; total, 2,296,687. Bunkering at Capetown with Natal coal is still growing, and a large increase on 1911 will have to be recorded for 1912. Taking the months of January and February for comparison, the tonnages are:—1911: For Cape Railways—January nil, February nil; for other consignees—January 22,672, February 18,241. 1912: For Cape Railways—January nil, February nil; for other consignees—January 23,112, February 46,219.

* * * *

Estimates of Expenditure.

The Estimates of Expenditure for 1912-13 from loan funds, laid on the table of the House of Assembly last week, show that the railway and harbour vote totals £4,910,000; and the public works vote £628,601, which is largely for works already in progress. New amounts are set down for Government House, Capetown, £5,000 towards the agricultural school at Cedara; £25,000 for the Central Police Depot, Johannesburg; £5,000 towards the Agricultural School of the Free State; £30,000 towards the Alexandra Hospital, Maitland; £100,000 for school buildings of the Transvaal; £12,000 for school buildings in the Free State. The total for telegraphs and telephones is £370,339. The agricultural vote is £42,000, comprising £5,000 for the erection of vermin proof fencing for the Cape; £25,000 for the construction of dipping tanks; £6,000 for Natal fencing loans; and £6,000 for loans to creameries and other agricultural projects. The vote for lands and settlements totals £361,500, including the following amounts for new projects: £16,000 for the purchase of land for an agricultural school for the Free State; £35,000 for advances to settlers; £200,000 for the purchase and laying out and improvement of land for settlement purposes; £100,000 for the purchase of land for irrigation schemes. The vote for irrigation totals £364,000, including £25,000 for loans to labour colonies, £150,000 for minor irrigation loan to farmers, and public bodies; £100,000 for similar large loans; £10,000 for minor irrigation schemes; and £30,000 for water boring on Crown lands. The sum of £232,500 is set down for local works and school loans, while the land bank vote amounts to £410,000, including £100,000 for a land bank for the Union. The Provincial Estimates were also tabled, and the abstract totals as compared with last year's amounts are as follows: Cape Province: General administration, £36,826—increase, £8,608: education, £676,900—increase, £41,177; hospitals and charitable institutions, £82,488—decrease, £8,879; roads and local works, £252,849—increase, £54,960, giving a total of £1,049,603—net increase, £96,166. Transvaal Province: General administration, £37,005—increase, £749; education, £688,495—increase, £36,988; hospitals and charitable institutions, £168,301—increase, £27,506; roads and local works, £908,145—increase, £182,610, giving a total of £1,801,946—net increase, £247,853. Orange Free State: General administration, £15,783—increase, £1,958; education, £261,269—increase, £53,960; hospital and charitable institutions, £20,738—increase, £3,783; roads and local works, £334,710—increase, £103,410. Total, £632,500—net increase, £163,111. Natal: General administration, £21,100—increase, £1,748; education, £181,152—increase, £18,813; hospitals and charitable institutions, £34,600—increase, £3,514; roads and local works, £373,792—increase, £109,403; total, £610,614—net increase, £133,478.

* * * *

Two Months' Trade.

The monthly Customs statements for the first two months of the current year show, on comparison with the corresponding period of last year, a steady expansion both of imports and exports:—Two months, 1912: Imports, £6,462,197; exports £10,373,058. 1911: Imports £6,056,034; exports, £8,532,109. Increase: Imports, 406,163; exports, £1,840,949. The increase in the case of imports is at the rate of 6.7 per cent., and in the case of exports 21.5 per cent. Of the increase in exports, gold is responsible for £1,047,000, and diamonds for £438,000, leaving a sum of £355,000 representing the increased value of other classes of exports during the two months' period. Of this balance, £52,000 is represented by coal. During the two months export of coal increased by 56,000 tons, while the value per ton was approximately a shilling higher than last year, doubtless as a result of the strike, which in January and February was impending. During March our coal exports should show a very greatly increased export at a still greater advance in price. The exports in January and February amounted to £1,161,001, an increase of £295,000. Mohair exports show a modest increase for the two months of about £16,000. The ostrich feather export, on the other hand, is not apparently in a very satisfactory state. The two months' exports show a decline in value of about £25,000. This in itself might be merely a temporary fluctuation, but the significant point is that the quantity exported shows a considerable increase, and that the average price obtained per lb. seems to have fallen from about £3 3s. at the beginning of last year to £2 7s. 4d. this year. A striking feature of the two months' exports is the gratifying evidence of the growth of the whale oil industry. During the period in review the exports were valued at £16,802, as against £1,331 last year. The export of bark and buchu leaves is beginning to figure prominently in the tables, but the maize export is still considerably below the figures of the previous year. There are no specially notable features on the import side of the account, save perhaps the fact that foodstuffs continue to show a decrease, which may be interpreted as evidence that we are feeding ourselves on an increasing scale. The Rhodesian statistics bear evidence to steady progress. Imports for the two months amounted in value to £474,742, and exports to £541,085. It may be noted that Rhodesia is now consuming South African produce, imported from the Union, at the rate of half-a-million sterling per annum.

Transvaal Manufacturers' Association.

The Transvaal Manufacturers' Association has issued a circular stating that the Commission on Commerce and Industries has now been issued and has been for some weeks before the public. The report discusses most of the industrial problems of the Union and makes detailed recommendations concerning many specified industries. There is no Transvaal industry which may not be vitally affected by the legislative action to be taken on the Commission's recommendations. I write to urge you in your own interest and in the interest of your fellow manufacturers to make yourse'f acquainted at your earliest convenience with the details of this report. Copies are available at the office of the association for your perusal. The coast manufacturers' associations are holding a congress at Capetown to discuss the report, with a view to representing to Parliament the respects in which it falls short of the requirements of industrialists. The general meeting of members of this association on the 15th ult. approved of the proposal that a conference of inland producers should be held at an early date in order to consider the special bearing of the report upon inland industries. For this purpose it is necessary that those actually engaged in manufacture should study for themselves the portions of the report dealing with their respective industries, and consider carefully whether their interests are sufficiently consulted.

* * * *

Union Expenditure.

A white paper has been issued containing the estimates of additional expenditure:—(1) To be defrayed from revenue funds during the year ending March 31, 1912; and (2) from loan funds during the period from March 31, 1910, to March 31, 1912. The sum total of the former estimates is £366,787, of which £156,554 is under the head of public debt, £57,500 is under the head of printing and stationery, and £43,341 is under the head of Customs and Excise. Among the items of note are:—(a) £11,000 for an expedition to Northern Africa, for the purchase of ostriches; (b) £15,000 for compensation from Miners' Phthisis Fund; (c) the amount above mentioned for public debt charges required to pay interest on Treasury bills, and for further advances; (d) £3,324 compensation to Bloemfontein, as a disrated capital, being additional amount in respect of the years 1910-11 and 1911-12; (e) £24,000, chiefly to meet under-estimate of the amount to recoup loan funds for losses on repatriation account; (f) £25,000 for the purchase of Westbrooke and Klein Schuur Estates; (g) £40,000, grant to the Imperial Government in connection with the construction of Simonstown naval dockyard. The total of the loan expenditure mentioned is £188,827, including £2,500 for the new Law Courts at Johannesburg, £1,500 for University College buildings at Pretoria; £175,000 (omitted from the estimates owing to misapprehension), for country telegraph and telephone extensions in the Transvaal; £1,500 loan for the establishment of a condensed milk factory at Parys; £3,700 to meet excess in expenditure on land settlement in the Transvaal; £1,500 for the purchase of irrigation plant in connection with Odendaalstroom Labour Colony.

* * * *

The Credit System in Rhodesia.

A striking feature of Mr. Johnson's address at the meeting of the Rhodesia Chamber of Commerce last week was the minute analysis he made of the causes which contribute to render the cost of living in Rhodesia so abnormal. Some people may take the view that Mr. Johnson was disposed to under-estimate the influence of the heavy railway rates, but however that may be, many think that this factor is of infinitesimal consequence when compared with the effect of the lax credit system obtaining in the territory, upon which Mr. Johnson laid so much stress. It is generally believed that the prices of commodities to the consumer are unduly inflated for the reason that they are made to carry provision against the bad debts to which the practice of giving unlimited credit to people of unknown stability inevitably gives rise. If false bases of conducting business have been established, it is time that the more responsible of our business houses should set to work to effect amendments. The obligation to brace up the commercial system and to close the door of opportunity to the incorrigible bad debtor is made the more imperative because the populations of the towns of Rhodesia are migratory rather than settled. Mr. Johnson spoke plainly on the matter, and we gather that his utterances on the subject received the tacit approval of some of the merchants present.

The following tenders have been accepted:—

Argus Printing and Publishing Company, Limited, Capetown, in the sum of £1,593 15s. for printing and supplying 15,000 letter bill books; W. W. Peffers, Bloemfontein, at £996, additions to nurses' cottages, Bloemfontein; A. Fairweather, Kroonstad, at £1,597, for erection of school teachers' quarters at Voorspoed, O.F.S.; Fairbridge and Wilson, Ermelo, at £581, for erection of sheep-shearing shed at Ermelo; Keating and Co., Grahamstown, at £7,800, for erection of public offices at Cradock; Barker and Smith, Pietermaritzburg, at £1,295, for erection of latrines, Pietermaritzburg College; G. B. Laffan, Pietermaritzburg, at £306 15s., for drainage system, General Post Office and Museum, Pietermaritzburg; Butler and James, Vrede, O.F.S., at £1,451 5s. 11d., for erection of post office at Vrede, O.F.S.; Mowat and Sons, Cheveley, at £3,107 6s. 4d., for erection of bridge over the White Umfolosi River, Vryheid; James Thompson, Johannesburg, at £5,997, for erection of new wing to Nurses' Home and alterations to existing Nurses' Home, Johannesburg Hospital. W. W. Peffers, at £1,263, for alterations to White Male Ward, Lunatic Asylum, Bloemfontein; J. Ingram and Co., Pretoria, at £2,799 9s., for erection of bridge over the Blesbokspruit, Heidelberg; Nelson and Co., Fietpotgietersrust, at £1,310 10., for erection of police buildings at Blauwberg, Zoutpansberg; C. L. Schuddink, Seapoint, Capetown, at £5,645 5s. 6d., for supply and erection of steelwork for bridge over Olifants River, Clanwilliam, Cape Province. Jefferson, Limited, Johannesburg, at £365, for repairs to Magistrate's Court, Government Square, Johannesburg; G. McLauchlan, Johannesburg, at £640, for repairs to General Post Office, Johannesburg; A. Creighton, Bloemfontein, at £2,465, for erection of isolation hospital and gymnasium, Grey College, Bloemfontein; Cruickshanks & Co., Port Elizabeth, at £4,848, for erection of additional accommodation, New Brighton Location, Port Elizabeth; H. Bryan, Brandfort, at £637, for erection of school at Virginia, O.F.S.; A. Creighton, Bloemfontein, at £1,650, for erection of new ward and single rooms, Lunatic Asylum, Bloemfontein; J. L. Mauritzen, Vryheid, at £947 17s., for erection of gaolers' quarters at Vryheid; Jefferson, Ltd., at £410 10s., for repairs to Marshall Square police offices, Johannesburg; Murray & Stewart, Capetown, at £8,711, for erection of bridge over Berg River, Hermon, Paarl; G. McLauchlan, at £78 10s., for repairs to General Post Office, Johannesburg; Crawford & Lobban, Turffontein, Johannesburg, at £183, for repairs to police post at Van Wyk's Rust.

INVESTORS' DIARY.

The following company meetings have been announced:—

April 17.—South Randfontein Deep.
April 25.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep; Cloverfield (Extraordinary General Meetings).
April 30.—New Era; Springs Mines; Brakpan Mines; Transvaal Coal Trust.
May 2.—Meyer and Charlton; New Goch; Roodepoort United; West Rand Consolidated.
May 3.—Cinderella Consolidated; Aurora West; Rand Collieries; New Steyn Estate; Sacke Estates.
May 8.—Roberts Victor Diamonds.
May 10.—Ferreira Deep; Ferreira G.M.; Knight Central.
May 17.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep (Extraordinary General Meetings).
May 18.—Aurora West.
May 22.—Apex Mines; New Kleinfontein.
May 23.—Benoni Consolidated; Crown Mines; National Bank (at Pretoria).
May 29.—Robinson G.M. Co.; New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.
May 30.—Village Deep.
June 4.—Ferreira G.M.
June 5.—Rand Mines.
June 21.—New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.
June 26.—Transvaal Consolidated Lands.
July 19.—Transvaal Consolidated Lands.

Contracts Open.

The Germiston Municipality invites tenders for the supply of 56 casks of Portland Cement. Tenderers to state brand of cement tendered for, place of origin, and time required for delivery. Tenders to be accompanied by copy of results of tests (April 17).

The Municipality of Boksburg invites tenders for the supply of rolling stock, converter plant, and overhead material, required in connection with trackless tramways (June 26).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of fencing material and gates (May 28).

The Chairman of the Orthodox Hebrew Congregation invites tenders for the erection of a New Synagogue (April 16).

The Town Clerk of Clocolan, O.F.S., invites tenders for the erection and completion of a water scheme at Clocolan (May 31).

The Municipal Council of Johannesburg invites tenders for the erection of fencing and gates at Ophirton Park, Johannesburg (April 24); also for printing the Mayor's Minute for the year 1911 (April 18); also for the supply of timber and galvanised iron, bricks, C.I. motor boxes, etc (April 24); also for the supply of beef, steel work, overcoats, cement, stoneware pipe fittings (April 20); also uniforms for tram officials (May 7); also chloride of lime (May 10); also mackintoshes (June 1); also spares for stone crusher (June 14).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of the following articles to the Department of Posts and Telegraphs.:—540 polished walnut backboards, 37 in. x 12 in., as per drawing No. 24 D.; 370 polished walnut backboards, 49 in. x 12 in., as per drawing No. 24 E.; 150 polished walnut backboards, 54 in. x 14 in., as per drawing No. 663. Quotations must include delivery as shown below, and must indicate time within which delivery will be effected: Capetown, backboards as per drawing No. 24 D., 140; backboards as per drawing No. 24 E., 190; backboards as per drawing No. 663, 50; Johannesburg, No. 24 D., 200, No. 24 E., 150, No. 663, 100; Pietermaritzburg, No. 24 D., 200, No. 24 E., 30 (May 1); also for the supply of horse rations to the Urban Police (Cape Division) (May 15).

The Chairman of the Tender Board, Provincial Secretary's Office, Market Street, Pretoria, invites tenders for the erection of a school for 100 pupils at Fontainbleau, Johannesburg (April 19).

The Chairman of Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for additions to Fairview Junior school Troyeville; also additions to Boksburg North School (May 3).

The Chairman of the Tender Board, Provincial Secretary's Office, Bloemfontein, invites tenders for the following services in the Province of Orange Free State: Erection of teachers' quarters at Bothaville, erection of teachers' quarters at Bnltfontein, erection of teachers' quarters at Lindley Poort, erection of teachers' quarters at Modderpoort, erection of teachers' quarters at Odendalsrust, erection of teachers' quarters at Philippolis Road, erection of teachers' quarters at Thennissen, erection of teachers' quarters at Villiers, erection of teachers quarters at Waterworks, erection of teachers' quarters at Weltevreden (May 7).

The Secretary of the Tender Board, South African Railways Headquarter Offices, Johannesburg, invites tenders for the supply and delivery of structural steelwork, required for new store at Pretoria (April 23).

The Municipal Council of Salisbury, Southern Rhodesia, invites tenders for materials to be supplied and work to be executed in the Makabusi Storage Reservoir, including earthen embankment, overflow weir and channels, concrete valve tower and footbridge, etc. (April 16).

In Liquidation.

Transvaalsche Handels Maatschappij; the second meeting advertised for April 4th will be held on April 5th.

Waterberg Gold, Land, Investment, and Exploration Syndicate, Ltd., February 20th; a separate meeting of creditors and contributories will be held before the A.R.M., Johannesburg, on April 16th.

Coliseum, Ltd., The, March 1st; a separate meeting of creditors and contributories will be held before the A.R.M., Johannesburg, on April 16th.

Sterkspruit Gold Mining Co., Ltd., The; first and final liquidation and distribution account, Master's office, Pretoria, and R.M.'s office, Carolina, for fourteen days from March 29th. S. J. van Wyk, liquidator.

Rowden Diamond Mines, Ltd. (voluntary), February 13th; a special meeting of shareholders will be held on April 23rd at Norwich Union Buildings, Fox Street, Johannesburg. F. E. Turpin, liquidator.

Myers, Ltd., W. (voluntary), March 25th; a meeting of creditors will be held at 94, Standard Bank Chambers, Commissioner Street, Johannesburg, on April 15th. M. Myers and J. Arenstein, liquidators.

Transvaal Real Estates, Ltd., Johannesburg; first and final liquidation and distribution account, Master's office, Bloemfontein, for fourteen days from March 30th. W. E. Bleloch, official liquidator.

The Eileen Alannah Meeting.

The first ordinary meeting of the Eileen Alannah Mining Company, Ltd., was held in London in mail week, Sir John Willoughby presiding. In the course of his speech the Chairman remarked:

Taking into consideration that at the time of the formation of this company, as a result of only some twelve months' development, ore to the value of approximately half a million had been already exposed in one small section of the property, and in view of the immense possibilities of the undeveloped sections of the remainder, constituting the greater part of the whole, in the Board's opinion the capitalisation, relatively speaking, was moderate. The results of further development since that date generally tended to corroborate this view. Although the ore was somewhat refractory, it presented no difficulties of treatment. Arrangements were being made to shortly treat a few thousand tons of ore at the experimental plant of the Cam and Motor, and if it be then decided to adopt a roasting process, the working costs, including development, according to Mr. Ackermann's estimate, would only amount to 19s. 6d., as against 17s. 6d. per ton without roasting. In any case, he thought they might figure on a certain extraction of at least 87½ per cent., and possibly more. Since November 30 the small 10-stamp mill had been closed down, while the further development of the mine was being pushed as rapidly as possible, and while continuing to work on the first discovered pay-shoot, attention had also been turned to other sections of the property, with very encouraging results. As regarded the western pay-shoot, the main incline shaft had been sunk a further 280 feet, from the 4th to beyond the 6th level, the latter being located at a depth of 670 feet, from the surface. This shaft was now being continued to the 7th level, and had already reached a depth of .730 feet. The 5th level was being opened up, and driving at the 6th level had also recently commenced. The total ore reserves developed on the west pay-shoot to date amounted to 188,404 tons, of an estimated value of £550,000. Mr. Ackermann, after a personal inspection of the new strike, had reported that he was greatly impressed with developments, the reef on the new strike being solid and between well-defined walls, and that, without doubt, it was a very important strike. In view of this meeting, they instructed the local management to telegraph the latest information to date, and the following details had been received from Mr. Ackermann by cable, dated March 18, which read as follows:—"Fully developed ore reserves end of October estimated by me 159,824 tons, average 13.5 dwts. Ore reserves fully developed up to end of February 178,404 tons, average 14 dwts., and 10,000 tons, average 11 dwts., partially developed, giving a total gold content of £550,000. The small increase due to developments on No. 5 level being carried out in contracted area of ore body. I consider ore body to be deep seated, and look for lateral improvement in depth. Reef incline shaft No. 6 level 10 feet wide carrying poor values; sinking now being pushed to No. 7 level. The high grade ore met with on the No. 5 level has been reached at the No. 6 level face assaying 12 dwts. per ton over 72 ins. In the No. 2 level east drive, at a point 950 feet east of incline shaft, new chute has been met with and has been driven 60 feet; average for this distance, 11 dwts. over 72 ins I consider this very important development. Have commenced driving No. 4 level east to develop this body at depth. Estimate further 450 feet driving will have to be undertaken. Egglantine blocks: New incline shaft sunk 45 feet from a point about 1,200 feet east of east chute. Reef at the present depth average 10 dwts. over 66 ins. Look upon possibilities (of) new work undertaking this section (of) strike (as) being very encouraging.—Ackermann." A later cable received from Colonel Heyman on the 18th inst. states that "the manager has telegraphed from the mine latest assays at the 6th level, £5 14s. 9d. over 91 ins.; £5 10s. 6d. over 79 ins. at 65 ft. and 70 ft. west of incline shaft respectively. Reef looks well in the face of drive." There being no resolution before the meeting, the proceedings then terminated.

The best "Reef Traveller" is the *South African Mining Journal.*

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Automobile Notes.

The Agricultural Show and the Motor Exhibits.

The thousands of visitors to the show now in progress must be favourably impressed with the varied nature of the exhibits and the extensive all-round improved facilities afforded in the many sections, gratifying alike to promoters, exhibitors, and spectators, reflecting, it must be said, a careful study on the part of the former, in point of the requirements of the host of exhibitors, such as successfully excludes all criticism other than favourable. The approach to the exhibition grounds is made through a startling miscellany of motor cars, from the prosaic runabout to the more luxurious landauettes and limousines, conveying evidence, if such were needed, of the popularity of the automobile. Once inside, however, the motorist and general public will find an added interest to this year's show centring in the splendid display of motor vehicles which the many agents have arranged in pleasing fashion, and the exhibitors are not slow in embracing the opportunity offering to draw the attention of the prospective purchaser to the many excellent features embodied in the respective cars to conform to this country's peculiar requirements. One is convinced by a visit to the show that a steady progress is being made towards the genuine marketing of motor vehicles through the medium of such an exhibition, and that appreciably better results can be achieved in this practical way that are possible, for instance, by the pictured catalogue, one of the chief means hitherto employed of engaging public interest in regard to the estimable qualities of the automobile.

Arriving at the motor section, the visitor's attention is first arrested, approaching from an eastern direction, by the display on Stand No. 1, where the Rover, Singer, and Minerva cars are shown, the former two being of British make, well known at Home and abroad; the latter, a car of Belgian build, popularly known, by reason of the Silent Knight engine in South Africa, and which in no way discredits the country of its manufacture. On this stand also is shown a commercial motor vehicle of the Lacre type, by the agents for the foregoing, Connock's S.A. Garage, Ltd. The exhibits of the Texas Co. of S.A., Ltd., of their high-class "Texaco" motor spirit and oils, together with the display by the Dunlop Pneumatic Tyre Co. of tyres and accessories, are to be found in proximity to the first motor stand at the eastern end. Passing on, the popular Ford cars cannot fail to interest, exhibited by B. J. Penney, who has also on show a chassis of this type fitted with a body for commercial purposes, and which reflects the excellent workmanship of this firm of coachbuilders. D. H. Saker & Co. are showing 1912 models of the Talbot, Star, Renault, Delage, and the newly-acquired Metallurgiquo, also an Albion van, for which they are the exclusive agents. As anything savouring of newness appeals to a South African community, the Metallurgique, a car of Belgian origin, provides more than a passing attraction. The Continental Tyres Co.'s stand, near by, is replete with the latest productions, in which they specialise lines too well appreciated to require much comment. The Napier and Austin agents, H. Gill & Co., occupy the next stand, showing the latest production from the British factories responsible for these types. The familiarity with which these cars are recognised by the visitors is sufficient criterion for the popularity to which they have attained. Next in order comes an exhibit of the Lacre commercial vehicle, by the local agents, the Anglo-French Garage, Ltd., who are also South African representatives of the Motobloc, the Darracq, and the Belsize. This com-

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pany also specialises in auto-carriers. It is interesting to point out that they import the Lacre chassis only, the bodies for commercial wants being exclusively built by local body-makers—a significant feature in the country's development of which more will be said on a future occasion. The Johannesburg Motor Mart, agents for the Humber, Mitchell, and Straker-Squire cars, etc., are showing some up-to-date specimens of these vehicles, the latter a 15 h.p. British car with many excellent features in point of recommendation. Michelin tyres are also shown on this stand. On the extreme west of the motor section a fine exhibit may be found, comprising the Sunbeam (to which reference is made in another article) and the famous Buick car. The latter, an American machine, has done much to disprove the familiar idea that a combination of cheapness, power, and quality seldom characterises a car. Of the Sunbeam much will probably be heard in the near future.

In another section of the show one encounters an exhibit of Overland cars, and attention is invited to a 25 h.p., complete in every detail, ticketed £300, and in support of the value offered, a sister car is shown which has been run 12,000 miles over rough Transvaal roads, ostensibly none the worse for the achievement. Messrs. Bartle and Co. are the selling agents, and have already placed three dozen locally. The Goodrich tyre, in which they specialise, and of which they carry large and assorted stocks, is also on view.

The popular motor spirits, Pegasus and Shell, are exhibited in conjunction with other Vacuum Oil Co.'s commodities, in another portion of the show.

On the whole the exhibition is by far the best yet attempted, but cannot be classed by any means as representative of the general industry, which has grown up so quickly in these parts, when one considers the absence of the famous Vauxhall and other cars which have become household words in motoring circles. In many cases orders for cars have been booked and others sold, the most gratifying feature at least from the agents point of view, and which, briefly, justifies the very commendable enterprise in the arranging of the show by the South African Society of Motor Traders.

The Lezard Shield Competition.

The competition for the Lezard Shield, to which reference was made last week, was held on the 7th and 8th inst., despite the heavy nature of the roads beyond the capital, which many indeed expected would have necessitated a postponement of the event. The outward journey, however, from Johannesburg to the objective, Warmbaths, was accomplished on the first day with comparative ease and with slight adventure; the rain, however, in the interim before the return the following day, converted the already sodden ground into veritable quagmires in places, with the inevitable result that several cars stuck fast, being extricated with considerable difficulty and attendant delay. As the rules governing the contest exacted a non-stop run from each competitor, and a minimum average of 18 miles per hour, the task of getting through was no easy matter, considering the unfavourable nature of the country traversed. It fell to Mr. S. Anderson to successfully comply with the conditions laid down, who, with his Sunbeam, weighing 3,650 lbs., accomplished the round trip of 180 miles without a stop, at an average speed of 27 miles per hour. Second place was awarded to Mr. Williams's Talbot; Mr. Penny's Ford car being next. Competitors, it should be stated, were severely handicapped throughout the greater part of the run, the road at time being extremely difficult to follow, and the detours into the bush were both unexpected and aggravating, and constituted a severe test for the very best cars.

Motoring in the Holidays.

Many motorists journeyed from Johannesburg to the various places of interest, within easy striking distance, during the holidays, which, by the way, goes to prove that the popularity enjoyed in the past by Pretoria, Potchefstroom, Heidelberg, Hentey, Vereeniging, and other Transvaal towns, is by no means languishing. Much of the attractiveness, of course, which centres around week-end and holiday resorts, such as the foregoing, is rendered possible by the efforts of the hotels and other institutions which make a special study of the requirements of visitors, and cater accordingly. When indifference, on the other hand, is displayed, as, for example, by the recent disposal of the rowing boats, which formed the chief attraction on the Vaal river at Vereeniging, by the Municipality at that place, those who cater in the public interest can hardly expect continued patronage when they tolerate, without demur, a proceeding similar to that just mentioned, which is fruitful of much disappointment to visitors.

Lessons of the Strike.

The great coal strike is not without its lessons, and, *inter alia*, will be responsible for bringing more into prominence the many advantages of the internal combustion engine, and its substitution where steam power is now employed. The possibilities of its wide adoption have been long recognised, but perhaps the really serious attention it deserves has not been bestowed until the emergency of the past few weeks demanded it. A far-reaching development, however, in the internal combustion engine will most likely follow the coal shortage experienced recently, and the future will undoubtedly see its adoption in the merchant and passenger ship service. Already the motor-driven destroyer is being contemplated by the Admiralty, and the question of marine propulsion is occupying much attention at the present time, therefore one may expect war vessels at no distant date to dispense largely with steam power. The advantages, briefly, of the substituted motive power referred to, in the case of ships, would include a great saving of space, and a consequent capability of carrying much more cargo than is now possible. Other weighty considerations are also provided by the fact that enough oil for extensive voyages could easily be carried at a cost of about one-third the price of coal, and the engine staff required on ships could be reduced by three-fourths. In addition, the long delays in starting by the use of boilers would be avoided. While the vibration of a ship fitted with internal combustion engines could be reduced to a minimum.

New Patents.

142. Albert Thomas Harris and Charlton Effingham Wollaston.—An improved spray for liquids.
143. William Cullen, Thomas Donaldson, and The British S.A. Explosives Company, Limited.—Improvements in explosives.
144. William Cullen, Thomas Donaldson, and The British S.A. Explosives Company, Limited.—Improvements in gelatinous explosives.
145. Marks Binnes, Harry Beswick, and Robert Billington.—Improvements in or relating to the wheels and tyres of motor road vehicles, velocipedes and the like.
146. Frederick Walter Bawden.—Improvements in explosives.
147. Kenneth Lancaster Graham and Frederick August Alexander.—A device to be employed on mechanical haulages to prevent wear on truck wheels, rails. sleepers, and rope, and to throw the rope outside the rails on to rollers or other similiar devices.
148 James Grant Gibson.—Improvements in tube mill liners and the like.
149. Allison Dalrymple Smith.—Improvements in automatic couplings for railway, tramway, and other similar vehicles.
150. John Whidborne Watts.—Improvements in treating complex or refractory ores, concentrates, and the like.
151. George Daniel Hook and Alexander Purser.—A new or improved apparatus for lighting fuse and the like.
152. John Thomas Kennaugh Maddrell.—Improvements in apparatus for greasing ropes and rods.
153. David Hamilton Coles and Frederick Charaway.—Improvements in internal combustion engines.
154. Frederich Nellen.—Improvements in or relating to mining props.
155. Daniel Bosqui.—Process and apparatus for precipitating materials from solutions.
156. Robert Wishart.—Improvements in apparatus for grading and levelling land.
157. Henry Smith.—Heerigs Phonecap.
158. Edward George Clifford-Jones.—Fluid for spraying mine workings.

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Notes and News.

A New Tin Company. Particulars are given elsewhere in this issue of the latest tin flotation, styled the "Nigerian and Waterberg Tin Fields Trust, Ltd.," which has been registered in London with a capital of £75,000. In reference to the Transvaal assets of the company, it is interesting to note that the ground, or a portion of the ground in question was submitted to London by Mr. P. Boyle. The claims are in the Pietpotgietersrust area, and are situated, approximately, five miles from Mr. Boyle's camp on the discovery block on the farm Delagoa.

* * * *

Diamantfontein Development. The Diamantfontein Development Company was formed in November, 1911, with a capital of £20,000 in 10s. shares, of which some 28,000 are issued, to acquire prospecting rights for five years over three farms—Graspan, Pienaarsfontein, and Diamantfontein—with an option to purchase them outright for the sum of £30,000. Investigations are said to have demonstrated the existence of large areas of diamondiferous gravel on these farms, and small test washings have resulted in the production of some $10\frac{3}{4}$ carats of stones. The directors have therefore come to the decision to offer 10,000 of the unissued shares to the shareholders of the Diamantfontein Development and the Oceana Development companies for subscription at par. The amount thus provided will be sufficient to purchase ten additional washing machines and to carry on operations on a considerable scale.

* * * *

Guaranteed Dividends. A somewhat unusual kind of prospectus has been put into circulation by some person or persons under the ægis of the London and Rhodesian Investment Company, Limited, which calls for subscriptions to an issue of 24,000 shares of 2s. 6d. each at a premium of 1s. 3d. The nominal capital of the company, which goes by the name of the Pretoria Premier Gold Mines, Ltd., is £15,000 in 2s. 6d. shares, and as an inducement to prospective subscribers a dividend of 25 per cent. per annum for two years is guaranteed by the person or persons unknown, already referred to, the dividends to be paid monthly, and to begin after the expiry of one month from the beginning of crushing operations. It is proposed to erect a five-stamp battery to crush ore from the Kromdraai reef horizon on the farm Koppieslaagte, south-west of the Pretoria Cantonments. An extremely favourable report is published by Mr. Tromp van Diggelen, confirmed by the manager of the company, Mr. Harry Green. We are unable to criticise the details of the report without a careful investigation of the prospectus, but the profits are said to be assessed at over £1,000 per month, and for a five-stamp battery this is rather out of the common in these parts.

* * * *

Stock Exchange Values. A reflection of the effect on the Stock Exchange of recent events in the labour and political worlds is seen in the usual analysis of movements given in the *Bankers' Magazine.* A result of the prevailing uncertainty has been a shrinkage of nearly £4,000,000 in the value of the 387 representative securities at the 20th ult., as compared with the value of the previous month. It is pointed out that, although Stock Markets as a whole have displayed wonderful optimism in face of the industrial crisis, home securities are for the most part lower on the month, the fall being about equally due to the coal strike and monetary stringency. Foreign Government securities have been affected by unfavourable rumours of European politics, but sensational rises in P. and O. Deferred, in the Shipping group, and in certain Mining shares are shown. As a result, while there is a net decrease of £3,822,000, or 0·1 per cent. on the total, the Shipping group shows an advance of 6·2 per cent., South African Mines of 5·8 per cent., and Copper Mines of 6·2 per cent.

Namaqua Copper.

The directors' report on Namaqua Copper, just issued, shows that the net profit for last year was £53,300, as compared with £28,400 for 1909, and the balance dividend now recommended brings the return to the shareholders for 1911 up to a total of 25 per cent., which is exactly double the rate paid for 1910. In the two preceding years, 1908 and 1909, there were no distributions at all, and the latest result is the best since 1906, when 35 per cent. was distributed. The report under review shows that the grade of ore treated last year was somewhat lower, but a larger quantity was dealt with, and the rise in the metal which occurred at the end of the period favourably affected a considerable portion of the company's output. Besides doubling the dividend, the directors are again setting aside some £7,000 in connection with the new power plant, an installation which is expected to lead to considerable economy. The latest estimate of ore reserves shows a small increase in the quantity as compared with that announced a year ago, but the copper contents are somewhat lower.

* * * *

General Mining and Finance.

The issued capitals of ten subsidiaries of the General Mining and Finance Corporation showed a decline in market valuation from £10,746,000 at end of 1910 to £7,430,000 at the end of 1911, a depreciation of £3,316,000, or 30·8 per cent., as an average for the group of ten companies. Simultaneously the market valuation of General Mining shares fell from £3,748,000 to £2,108,000, or a shrinkage of £1,640,000, equal to 43·7 per cent. In other words, the market value of the parent fell very much more heavily than did the market value of the subsidiary enterprises referred to, the fall being—for parent 43·7 per cent., subsidiaries 30·8 per cent. In addition to "passing" the dividend, no less than £296,292—more than sufficient to equal a 15 per cent. dividend on the shares—has been applied from the profits of the year and unappropriated profits in writings-off.

* * * *

De Beers Dividend.

The bonus declared with De Beers Consolidated Mines' usual half-yearly dividend of 10s. per share is only 2s. 6d., as against the 5s. hoped for in London. An unexpected announcement, however, is the directors' decision to revert to the old practice of declaring the half-yearly dividends in December and June, instead of in September and March. But next September, as an exception, a quarterly distribution is promised to bridge over the transition. Some people profess to read into the change of policy a connection with renewed negotiations reported to be in progress for a working agreement with the Premier (Transvaal) Diamond Mines.

* * * *

British Central Africa Company.

During 1910-11 the revenue of the Shire Highlands Railway, of Nyasaland, which is one of the British Central Africa Company's chief assets, rose from £20,500 to £25,300. The profit of the parent company for the year was £29,800, which, added to £23,300 brought forward, gives a total credit balance of £53,100. Negotiations have been completed with the Colonial Office, whereby a sum of £180,000 is to be paid to the company for its subsidy lands, while the Government has agreed to guarantee interest at the rate of 4 per cent. per annum for a period of ten years upon a sum of £500,000 required for the construction of the railway from the Zambesi northwards to Port Herald, in Nyasaland. The general outlook for the company is such as to justify the belief that its fortunes will continue to improve.

* * * *

Consolidated Mines Selection.

The report of the Consolidated Mines Selection Company, Ltd., for the period from 2nd August, 1911—the date of registration of the Order of the Court confirming the reduction of the company's capital—to 31st December, 1911, to be submitted to the meeting on 7th May, states that the depression which overshadowed the South African mining market for so long was still apparent at the close of the financial year, and was unfavourable to business for the period under review. The capital of the company, which was formerly £1,200,000 in 1,200,000 shares of £1 each, was reduced to £600,000 in 1,200,000 shares of 10s. each, in accordance with the special resolution passed 21st June, 1911, sanctioned by Order of the Court, and registered on 2nd August, 1911. The issued capital is now £552,500 in 1,105,000 shares of 10s. each, leaving 95,000 shares unissued. In furtherance of the policy indicated by the Chairman at the extraordinary general meeting held on 6th June, 1911, the Debenture issue has been reduced to £138,400 by the purchase of £108,900 Debentures at a discount. On the reduction of the capital, which became effective on 2nd August, 1911, the re-valuation of the assets resulted in taking them into the books at that date at the sum of £844,464. The liabilities were as follows:—Five per cent. Debentures, £178,400; sundry creditors, including loans, unclaimed dividends, Debenture interest and contingent liability on various shareholdings, £113,564; together, £291,964, the difference of £552,500 representing the issued capital of the company as reduced. The financial position is satisfactory, cash and cash assets at 31st December, 1911, exceeding the current liabilities by £115,829. Unquoted securities, properties and investments stand in the books at the valuation made when the capital was reduced, and quoted shares are taken at cost or under, but in no case higher than the ruling quotation at 31st December, 1911. The book value of quoted securities is represented by the sum of £493,819, while unquoted securities stand at £87,542; together, £581,361. The net profit during the period from 2nd August to 31st December, 1911, amounts to £11,596, against which have been written off:—Cost of investigations and options, £874; written off sundry shares, etc., £7,076; Debenture interest, £3,642; income-tax, £791; expenses, etc., £6,228; credit balance carried forward, £11,596.

* * * *

Held Over.

Owing to pressure on space, we have been compelled to hold over further references to the proceedings at the monthly meeting of the Chamber of Mines on Thursday. The annual report of the Transvaal Landowners' Association, and the proceedings at the annual meeting, will also be dealt with in our next issue, likewise the important review of commercial matters by Mr. R. Hamilton at the annual meeting of the Johannesburg Chamber of Commerce.

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The Viking and Recent Developments.

An eight-drill Robey compressor and suction gas engine have just recently been delivered on the Viking Gold Mine, in the Mazoe district of Mashonaland. This compressor could, as a matter of fact, if necessary, run ten drills, but in any case the plant will enable the management of the mine to push ahead with development. There are stated to be between 20,000 and 30,000 tons of ore in reserve in the mine to-day, of which about 83 per cent. assays 9½ dwts. per ton. With the contractors and boys at present working on the property and the new compressor plant, it is reckoned that development will proceed at the rate of between 10,000 and 12,000 tons per month. The Viking Gold Mines, Ltd., consists of some eighteen blocks of claims (quartz in granite) and the farm St. Gerera, situated about eighteen miles north of Salisbury.

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Mr. Ackermann and Private Companies.

The association of Mr. A. H. Ackermann with certain Rhodesian companies in the capacity of consulting engineer has often occurred to us as a rather remarkable thing and one which is not easily reconciled with Mr. Ackermann's official position as chief mining engineer in Rhodesia of the British South Africa Company. We have, however, refrained from commenting on this in the past, as it struck us as being largely a personal matter and one which the British South Africa Company and the mines in question had probably arranged privately between themselves. But since attention has been directed to the fact in London, we may be pardoned if we now make reference to it. Certainly Mr. Ackermann's dual capacity appears anomalous, and we are unable to find a precedent for a State Mining Engineer engaging in private practice and acting not only as a consultant but as a superintendent in addition. It is true that in the Transvaal Mr. R. N. Kotzé reported on the Modderfontein Areas, but the proposition, although now under the control of the Johannesburg Consolidated Investment Company, was primarily a Government concern and one therefore which came directly into the province of the State Mining Department. It is common knowledge that the British South Africa Company, under the terms of the Mining Regulations, acquire substantial interests in every Rhodesian Company floated, but this does not justify Mr. Ackermann's double positon as consulting engineer to private mining companies as well as mining engineer for the State. One would imagine that the State's interests could best be served by dissociation on the part of the Government Mining Engineer from private concerns rather than association with them. A Government mining engineer's office should, one would think, be free of the turmoil of new flotations and superintendence. There may, of course, be facts in connection with the continual appearance of Mr. Ackermann's name on prospectuses and reports which are unknown to us and the public at large. At any rate, some explanation appears necessary to reconcile Mr. Ackermann's association with the British South Africa Company on the one hand, and the private companies on the other.

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The Anti-Malarial Association.

We have received from the South African Anti-Malarial Association a useful hang-up card on the danger of mosquitoes, illustrated by sketches of the Culex, Anopheline and Tiger Mosquitoes (for which acknowledgments are tendered to the Liverpool School of Tropical Medicine) and diagrams of a mosquito-breeding pool, dwelling-house showing verandah, wire gauze for screening windows and mosquito breeding haunts, etc. The card also gives instructions as to the destruction of mosquitoes, protection against the bites of mosquitoes, and the prevention of malaria. The following excellent axioms regarding prevention are laid down on the card: "Screen the house or bed, or both, with proper mosquito netting, so that mosquitoes cannot enter and bite you. It is only by the bites of mosquitoes that malaria is spread from one person to another, and the chief danger of infection is at night. Destroy all mosquitoes and mosquito larvae wherever found. Take regular doses of quinine during the fever season. Five grains of quinine taken regularly every day acts as a preventive of malaria. Have your native huts, if possible, at least 500 yards away from your own house. The majority of natives, especially the children, are infected with the malaria parasite, and mosquitoes after biting them may convey the disease to you. Where pools or collections of standing water cannot be filled in or drained, spraying of the surface water with paraffin is advised." Regarding the use of quinine, a word of warning may be ventured as to the daily use of this drug. Quinine, of course, is a most excellent preventive medicine, but not everybody can take it regularly every day with impunity. Experience rather recommends the taking of, say, 5 grains of quinine each evening for two consecutive days, and then the discontinuing of it for two days, resuming the dose on the third day. Thus one takes quinine for two days and then gives it up for two days. Such a course is advised by many authorities on tropical disease and tropical medicine, and experience has proved this method the most beneficial. Perhaps the value of the card would be increased were a few words of advice on the treatment of malarial and blackwater fever added. Often in an outlying camp many hours or even days must elapse before the services of a doctor can be obtained and the pursuance of a correct or incorrect method of treatment and nursing often means all the difference between life and death. The Association, however, is to be congratulated on the scientific thoroughness that marks the latest evidence of its activity.

TOPICS OF THE WEEK.

PROGRESS OF THE PHTHISIS BILL.

It is not clear, up to the moment of going to press, whether the Government will or will not appoint a Select Committee to deal with the Miners' Phthisis Bill. Already the debate on the Bill is approaching record length, and much more remains to be said. The mining industry, through its spokesmen in the Union Assembly and through the President of the Chamber of Mines, has received the Bill in an admirable spirit, sympathetically anxious to remove its defects and to make it into a workable measure. Sir Lionel Phillips and Mr. F. D. P. Chaplin have given their views very freely and moderately during the week, and it is to be hoped that the Government will accept their suggestions in the spirit in which they are offered. Mr. J. G. Hamilton, at the Chamber of Mines meeting on Thursday, crystallised the official opinion of the industry in a few pithy sentences. Having recounted the efforts made by the Chamber to cope with and cure the evil, he mentioned that in regard to the present Bill itself, the Chamber has made respectful representations to the Minister that a grave defect of the Bill is that no provision is made for decreasing contributions on those mines where phthisical conditions show improvement as the result of preventive measures. Obviously such a principle would afford the best incentive for the eradication of the disease, which, after all, is the ulterior object at which we are all aiming. The Chamber also made various other suggestions on the merits of different points in the Bill, more especially with regard to a tripartite contribution, involving the State, the mines and the men. Mr. Hamilton concluded with emphasis:—"Not one of us wishes to minimise the gravity of the subject under discussion, and the necessity for relief, and for ultimate prevention, if possible. Not one of us wishes to criticise in any captious spirit what is proposed to be done for the alleviation of the evil, but at the same time it is our duty to endeavour to obtain the most workable and the fairest solution to all parties concerned. I do not desire to make any attempt to apportion the blame for the regrettable position which has so insidiously arisen, but I would venture to say that the Government cannot claim to be the least blameable of the three parties concerned in this matter. There is no useful purpose to be served by mutual recrimination. It is for everyone concerned to assist, as far as his opportunities go, in framing an equitable measure for the relief of the evil which has gradually arisen, and to take every step in his power towards its lessening, and its eradication if possible." The one point that emerges from the lengthy detailed criticisms to which the Bill was subjected by Sir Lionel Phillips and Mr. Chaplin is the need for a Select Committee to examine it. In the light of the many shortcomings that have been pointed out, such a purifying process seems essential to the Bill. If the Government desires a permanent settlement of the question, as distinct from a stop-gap measure, it will have to listen seriously to the advice tendered by the mining men in the Assembly. Parliament will, no doubt, prefer to decide for itself on the principle of a State contribution; it cannot possibly hope to do justice to many minor issues raised in the draft Bill. The telegraphed summaries scarcely do justice to the exhaustive speeches of the members of the Opposition, but they tell enough to make it clear that without their friendly, dispassionate, and wholly constructive criticism, the Bill would be a jumble of confused, well-intentioned provisions, bound, in practice, to prove unworkable. That Parliament will, on reflection, come to recognise this, and relegate the Bill to a Select Committee, we still hope and trust.

THE POSITION AND PROSPECTS OF THE RAND.

A NOTE of cheerfulness, as welcome as it was unexpected, pervaded the speeches made at the annual dinner of the South African Institution of Engineers last Saturday. When financiers like Sir George Albu and Mr. J. G. Hamilton, and engineers like Messrs. W. L. Honnold, E. J. Way, and F. H. Davis can unite in taking a hopeful view of the position and outlook, things cannot be so bad as those who trust only the evidence of the share market would have us believe. Mr. Honnold's speech, which we print elsewhere, will be found to resolve itself into a close analysis of the last annual returns of the industry, and a convincing summary of the conclusions to be drawn therefrom. He showed that the small decline in grade is more apparent than real certain influences having been at work which can only be looked upon as abnormal, and which have no bearing on the general grade of the ore. Working costs for 1911 averaged 18s. per ton milled as compared with 17s. 7d. for the preceding year. This increase is in a large measure due to greater expenses in connection with recruiting and wages of native labour owing to excessive competition for unskilled labour, as well as to a policy, in some instances, of including in working costs items which might have been treated as a capital charge. The annual report of the Consolidated Mines Selection Company, issued this week, naturally takes a view of the returns similar to that of Mr. Honnold and Mr. Hamilton. That report states:—"This anomalous position is principally due to the depressed state of the money markets during the year, making it necessary to apportion large amounts out of profits for capital requirements in respect of equipment and excess development. As an illustration, it may be mentioned that 19 mining companies earned an aggregate profit of £1,797,836 during 1911 without making any distributions to shareholders. Furthermore, a number of other companies made reduced contributions, while maintaining fully their former working profit. Reviewing the position broadly, it may be said that on analysis it is more satisfactory than at first appears. While it is true that there have been unpleasant developments in certain quarters, a number of important companies have been greatly improving their intrinsic position, and the results of these improvements should be noticeable in the coming year."

Sir George Albu's speech reviewed the many difficulties and hindrances that beset the industry, but concluded in a more cheerful key. He showed how little encouragement was offered to capital by the present dividend return; described the inefficiency of white labour and the insufficiency of black, as the weak link in the Rand chain of production, and deplored the disproportionate cost and top-heavy character of the Civil Service of the Union. Despite all this, he declared that the future of the industry was assured, that it would continue to make headway and prove the mainstay of the country. Though Sir George still ranks himself among the optimists, it is plain that he is under no misconception regarding the troubles, present and prospective, of the industry. Like Sir George Albu, Mr. Hamilton regards the outlook with restrained optimism, and takes a grave view of the phthisis question and the responsibilities of the mines in regard to it. Mr. F. H. Davis, the President of the Institution, offered some valuable constructive criticism on the utilisation of the Rand labour supply, and Mr. E. J. Way pointed out some of the anomalies of the draft Phthisis Bill. Naturally, there were references to recent "untoward incidents" in the industry; Sir George Albu and Mr. Way euphemistically termed them "mistakes," and there seems to be general agreement that no good can be done by dwelling on them, or allowing ourselves to remain overlong unduly depressed by them. This is an admirable spirit, and provided, of course, it is not carried to extremes, is infinitely better than crying over spilt milk. Last Saturday night's function, though primarily of a purely social nature, will have filled a useful public purpose if it causes the industry to face its present troubles with courage and confidence.

THE BEWAARPLAATSEN CONFISCATION.

IF Mr. Hull thought that he had said the last word on the Bewaarplaatsen question when he declared he would not move from his position on the matter unless directed by Parliament, he reckoned without the seriousness of the issue at stake. No opportunity has yet been given the Opposition to bring up the matter again, but the Capetown Press is teeming with protests against the Treasurer's high-handed methods from anxious and dismayed representatives of the vested interests affected. Incidentally, it is noteworthy that the loudest of these outbursts emanate from well-known supporters of the Government, such as Mr. H. de V. Steytler and Mr. Richard Goldmann, the unsuccessful Government candidate for Georgetown. Mr. Steytler, who is, of course, the well-known Johannesburg attorney, concludes a lengthy and exhaustive letter on the question as follows:—"In face of these incontrovertible facts, how can there be any doubt as to the owner's position? Legally, he is entitled to all the proceeds, less the cost of control, management, and disposal, and this, rightly or wrongly, has been fixed at 50 per cent. of the proceeds, and yet we find that the Minister of Finance, who in 1904 reaffirmed the principle that the owner was entitled to half the proceeds, coolly telling us to-day that the owner has no claim. But, be that as it may, the momentous question to the landowner, not only in the Transvaal but in the whole of the Union, is how and when will Parliament deal with this question of owner's rights—rights vested by the laws of the country? Will it disregard the findings of the various Commissions and the report of the Select Committee on the Draft Law of 1903? Will it disregard the opinion of so eminent a jurist as Sir Richard Solomon? Will it disregard the Gold Laws of 1896 and 1898, which vested in the owner of land in the Transvaal one-half of the proceeds of the sale of undermining rights? If the attitude taken up by the Minister of Finance foreshadows that Parliament will be asked by the Government to allocate these proceeds *in toto* to the Treasury and ignore the owner, then it behoves every respecter of title, every owner of property, to be up and doing to prevent what in truth would be an act of confiscation. If Parliament ignores the owner's just claim, then the inevitable result will be that the terms 'security of title' and 'vested rights' will become meaningless; capital will be withdrawn from this country, and irreparable loss will be sustained by many who, on the strength of the 'beshuit' of the 25th August, 1896, invested enormous sums of money in the purchase of land carrying the undermining rights." This is strong enough. Mr. Richard Goldmann is no less forceful and convincing. He concludes a detailed examination of the history of the matter in the following emphatic terms:—"The confidence of investors will be rudely shaken, if vested rights are light-heartedly destroyed. Of that there can be no question. Let me quote what the right hon. the Prime Minister said on the 15th March last year, when he opposed those who desired light-heartedly to do away with the right of mines, established for many years, to work their batteries on Sundays: 'They must first of all have stability in South Africa. Secondly, they must act honestly, so that the world could fully trust them, and repose confidence in them; and, thirdly, they must have new capital with which to develop the country.' And, again, let me quote the words of Mr. Malan: 'As this country was still young, and wanted more capital for development, it was the duty of the Government to see that confidence was restored.' Can it be said that the destruction of vested rights is likely to inspire confidence? Fortunately, the question I have dealt with is not a party question, and I am satisfied that the Government and the Union Parliament will not deal light-heartedly with it when it comes within their review." No words of ours can increase the force and emphasis of these appeals. It is only necessary to turn up the report of the speech made by Sir Lionel Phillips in the House a few days ago on the question to illustrate how untenable and illogical is the position taken up by Mr. Hull. If the credit of the Union is not to suffer, Parliament must deal promptly and finally with the anomaly.

THE TIN FIELDS.

An Exciting Pegging Incident at Rhenosterhoekspruit—Progress of the Century Tins, Ltd.—A Bellevue Flotation—Interesting Case in the Courts.

The proclamation of the farms Rhenosterhoekspruit and Uitkyk, upon the common boundary of which are situated the claims of the Century Tins, Ltd., was duly carried out on the 9th inst., as announced in this journal. In spite of the fact that the farms are somewhat remote from the railway, and that the directors of the Century Tins, Ltd., have preserved a considerable amount of secrecy with regard to their doings and findings on their property, a fairly large number of peggers had collected upon the scene before the morning of the proclamation, and some of them had taken some trouble to inspect as much of the area as possible, and investigate its ore-bearing character by means of the hammer and the prospecting pan. Some fifteen or more distinct parties are reported to have stood to attention when the pistol was fired, or, to be more correct, when the two separate pistol shots were fired. This part of the performance, by the way, is not quite clear, for we are unable to see why two separate signals should have been given, at an interval of about ten minutes. It is explained by some who were present that the intention was to make the signal heard over the whole extent of the ground upon which peggers were likely to be waiting, and that it was considered doubtful whether a shot fired in one place could be heard from the neighbourhood in which the second shot was fired. What was to happen in the event of both shots being audible everywhere was apparently not fully provided for. The greater number of the pegging parties proceeded along the north-western extension of the Century Tins line of reefs, to a neighbourhood where some of the earlier prospecting workings of the company were made and afterwards abandoned. Two other parties made their way as early as possible to an elevated area on the south-eastern extension of the same line, that is to say on the opposite side of the company's ground. The three directors of the concern, from Pretoria, together with their attendant body of peggers, appeared upon the same place rather later. Seeing that this was the locality favoured by the company, who may be supposed to have taken their bearings very carefully beforehand, the other parties prepared to do their level best, in the words of the pioneers. The first shot fired to the north-west was heard distinctly enough, it is said, on the south-eastern side of the ground, and the two pegging parties just referred to started in to work immediately. Whether the company's party followed suit at once we are unable to say, but by the time the second shot was fired a great number of claims had already been pegged. We understand that a protest was made by the company's people later on, on the grounds that the others had made a false start, but it is also alleged that the company's people were the only ones who were aware that the two shots would be let off. If so, the situation is rather a difficult one, to say the least of it, and one which can only be got out of satisfactorily by an attitude of give and take on the part of all concerned. Other points of disagreement of the usual kind were noted as between various bodies of peggers, but will doubtless be susceptible to adjustment if a reasonable mood prevails.

We have little information with regard to the results obtained by the Century Tins, Ltd., except that they appear to be satisfactory, and that three distinct lines of fissure carrying ore are being opened up. The report of Dr. Merensky upon the property, which was published in our issue of February 18, 1911, gives a good description of the main geological features, and is, we believe, still fairly accurate in this respect. There are said to be some £30,000 worth of tin ore lying at grass upon the property, and a shipment of five tons of ore has been sent to Germany for the purpose of an investigation into the question of treatment. The mine is being opened by adits, levels and winzes, and the main fissure is said to have been proved over a length of 2,000 feet along the outcrop, and for some distance, at any rate, to a depth of 600 feet, at which level the lowermost adit is driven.

The three lines of fissure are said to be converging towards the south-east, and to come together along the line pegged by the company and the other two parties, although it is expected that other lines of reef are existent in parallel directions. Tin bearing fissure rock has actually been located along the extension referred to, but nothing appears to be known as to the conditions below the surface. An inspection of some samples from the neighbourhood shows the usual fine tin which is characteristic of felsite country, and it will be remembered that the occurences in the vicinity in question are in fissures along the granite felsite contact. Ore from the lowest levels of the Century Mine shows an abundance of pyrite in seams, and for this reason the satisfactory treatment of the ore for sale will demand careful study.

Bellevue, Potgietersrust.

We are informed that a company, under the title of Bellevue Tins, Ltd., has recently been floated for the purpose of prospecting and working 500 claims on the farm Bellevue, north of Delagoa, Potgietersrust tin-field, and a prospecting area on the adjoining farm Klipplaatdrift. A considerable amount of work is said to have been done already on the claims, upon which a tin-bearing lode running north-east and south-west has been opened by means of shafts and trenches over a distance of approximately 1,500 feet. It is expected that it will be found to traverse the whole property. In a shaft sunk to a depth of 50 feet the body is reported to be 5 feet 3 inches wide, with a dip of nearly 75 degrees. The lode matter is described as being pegmatitic in granite country. On about 175 claims alluvial tin-bearing gravel has been found, and since the Sterk River flows through the ground in question, it is considered that the alluvial is a valuable asset. The directors propose to prove the lode above-mentioned by means of further sinking. Another lode is reported to exist north of the former, but so far little work has been done upon it. The claims have been purchased outright for shares in the company, the vendor, we are informed, having preferred this arrangement. It is intended to float a subsidiary company at an early date to deal with the alluvial ground.

Litigation in the Supreme Court.

A case is being heard in the Supreme Court, before the Judge-President, and Justices Sir John Wessels and Sir William Smith, which is of some interest, not only on account of the parties concerned, but also on account of the points involved. Briefly, the Olifants B. Tin Syndicate have brought an action against H. de Jager, in which they claim that a certain discovery made by the defendant on the farms Mutua Fides and Tigerpad, in the Waterberg district, which were the property of and had been thrown open by the Transvaal Consolidated Lands Company, was made on behalf of the syndicate. In the alternative the syndicate claimed that the discovery was made by the defendant in the course of his duty as agent for the plaintiff syndicate, and that the latter was therefore entitled to the rights and benefits connected therewith.

Solomon's Temple.

At the extraordinary general meeting of shareholders, held last week, for the purpose of adopting certain resolutions relative to the altering of the articles of association, the chief of which was to enable the board to increase the nominal capital of the company by 40,000 shares, instead of 30,000 as already empowered, the Chairman, Mr. A. Mackie Niven, gave the following information with regard to the progress of the work in hand:—

> Operations are being carried on by the company's manager, under direction of Dr. Hans Merensky. No work is being done on the felsite formation, but all the available labour is being concentrated on the mineralised zone on which such promising discoveries were made in the past, and I am glad to say that in these sections we

are meeting with considerable encouragement. In the north fissured section, near Nel's shaft, a quantity of what is known as float tin stone, worth 15 per cent. oxide, indicates the presence of a valuable pipe, but this has not yet been located. In the same section we are sinking a shaft on an impregnated fissure which has given payable values over a stoping width. At the moment these values are not quite so good as they have been. In the south fissured section the principal work being done is in what is known as the white shaft, where quite fair values have been obtained from time to time and which, if proved payable, will give us a considerable quantity of ore. In the north-west section four small pipes have been discovered close together, two of which, 15in. in diameter, assay 10 per cent. oxide. Work is proceeding on these in the expectation that they may make into one body. In the same section, on what is known as the quartz and tourmaline fissure, values are increasing as depth is attained. The shaft is down 20 feet, and pockets of tin ore have been found yielding over 20 per cent. oxide. The manager considers that this shaft gives every encouragement of favourable finds. Speaking generally, the work now being done is exposing quite encouraging values in several directions.

At the end of March the company had nearly £5.000 cash in hand, the company's monthly expenditure being between £400 and £500. There was available in addition £14.711 debenture stock unissued, of the £40.000 stock recently created, some of which is still under option.

At the annual meeting on the 23rd May next further details will doubtless be added.

PROGRESS OF THE GOLD FIELDS GROUP.

Increase in Aggregate Profit—Flottmann Drills at the Knights Deep—Continued Advance in Simmer East's Profit—A Decline at the Luipaardsvlei.

The total profit earned by the mines of the Consolidated Gold Fields of South Africa group last month was £120,190 from 329,408 tons milled, 1,260 stamps and 40 tube mills being at work. In comparison with the previous month, an increase of £8,493 in profit is to be observed, 38,348 more tons being crushed. There were 50 more stamps at work. The March profit is, in fact, the largest declaration made for months past, the February earning being £111,697, that for January £101,429, and for December £106,552. The particular policy of the Consolidated Gold Fields Company is to keep returns at the average grade and capacity of the mines in so far as is humanly possible, and the improvement in the profit is directly attributable to the longer month, a small increase in stamping capacity and a consequent enlargement of tonnage milled.

The Simmer and Jack had a satisfactory month. Profit for March at £47,139 compares very favourably with £39,647 earned in February, and in addition the gold reserve has increased from 1,255 ozs. to 1,855 ozs. Although the full equipments (320 stamps and seven tube mills) were kept at work in each period, there were crushed at this mine 73,800 tons as compared with 64,400 tons during the shorter month of February.

The Simmer and Jack East records a further advance in profit, the March earning being £5,213, as compared with £2,928 in February, which in turn was a large advance on the £887 declared in respect of the January operations, and £838 in December. This improvement is remarkable, and would seem to point to a distinct change for the better in the affairs of this mine, which has been a very disappointing subsidiary. As a matter of fact, however, no real change in the condition of the mine for the past two years is to be observed. There has, it is true, been an improvement in grade, but for how long this advance can be maintained is problematical. The Simmer and Jack East is in liquidation. It is a much broken proposition, and efforts to maintain anything approaching a uniform grade are attended with considerable difficulty.

At the Knights Deep the tonnage last month was greater, but the profit stands at £17,663 as against £18,351 in February. This decline is largely accounted for by native labour shortage and difficulties which seriously affect a very low-grade proposition such as the Knights Deep. Every effort is being made to instal labour-saving appliances and thus make better use of the native labour supply available. Flottmann drills continue to achieve excellent work in the Knights Deep, and it is an indication of the high opinion formed by the mining and engineering staffs of the Gold Fields group that on all the mines of the Consolidated Gold Fields drills of this type are now employed. We understand that at the Knights Deep about 20 of these machines are in use. Hitherto they have been utilised almost wholly on the Bastard footwall, but they are now being put in stopes as well. Better results, it is believed, would be secured were a bar or similar form of mechanical support utilised for the "Baby" Flottmann, instead of the present method of holding the machine up by hand or resting it on the shoulders, as natives are now doing.

As to the other Germiston mines under Gold Fields control, it is to be remarked that the Simmer Deep earned £4,037 as compared with £4,754 in the preceding month Although five more stamps were at work, and despite the longer month, the tonnage milled is but little greater. The Jupiter, on the other hand, had 25 more stamps running, and the profit advanced from £5,410 to £6,791.

At the Robinson Deep, where the metallurgical scheme is being reorganised, 20 more stamps were working, and the profit improved from £36,786 to £37,351.

The Luipaardsvlei Estate records a large decline. One thousand tons more were milled, and the recovery is about the same—3,561 ozs.—but the profit stands at £1,180, as against £2,940. Presumably there has been a large advance in working costs. We understand that nothing has as yet been decided in regard to increasing the crushing capacity of this mine to over 20,000 tons per month. Should this be carried out, it will be effected by installing other tube mills and not by additional stamps.

It is interesting to note that the Gold Fields Company continues to declare reserve gold, and has not yet followed the example of the Central Mining group in abolishing reserves.

South Randfontein Deep.

The second ordinary meeting of shareholders of the South Randfontein Deep, Limited, was held on April 17, in the Board-room, Silesia Buildings. Mr. Neuhaus (chairman) presided, and there were also present Messrs. M. G. Elkan, V. J. Ronketti, A. G. Gill, E. Friedlander, M. Rode, W. R. Crowhurst, and W. M. Tudhope, Transvaal secretary, representing 170,668 shares out of an issue of 445,447.

The Chairman, in moving the adoption of the report and accounts, said : It will not be necessary to detain you at length, for, as you know, at the extraordinary general meeting held just a week ago, the provisional agreement relative to the sale of your claim property, machinery, plant, and certain other assets to the Randfontein Central Gold Mining Company, Ltd., at the price of 75,000 fully paid shares of £1 each in that company, was ratified and confirmed. The necessary steps for effecting the transfer of your claim property, etc., were at once taken in hand, and it is expected that this will be completed within a very few days. As you will remember, in the circular which was issued to you calling the extraordinary general meeting for the purpose of confirming the sale just referred to, it was stated that the cash then in hand, i.e., on the 29th of February, was approximately £4,000. Since that date, of course, expenses in connection with such sale have been incurred, and as these have been rather heavy this amount has been considerably reduced. The report and accounts were adopted. Messrs. Hans Neuhaus and Ernst Friedlander, retiring directors, were re-elected. Messrs. F. W. Diamond and English and Mr. Charles Stuart were appointed auditors, and voted fifty guineas each for the past audit.

CYANIDING AT THE PRINCESS ESTATE.

Excellent Residue Figures—Interesting Results from Caldecott Sands Filter—Ten Additional Stamps to be Erected.

Several months ago we gave a description of the new cyaniding plant at the central station of the Princess Estate and Gold Mining Company, Ltd., adjacent to the old Roodepoort Central Deep battery. The final change-over to the central mill, which was begun towards the end of last year, was fully effected in January, when the present crushing capacity of 50 stamps and five tube mills was established. Since that time sufficient work has been carried out to enable one to judge of the efficiency of the plant, and we are indebted to Mr. H. A. White, consulting metallurgist to Messrs. A. Goerz & Co., Ltd., for some unusually interesting figures relative to the operations and results of the sands and slimes units. The figures given refer to the month of March, the latest available, therefore, during which period 16,529 tons were cyanided, the product comprising 6,640 tons of sand and 9,889 tons of slime. In other words the ratio of sand to slime per cent. was 40·17 to 59·83, or say 40 to 60. The crushing is coarse, in fact coarser than at any other mill upon the Rand, 60 per cent. of the screening being of 1 in. mesh, and 40 per cent. of ½ in. mesh. This coarse product is raised by two 8 in. Morris pumps to a Schweder pulp distributor, which comprises five concentric compartments, fed by shoots leading from a radially divided receiver above. As the receiver revolves, each division is brought in turn under the mouth of the feed launder; this ensures uniformity in distribution. We are informed that the apparatus is doing excellent work, as indeed may be gathered from an inspection of it. From each concentric compartment a launder leads to one of five dewatering cones 5 ft. by 9 ft. From each tube the pulp passes over three stationary amalgamating plates, 4 ft. 3 ins. by 12 ft., and thence back again to the elevator to complete the circuit. The final pulp from each cone passes over a set of three secondary plates on an upper floor, and thence to a 7 ft. by 9 ft. safety cone before flowing away to the cyanide plant.

Caldecott Sand Filter Table.

The final pulp has shown a grading of 1·44 per cent. + 60 and 8·48 per cent. + 90 mesh, and these figures are, we believe, sufficiently unusual to deserve special comment. In the cone plant department there are three 8 ft. by 10 ft. collecting or primary cones, the underflow from which goes to two table cones, and thence to a 16 ft. Caldecott sands filter table. The overflow from these two sets of cones, where a thorough washing of the sands is effected, passes through two return sand cones on its way to the slimes collecting cones.

At the beginning of operations a considerable amount of testing was carried out upon the filter table, first with water delivering to the sand collecting vats, and then with a delivery by means of solution. The result of using solution was that a gain of 0·1 dwt. per ton treated was made in the recovery, equivalent to a difference of between 0·2 and 0·3 dwt. in the residues. This is a circumstance which has not, we think, been largely investigated or discussed in connection with the operation of the Caldecott table, and although some of the excellent results obtained at the Princess Estate may be fairly attributed to the kindly character of the ore, this particular fact is obviously due to the use of the filter with the accompanying transfer in solution. The gain in itself may appear small, but the metallurgist has to consider its cumulative effect over many thousands of tons of material treated. The sands plant consists of fourteen 30 ft. vats.

The slime which leaves the return sand cones is pumped to six 20 ft. by 14 ft. cones, the overflow from which is returned to the mill, while the underflow, carrying about 20 per cent. of slime, is pumped over a distance of about a mile to the slimes plant on the site of the old Princess reduction works.

Residues.

The residues obtained at the Princess plant, and taken all round, are, we believe, unexcelled by those shown by any other on the Rand. The March figures were, for instance:—

	dwt.
Sand	0·206
Slime	0·226
Average	0·218

Other figures of interest may be quoted. The stamps weigh 1,100 lbs., and have a duty of 12 tons, a fact which will be understood when the grade of screening used is considered. Four tube mills are run in conjunction with the 50 stamps, one being a stand-by, and later, when the 10 additional stamps, now being erected, are in their place, the ratio will be four to sixty, or one tube mill to fifteen stamps. About 74 per cent. of the total gold produced is obtained by amalgamation on the plates in the tube mill house, and of this quantity the overflow plates outside the tube mill circuit are responsible for 5 per cent. The total extraction by amalgamation and cyanide averages 96·5 per cent. The addition of the 10 new stamps, it may be remarked in conclusion, will raise the capacity of the mill from 18,000 to 20,000 tons per month.

Springs Mines.

The north shaft at the Springs Mines has been sunk a further 463 feet, and timbered 465 feet during the quarter, making the total depth 2,035 feet, of which 1,990 feet are timbered. The south shaft has been sunk an additional 336 feet and timbered 316 feet, making the total depth at the end of the quarter 1,637 feet, of which 1,593 feet are timbered. The Rand Water Board took 29,250,000 gallons of water from the company during the quarter.

Modder Deep Levels.

The following are particulars of work done on the property of the Modderfontein Deep Levels during the quarter ended March 31 last, viz.: Shafts Nos. 1 and 2 were sunk to the respective depths of 2,434 feet and 2,014 feet, the bottom of shaft No. 1 being in dyke and that of shaft No. 2 in quartzite. The permanent pump at the 1,400 ft. level has been erected and is working satisfactorily. There is no difficulty with water making at the bottom of the shafts.

Koffyfontein Diamonds.

The rough and uncut diamonds registered at Koffyfontein, O.F.S., in March weighed 4,930 carats, valued at £10,812 7s. 6d.

Lydenburg Farms.

The annual meeting of shareholders of the Lydenburg Gold Farms Company, Ltd., was held on April 12 in the board-room, Stock Exchange Buildings. Mr. R. Baumann presided, and there were 91,244 shares represented out of an issue of 250,000. The Chairman moved the adoption of the report and accounts, pointing out that the company's investments and funds were virtually unchanged and intact as compared with the past few years. The directors regretted that in the interests of the company they deemed it necessary, on the advice of the company's consulting engineer, to discontinue prospecting operations. The report and accounts were adopted. Messrs. E. Friedlander and R. Baumann were re-elected directors.

THE FERREIRA—FERREIRA DEEP UNION.

West Shaft of the Ferreira Being Continued—Underground Conditions in the Ferreira Deep Much Improved.

EARLY next month the special general meetings of the Ferreira and Ferreira Deep Companies, called for the purpose of considering the provisional amalgamation agreements, will be held. The salient financial features of the scheme have already been dealt with in this journal. Briefly stated, they are liquidation of the Ferreira Company; retention by the Ferreira of sufficient funds to make a cash distribution of ten shillings per share and to purchase 25.000 shares in the Ferreira Deep at a price not exceeding 76s.; purchase of the Ferreira by the Ferreira Deep for 70,000 new Ferreira Deep shares. The amalgamation proposals have met with favour both in South Africa and England, the most critical London mining and financial papers applauding the scheme and pointing out that it is a natural and proper course.

FERREIRA'S WEST SHAFT BEING DEEPENED.

Having in view the union of the two mines, the west shaft of the Ferreira outcrop is being carried down into the Ferreira Deep ground. It will be sunk to open up the upper levels in the Ferreira Deep section, and already a fair amount of work has been carried out with this object in view. The shaft is now being sunk to the Leader on the second level of the Ferreira Deep. In the provisional agreement various provisons are inserted providing for the upkeep and continued working of the old outcrop mine and for the Ferreira Gold Mining Company, Ltd., to act as a trustee for the Ferreira Deep up to the date of confirmation of the agreement.

FERREIRA DEVELOPMENT COMPLETED.

Development of the Ferreira has now been completed, some blocks of Main Reef in which it was hoped to find profitable values having been proved unpayable last year. The block ground in the mine is nearing exhaustion, but at the end of the year the payable ore reserves were estimated to amount to 324,603 tons of an average assay value of 8·13 dwts. per ton over a stoping width of 81 inches. Of this total between 140,000 and 150,000 tons are in "blocked ground," the remainder consisting of pillars. The ore reserves in the Ferreira Deep mine at the date of the last annual report amounted to 1,837,808 tons of 9·7 dwts. per ton value. Concerning the Ferreira Deep reference must be made to the fact that the condition of the hanging wall is now much better than was the case a few months ago. Various rumours have recently been afloat as to the position underground in the Ferreira Deep, but we learn officially that the mine is to-day in satisfactory circumstances. We do not here propose any forecasts as to the appreciation of ore values in either mine as a result of amalgamation. Obviously many substantial economies will be effected without impairing the efficiency of the plants or the profitable values of the ore in the mines.

NIGERIAN AND WATERBERG TIN.

Particulars of the New Undertaking—More Capital for the Transvaal Tin Fields.

THE latest development of the Nigerian tin boom is seen in the formation of a new company under the title of the Nigerian and Waterberg Tin Fields Trust, Ltd., of which the prospectus will shortly be issued. The company has been formed to finance and develop the tin mining industry, particularly in Nigeria and the Waterberg district of the Transvaal. The capital is £75,000, in 5s. shares, and of these 240,000 will be offered for public subscription, the remaining 60,000 being held in reserve for future issue, subject to an option. The company starts business without liability of any kind in respect of contracts or agreements other than an option agreement in respect of the purchase of certain claims in the mining district of Pietersburg, and the entire proceeds of the shares to be issued, less the expenses of the issue and the amount payable under the contract referred to, will be available for working capital. The chairman of the company is Sir Frederic Cardew, K.C.M.G., late Governor of Sierra Leone and chairman of the Central Lafon Tinfields of Nigeria; and the directors are Major A. A. M. Layard (late R.E.), director of the Americas and Orient Trust Company; Colonel F. G. Bradley, Mr. Graham Griffiths, chairman of G. W. Christian & Co., Nigerian merchants; and Mr. T. J. Scoones, M.Inst.C.E., civil and mining engineer. With reference to the payment out of the forthcoming issue, Mr. W. F. Trow, chartered accountant, the vendor to the company, has received from Mr. P. Boyle, mining prospector, of Sterkwater, in the Waterberg district of the Transvaal, the right of acquiring 320 base metal claims on the farms Delagoa, Bellevue and Appingendam, in the mining district of Pietersburg, in consideration of the sum of £3,500 and one-fifth of the share capital of any future company or companies to be formed to work these claims. This option is assigned by Mr. W. F. Trow to the present company for a payment of £1,000 and 10 per cent. of the capital of any such company to be formed. Mr. Trow also pays all preliminary expenses for the consideration of a sum of £3,500 in cash. It is pointed out that none of the directors are interested in the promotion or the option upon the property to be acquired by the company.

The objects for which the company has been formed are primarily (a) to acquire and exploit tin properties and concessions generally, and more particularly in Nigeria and the Waterberg districts; (b) to purchase, lease, or otherwise acquire any mines or mining rights, and to explore, develop or turn them to account; (c) to promote or form companies either in the United Kingdom or the colonies; (d) to carry on the general business of an investment and trust company, and acquire and hold shares, stocks and other securities; and (e) to acquire, at the company's option, 320 tin claims, or any part of that number, in the Waterberg District of Pietersburg, in the Transvaal. With regard to Nigeria, the company has offers of and is contemplating the purchase of other tin properties in that country. The Waterberg claims referred to are described in some detail in the draft prospectus, and are also referred to by Mr. John Croxford, director of the Coronation Collieries. Mr. Boyle, the original owner of the claims, is said to have had many years' experience of mining and prospecting in the Transvaal, in association with Mr. John Croxford. The latter, writing from Johannesburg in January, says: "For the last six months Pat Boyle has been working in the Waterberg tinfields, in the neighbourhood of Zaaiplaats, for joint account with myself, and during this period has selected, by testing and assaying (for values only), certain tin claims. Of these I am sending you, for disposal by flotation and otherwise, licenses for 920 claims on the farms Bellevue, Delagoa and Appingendam. . . What is wanted is the financial position to put life into these properties, and I may say the marginal outlook of profit is large provided that the expenditure is sufficient to open up the reefs to a payable working basis, and then sell or remain as a parent company. The reefs are there as partially developed in all the surrounding farms, showing tin giving 18 per cent. concentrates, the average working of which would, probably, be 5 to 7 per cent. when developed." Mr. Boyle in a later letter, refers to the group as in the centre of what will be the "biggest tinfield in the world." The claims are stated to be situated upon the red granite belt, in which is the Zaaiplaats Tin Mine.

CORNER HOUSE ABOLISHES GOLD RESERVES.

Very Significant Movement—Special Cash Reserves and Ore Reserves.

The very large increase in the output for March, as compared with that for February, of 126,857 ozs., is, as was stated in our last issue, due mainly to the inclusion of gold reserves. In future, the output as declared by the Chamber will be the actual output, regardless of transfers to or from reserves. In the monthly analysis sheet there will be two columns, showing (1) the actual ouput and (2) the declared output of each mine, any difference between the two being due to transfers to or from reserves. The decision of the Central Mining and Investment Corporation to declare current gold, and nothing but current gold each month has been the result of much studied reflection, and has been made in deference to the wishes of a large number of shareholders. An official intimation to this effect warns the investing public that they must be prepared for fluctuations in production, and therefore in the profit declared each month. It may well be that investors who have little or no knowledge of mining, and who still cling tenaciously to the old fallacy that the Rand is one solid sheet of pure gold from Randfontein to Springs, will experience dismay when the profits of the particular mine or mines in which they are interested record a decline or declines on the previous month's earning. They will also, presumably, be elated unduly when production and profit rises. To these, we believe, the actual declaration of gold won during any fixed period, and without reference to the earnings of any other period or periods, will come as a valuable education. It will assist them to realise that variations in stope face values, in running expenditure, and hence in profit, are inevitable. Indeed, such fluctuations can only be combated by deceptive weapons such as the operation of a gold reserve, or else by weapons which are most detrimental to the stability of mining enterprise, such as nibbling away at "show" stopes, unduly severe clean-ups, and manipulation of expenditure. Shareholders should become educated up to the view that the results of any mine or mines in comparison with preceding operations can only really be gauged by comparisons which contrast one lengthy period with another lengthy period. In other words, annual reports, and not monthly statements, should be accepted as the measures of comparison.

The History of the Movement.

The whole history of the gold reserve and its operation appears to have been built up on the false premises of absolute uniformity. In the very early days of the Rand such a claim received no recognition, but as the industry became established, and the deposition of gold in the auriferous conglomerates over a more vast area, and in a more concentrated manner, than in any other goldfield, became realised, a tendency to exaggerate this measure of consistency became evident. For years a secret reserve was manipulated, and, furthermore, on certain of the richest mines of the Central Rand recourse was had to extraordinarily high grade stopes when the normal return was deemed comparatively unsatisfactory. A few years ago it was announced that the secret reserve would be done away with, and in its stead a declared reserve would be operated. There has been much divergence of opinion as to the utility and value of this declared reserve. On the one hand, it has been contended that it enables the management to adjust output and profit, and, on the other, it has been argued with reason that the reserve loses its real function when it is disclosed. In an article appearing in this journal a few weeks ago, the total abolition of all reserves, secret or otherwise, and the absolute discontinuance of all artificial manipulation to the end of uniformity, were advocated. We then pointed out that in other mining fields, where the conditions under which the gold was deposited were less favourable to consistency than on the Rand, the actual productions and the actual profits only were announced. Furthermore, that the mining areas and mines in question had not apparently suffered appreciably in consequence of fluctuations.

"Central Mining" Transfers.

The formal announcement that the practice of maintaining a gold reserve at the East Rand Proprietary Mines would be abolished followed, and the last and most important manifestation of endorsement of the views set forth above is to be found in the March declarations of mines under Corner House control. The values transferred from reserve and declared by subsidiaries of this "group" last month were:—Modder B., £24,451; New Modder, £39,280; Village Deep, £24,755; Village Main Reef, £5,000; Ferreira, £10,364; Robinson, £44,290; Bantjes Consolidated, £2,979; Rose Deep, £25,700; Geldenhuis Deep, £1,717; Nourse Mines, £2,465; Crown Mines, £20,243; total, £201,244. In addition, the New Heriot transferred £1,279, and the City and Suburban £26,412. But whilst the Central Mining Corporation has abolished the reserve, the Consolidated Gold Fields, General Mining, and Neumann groups continue to operate it; at any rate, reserve gold figures in the last monthly declarations of the mines of these two groups. We strongly hold that the total discontinuance of applying accumulations to current outputs, or subtracting gold from current returns to swell the reserve, will be beneficial to the industry. The majority of Rand gold mining companies possess ore reserves large enough to ensure to shareholders a stability which few other mines in the world can lay claim to. But where such ore reserves are not, owing to any peculiar circumstances affecting the mine, deemed sufficiently large, the creation of a special reserve account in liquid cash, and not bullion, would best meet such exigencies of the case or cases as presented themselves. The East Rand Proprietary Mines have recently initiated such a special reserve fund and it must be admitted that at this property the establishment of such a fund was rendered advisable by reason of the past history of the mine, and the likelihood of a large pumping plant having to be installed. There is much to be said in favour of such a measure, but we fail to see that any really good purpose is to be served by the maintenance and operation of the gold reserve. It is significant that the leading mining house of South Africa has relegated this account to the limbo of tried and abandoned policies.

National Diamonds.

An extraordinary general meeting of shareholders of the National Diamond Prospecting and Developing Syndicate, Ltd., will be held on May 3, 1912, at 8 p.m., for the purpose of considering and if approved of to adopt the following scheme of reorganisation and the necessary resolutions to authorise the directors to carry the same into effect:—(1) To reduce the nominal capital of the syndicate from £20,000 to £7,500. (2) To then increase the capital from £7,500 to £30,000. (3) The said capital of £30,000 to be apportioned as follows, viz.: To the shareholders of the National Diamond Prospecting and Developing Syndicate, Ltd., £7,500; to the reorganisers (for reorganising and financing the syndicate), £10,500; for working capital, £3,500; to be held in reserve, £8,500. To reduce the denomination of the shares from £1 each to a denomination of 10s. per share.

Bechuanaland Diamonds.

Last week (says the Mafeking paper) Mr. Sam Streak found the most beautiful diamond that has probably ever been discovered in Bechuanaland. It is a perfect stone in every respect, and appears as though it had already been cut. It weighs about three carats, and is valued at over £30 per carat.

TWYFELHOEK No. 104, O.F.S., REDIVIVUS.

An Old Mine to be Reopened—Favourable Report on the Property—Former Finds by the Owner.

Some eighteen or twenty years ago the kimberlite pipe on the farm Twyfelhoek No. 104, near Koffyfontein, in the district of Fauresmith, was worked by the Julius Pam Company, and subsequently by a tributary syndicate, until these concerns were liquidated. It has now been taken up by the Koffyfontein East D.M. and Estate Syndicate, Ltd., and has been reported upon by Mr. J. Gouldie, formerly of De Beers, on behalf of a client in London. From his report we gather the following information:—

The farm is about 1,500 morgen in extent, and is situated about 12 miles N.E. of the mine and township of Koffyfontein, in the district of Fauresmith, O.F.S. The open workings of the mine are 60 feet deep, and are reached by an open incline cutting, located on the south side, exposing the shale wall of the mine to a depth of about 30 feet. At this depth the incline intersects with the kimberlite or "yellow ground," in which it is continued to the working level of the mine. The shale wall is exposed within the open workings for a distance of about 40 feet on either side of the open incline cutting, and the strike at this point is E. and W., showing the contact with the yellow ground very distinctly. It is worthy of note that this is the only point anywhere on the mine at which the wall-rock of the pipe is exposed. No "blue ground" kimberlite is anywhere exposed, but judging from the nature of the yellow ground, examined from the floor of the mine (that is, the lowest point), it is I would consider that blue ground will be struck at a depth of about 70 feet—or 10 feet below the present working level.

No. 1 Paddock.—About 75,000 loads of yellow ground have been removed from the mine at this point, and treated by the former owners about 18 years ago. The ground is in every way suited for direct treatment, if carefully and practically manipulated. It closely resembles the yellow ground of the Koffyfontein and the Bultfontein Mines.

Open Workings.—From the position of the mine, the diamondiferous ground is in every way favourable for careful testing. A daily output of 3,000 loads could be reached for a small cash expenditure with the minimum of trouble, as the development gradually advances. Sufficient work and disclosures have already been completed to prove the existence of over 200 claims, and the existing surface indications everywhere point to the existence of a further 200 claims at least. The area therefore available for treatment above the present working level of the mine, on this basis will yield 2,000,000 loads.

Summary.—"Summarising my remarks," Mr. Gouldie concludes, "and narrowing down my observations and opinions, I arrive at the following conclusions, viz. :—(1) The exposure of Kimberlite on the farm Twyfelhoek, is a true diamondiferous pipe. (2) The extent may be fairly estimated at anything from 400 to 600 claims. (3) Insufficient work has been done to enable anything more than a conservative estimate of the extent of the mine to be made. (4) The work so far done reflects no true estimate of the yield of the ground actually worked and treated. (5) The work so far done, having been limited to one portion of the mine only, is no criterion to the value of the other parts of the mine. I therefore recommend :—(a) That the tailings, cylinder lumps, and old sortings should be carefully tested under strict supervision. (b) That a quantity of ground from the paddocks as well as from the shafts already sunk in the yellow ground should be tested. (c) That the area of the mine should be defined by shafts: and (d) that ground should be taken from the other parts of the mine as defined by the work recommended above, and carefully tested. I recommend that shafts should be sunk into the blue ground, especially in No. 1 paddock. The old shafts should be deepened into the blue, and the ground taken from these depths should be properly tested. I am of opinion that with up-to-date machinery and under proper management, with diamonds at their present price, the mine must show results vastly more valuable than hitherto. With this in view, and with the knowledge of the high class diamonds obtained from Twyfelhoek, it is possible that the mine is now a payable proposition. In the finds of the former owner there was one stone of about 14 carats, which sold for over £600. I do not hesitate therefore to recommend the expenditure of a substantial sum of money to prove the property.

LATEST FROM THE PILGRIMS REST GOLDFIELDS.

[From our Correspondent.]

One of the properties referred to in the issue of April 6th, the Welcome Mine, situated in the Pilgrims Creek, has commenced crushing operations. Naturally there have been a series of short runs to date owing to various reasons, the chief difficulty being water, as the larger supply from below the mill is not yet connected. Matters, however, are very satisfactory, and an output above the ordinary run here for small ventures is predicted.

From an advertisement in the *Pilgrims and Sabie News* I gather that the Mac Mac Syndicate propose to derive some considerable benefit from the large areas of timber on their farm, as tenders are called for its cutting and transport to Pilgrims Rest. Considerable activity is being displayed on Graskop as a result of the recent rich strike of Mr. Miche, an extension of the Mali Dyke it is thought, many claims being pegged along the strike. Mr. J. P. Munro, of the R. Burnham Syndicate and C.B.M. Syndicate, has gone up to town to purchase machinery for the latter mine, which, it is hoped, will soon join the ranks of the producing mines of this district. The Diespecker Gold Mining Co. has suspended operations on Waterval. This is due to a lack of capital, and not to the values disclosed. This, like Glynn's Extension, in liquidation, is an example, too common, alas, of a property spoilt through its being tackled by a company who have to bear office and directors' expenses. Both these mines would prove valuable to a small syndicate of workers. The Pilgrims Creek G.M. Co. are still in the erection stage, but Mr. Bleloch, who was here this week, reports very favourably on the property. The Pilgrims Venture are pushing ahead development, but no results or values are known to me.

The Peach Tree Syndicate, Wilson block, which adjoins the T.G.M.E. Peach Tree Mine, and which is on the line of reef, have their shaft down 125 feet, and hope to strike the Theta Reef in another 10 or 15 feet. They are evidently in the zone, as the stringers are becoming highly mineralised. The Syndicate hope the reef will prove as wide and valuable as that on the T.G.M.E. ground, where it is the richest producer of the Central Mines. The ground lapsed some time ago, and when the Peach Tree Reef opened up so rich, Mr. Wilson managed to secure some claims adjoining, the company taking the majority of the others and forming a cordon. It was evident that the company thought well of this ground, for they pegged the deeper levels also.

The local *News* reports that the T.G.M.E. are endeavouring to get the railway into Pilgrims Rest now, offering a township site at Clewer. This would materially lessen their working costs, but would not benefit the district to any extent. The Graskop terminus, as proposed, will bring the line right into the centre of the mining area: to bring it down to Pilgrims would mean a tremendous outlay, and only benefit a few, for Clewer could never be a centre, as it is out of the way.

The returns this last month were affected by the storms and various stoppages for new installation, but were fair. The R. Burnham got £700 in the eight days they ran; the Ceylon Lydenburg £3,000; the Buchanan Syndicate £1,000; the Jollie Bright £800 for the month. These mines and the others of the district are on the whole improving their output, but the rainy season works havoc here. For example, the Ceylon Lydenburg slimes dam burst recently during a heavy rain, a torrent of water and sludge being precipitated into the Buchanan workings, a drive of which had lately inadvertently penetrated into the Jollie Bright, which mine was flooded in consequence.

THE CHEMISTRY OF BANKET ORE TREATMENT.

Relative Simplicity of the Chemical Problems—The Importance of Fine Crushing—Cyaniding versus Chlorination.

In the introduction to an interesting and useful chapter on "The Chemistry of Banket Ore Treatment," by Dr. W. A. Caldecott, in the "Text Book of Rand Metallurgical Practice," which was reviewed in these columns last week, the author explains those chemical and physical characteristics of the ore which are responsible for the line of treatment adopted. The following brief quotation broadly summarises these characteristics:—

The relative simplicity of the chemical problems presented in Rand metallurgy is a favourable condition which has rendered possible the low total cost of efficient treatment of the ore for under the value of 1 dwt. of gold per 2,000 lb. ton. Combined with cheap and enormous tonnages of available ore, it has caused metallurgical operations to become very largely mechanical, now that the main chemical principles involved have been worked out. Hence, whilst questions such as the best methods of handling daily several thousands of tons of material in a single plant are still the subject of diverse opinions among engineers, the use of reagents and employment of metallurgical methods, otherwise possible for improving the extraction of the gold, are precluded on the score of cost, since the gold content of the residue discharged is already so low. The scientific study of the chemistry of ore treatment on the Rand may be said to have started with the introduction of the cyanide process, as prior to that date even an assay office was not considered an essential part of a mining company's equipment, and there was practically no demand for metallurgical knowledge other than that of the empirical order. It may further be pointed out that the success of the chemical operations involved in banket ore treatment is mainly dependent upon the physical exposure of the gold particles by the preceding crushin since lixiviation by cyanide solution differs from, say, smelting in th the reagents used do not affect the silicious matrix, and it is as impossible to extract gold wholly encased in a sand particle as to remove the kernel of a nut from an unbroken shell. . . . . . . The main features of the treatment of banket ore are relatively simple from a chemical standpoint, as compared with the problems to be solved in other countries. Here difficulties are not encountered owing to the gold existing in a state of impalpable fineness uniformly diffused through the matrix, or combined with other elements such as tellurium. Arsenic and antimony sulphides do not exist to cause trouble in amalgamation and subsequently; cyanicides such as copper compounds are scarcely present in the pyritic ore as mined. Precipitants of gold from solution, such as carbonaceous matter, are practically absent from the ore, as are also oxygen-absorbing bodies, such as magnetic iron pyrite or pyrrhotite (Fe_7S_8). On other fields "free-milling" and "oxidised" ore are synonymous terms, in contradistinction to the "pyritic," "rebellious," or "refractory" ore encountered below the zone of oxidation. Pyritic banket, however, yields with present-day fine crushing a higher percentage recovery by amalgamation than was obtained in milling the weathered surface ores of the early days, and in general it may be said that ore from 3,000 vertical depth is as readily amenable to treatment, except perhaps that it is physically more compacted by the greater pressure, and requires finer crushing to expose the gold contents than the oxidised or even pyritic ore nearer the surface. Such differences as do exist in the readiness with which ore from different parts of the reef may be satisfactorily treated, probably depend upon the more or less finely divided state of the gold particles and the relative ease with which they are exposed by crushing, although, when milling what is known as the "bastard" reef, even finer crushing and more aeration than usual are required. "Rusty gold," with its coating of iron oxide, requiring blankets rather than amalgamated plates for its recovery, is hardly known nowadays when most mining is carried out at great depths.

Unweathered pyritic Rand banket ore virtually consists of silica with some silicates, about 3 per cent. pyrite (FeS_2), and a few dwts. of gold per ton alloyed with about one-tenth its weight of silver. Occasionally a little calcite or mangano-calcite and traces of nickel and cobalt are found. . . . . . . The mode of occurrence of the gold in the ore is a matter of prime importance, and, contrary to experience in other countries, it is not mainly contained in the pyrite crystals, nor distributed proportionately to this constituent, although the pyrite is richer in gold per unit of weight than the siliceous material. From Hatch and Corstorphine's microscopic investigations it was found that the gold particles are usually embedded in the siliceous cement binding the pebbles together, and in the vicinity of, but not contained in, the pyrite. The pebbles themselves are usually gold-free, although occasionally gold may be detected on their surfaces, or even in cracks from the exterior. Had the non-proportionate distribution of gold and pyrite in the ore, contrary to the proportionate distribution of copper in a chalco-pyrite ore, been realised, very large sums formerly expended in concentration equipment to remove the gold by concentrating the pyrite would have been saved. The non-proportionate distribution of gold and pyrite is still more marked in the cyanide residues.

At the time when concentration was practised on the Rand the concentrate was usually treated by roasting and chlorination. This well-known though expensive method extracted a very high percentage of the gold content of the pyrite, but prior to the abandonment of concentration regular work on a large scale by the Rand Central Ore Reduction Co. about 1898 showed that the same percentage extraction from roasted concentrate could be obtained by cyanide treatment as by chlorination, though the former process took twice as long. At Cripple Creek chlorination residues are ground fine in tube-mills and cyanided. This is in accordance with the fact that both cyanide and free chlorine are solvents of gold, though chlorine is far more rapid in its action, and indicates that the usually higher recovery by chlorination than by cyaniding is due to the former being generally applied to the porous particles of iron oxide formed by roasting pyrite, so that practically all gold is accessible, whilst cyaniding is practised on unroasted compact grains of pyrite in which some gold is encased, and hence mechanically inaccessible. At the present time chlorination has been universally replaced by cyaniding of the total tailing crushed to a much finer condition than formerly; this method yields a much higher profit per ton than the older practice, for though the extraction from the unconcentrated and unroasted pyrite is less than the former method would yield, yet the difference is more than off-set by the saving in concentration and subsequent costs.

The proposal to calcine banket ore before milling and thus render it more friable, as has been done with some ores in other countries, has the serious disadvantage that even in the absence of air a moderate degree of heat decomposes pyrite, driving off sulphur and leaving ferrous sulphide to produce all its detrimental effects during subsequent treatment.

Such chemical difficulties as do occur in the treatment of banket are usually due to weathering, before treatment, of the ore exposed in old stopes or in surface dumps, and are consequent upon the partial oxidation of pyrite, with consequent production of various acid compounds and oxygen-absorbing substances.

Brakpan Mines.

The linear development at the Brakpan Mines for the quarter amounted to 1,916½ feet, of which 1,563 feet were on reef averaging 8·7 dwts. over a reef width of 42·7 inches. The following were the results obtained from reduction operations during the quarter: Ore hoisted from mine, 153,244 tons; ore from surface dump, 4,566 tons; ore sent to crushing and sorting station, 157,035 tons; percentage of waste sorted out, 14·88 per cent.; average number of stamps running, 110; net running time, 81·723 days; ore milled, 130,019 tons; milling duty per stamp per 24 hours, 14·46 tons; declared yield in fine gold, 26·373 ozs.; declared yield per ton milled in fine gold, 4·057 dwts. Cyaniding: Tons treated, 130,491; declared yield in fine gold, 17,922 ozs.; declared yield per ton treated in fine gold, 2·747 dwts; total yield, 44,295 ozs. (6·814 dwts. per ton); gold in reserve, 3,800 fine ozs. The revenue from gold amounted to £186,421 (28s. 9d. per ton), the working expenditure to £115,706 (17s. 9d. per ton), the working profit to £70.715 (11s. per ton), and the capital expenditure to £4,642.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

INSTITUTION OF MINING AND METALLURGY.

Annual General Meeting—Mr. Hooper's Presidential Address—Growth of Mining Industry—Value of the Press.

The annual meeting of the Institution of Mining and Metallurgy was held at the rooms of the Geological Society, Burlington House, Piccadilly, London, W., on Thursday, March 21, 1912. Mr. H. Livingstone Sulman (retiring president) occupied the chair during the first part of the proceedings. The report presented by the Secretary on behalf of the Council showed that during the year 229 members were admitted into the Institution (including one honorary member and four readmissions of associates and students), and that there were 71 transfers to associateship or membership. The total membership at December 31, 1911, was 2,191, as compared with 1,902 on December 31, 1909, a net increase of 289 in two years. The total membership on January 1, 1902, was 803, the net increase in the ten years ending December 31, 1911, being 1,388.

The Chairman, in moving the adoption of the report and accounts, said that they had every reason to congratulate themselves upon the marked progress of the Institution in every direction, which the report and accounts indicated. Their membership increased not only normally, but it also showed a substantial and continuous upward acceleration. They had no need to glorify the work of their Institution, but it must be a matter of deep satisfaction to all to record its great and growing influence, not only in regard to their joint professions of mining and metallurgy, but also to that greater investing public the world over, to whose needs they had to give practical expression, and to safeguard whom was always their first duty.

Presidential Address.

Mr. Edward Hooper, who, on taking the chair, was greeted with loud applause, then delivered his presidential address, the title of which was "The Advancement of our Profession." Mr. Hooper said that it was only within the last 50 or 60 years that facilities for proper technical training had become adequately available. The Royal School of Mines, when established in 1851 as "The Government School of Mines and of Science applied to the Arts," was the only institution of its kind in existence in this country. This school nearly faded out of existence in Jermyn Street, owing to lack of funds and proper recognition by the Government of the day, and but for the exertions of certain old graduates (belonging for the most part to this institution), and the munificence of Sir Julius Wernher, the late Mr. Alfred Beit, and others, it would have ceased to exist as a separate entity. It was satisfactory to know, however, that the Royal School of Mines still preserved its separate existence, and was shortly (this year, he believed) to be housed in a capacious and exceptionally well-equipped building. It was with much satisfaction that he was able to inform them of the appointment of an advisory board for the Royal School of Mines, consisting of ten members, eight of whom would represent their Institution. (Applause.) The introduction of railways, steam navigation, electric telegraphy, etc., had all materially expedited the discovery and development of the enormous mineral resources of North America, South Africa, Australia, and other countries, finding employment for an immense number of people, as well as creating an ever-increasing demand for men possessed of the requisite technical knowledge. This demand for specially trained mining enginers had, of course, had its influence not only in the multiplication of mining schools, but in improving the methods and quality of teaching therein. The gradual increase and improvement of facilities for the acquisition of technical knowledge had kept pace with the discovery and development of new sources of minerals and metals all over the world, including the profitable working of many mineral deposits which owing either to their lowness of grade, or to their refractory character, could not be successfully exploited except by the practical application of scientific principles. Referring to the growth of the mineral industry, he said that the world's production of gold between the year 1861 and the year 1890 average less than 5½ million ounces per annum; but in 1891 the cyanide process was introduced on the Rand, and since that date the world's annual production of gold had enormously increased, amounting for the year 1910 to about 23,000,000 ounces. Some credit for this increased production belonged, no doubt, to the mining engineer, who had applied himself so successfully to effecting economies in the cost of mining, raising and transporting ore; but the larger credit was due to the metallurgical engineer who had so adopted the cyanide process to special conditions, that low grade deposits, which could not otherwise have been profitably exploited even subsequently to the introduction of that process on the Rand, had been worked to great advantage.

Specialisation.

In the growing tendency throughout all trades and professions to specialise, the members of their profession, and more particularly those belonging to their institution, had been among the foremost, with the result that they had contributed appreciably to the elevation of their professional status. For more years than he could remember, not only was a mining engineer supposed to know all about mineralogy, geology, and the working of mines (for which it was necessary to have a practical knowledge of mechanical and electrical engineering), but metallurgy in all its branches was included among his essential requirements. Even at the present day, there were no important universities of "metallurgy," although they had their school of "mines," and the "Mining" academy at Freiberg, the fact was overlooked that the metallurgist was a specialist, whom they, as mining engineers, gladly recognised as being no less important to the success of mining enterprise than themselves? The criticism he had to make with regard to their technical schools in general was not simply that they called themselves "schools of mines," but that they did not sufficiently discriminate between the duties of the mining engineer and those of the metallurgist, and cater for each accordingly. He maintained that they ought to have their schools for metallurgy as well as their schools of mines if the best advantage was to be taken of their student days. He did not mean separate institutions, but different time-tables, not merely in the third or fourth year, but from the commencement.

Standards and Definitions.

Referring to the subject of standardisation and definition, to which the Council of this Institution had devoted so much thought of late years, he said that the decisions taken in this matter must tend increasingly to the advancement of their profession in the esteem of the public, who, after all, were not only their critics, but also their employers. Why had they been at such pains to define "ore in sight," to standardise "weights and measures," to lay down general principles in regard to the allocation and grouping of expenditure upon mines and so on? Primarily, he believed, in order that the investing public might be protected. The Council of this Institution had rightly decided that no ambiguity or mystery should be tolerated in these matters, and had declared, in reference to "ore in sight" that such ambiguity would be regarded as an indication of dishonesty and incompetence. The three points that he pressed home were, first, that valuation of ore reserves should be made on the lines laid down by their Council; second, that a periodic checking of the mine manager's estimates of ore reserves should be made by an independent valuer; and third, that it was the bounden duty of mine managers, and should be regarded as a point of honour, to keep their boards promptly and fully informed as to the progress and results of development and exploratory work. With regard to the word "ton," it was obviously necessary that a definition should be made, and as obviously sensible that the "short" ton of 2,000 lb.—now almost universally used in metal mining and English speaking countries—should be chosen as the standard, in place of the older and more awkward "long" ton of 2,240 lb.

The Technical Press.

Among the influences that had contributed to the advancement of their profession, honourable mention must be made of the technical Press. Not only had there been a large increase during recent years in the number of periodicals devoted to mining and metallurgical interest, but their quality and value had become increasingly high with each succeeding year. They did not now glance at their technical journals merely to ascertain the output of mines in whose progress they were interested, or to learn what happened at some meeting of shareholders; they looked to these excellent periodicals for accurate and unprejudiced technical information with regard to mines all over the world, and for views of members of that profession on mining and metallurgical questions of pressing interest. The address concluded with a reference to professional ethics and the growth of technical societies.

A vote of thanks having been passed to Mr. Hooper for his address, the proceedings terminated.

Wolhuter Gold Mines.

The directors of the Wolhuter G.M. Co. notify the declaration of a dividend (No. 9) of 8¾ per cent. (1s. 9d. per share) for the six months ended the 30th of April, payable to shareholders registered on that date. The dividend will be paid as soon as possible after receipt of London transfers. The amount to be distributed is £75,250.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings, Box 2061, Johannesburg.

THE UNION MINERS' PHTHISIS BILL.

Employers and Miners—Proportions of Contributions—Scale of Compensation.

The following is a summary of the Miners' Phthisis Bill, which was introduced into the Union House of Assembly last week. It contains 26 clauses. In Clause 1 the description of "miner" limits the operations of the Act to whites, and the term "miners' phthisis" is taken to mean silicosis of the lungs. Clause 3 constitutes a Miners' Phthisis Board, consisting of a chairman and three other members, holding office for three years, one member to be nominated by the owners and one by the miners.

Funds and Contributions.

Clause 4 provides for the establishment of a fund, and Clause 5 for contributions to the fund. This Clause reads as follows:—(1) From a date to be notified by the Minister in the *Gazette*, there will be payable to the fund by every employer a contribution in respect of every month as from the first day thereof, as follows: (a) In respect of every person employed during the month as a miner and working on any percussive rock-drilling machine, the sum of six pounds. (b) In respect of every person employed during the month as a miner, but not working on any percussive rock-drilling machine, the sum of three pounds. (2) The employer shall deduct from the wages or pay of every such person one-fourth of any amount contributed under this section or under Section 7 by such employer in respect of such person. The Clause then provides for proportionate payment for employment during part of the month, and for correct returns. It also lays down that contributions are to be paid by the 10th of the succeeding month. Under Clause 6 the accounts are to be kept by the Board, and the balance sheet and accounts are to be audited by the Controller and Auditor-General, whose report is to be laid before Parliament. Clause 7 makes provision for the annual valuations of the fund by an actuary. It lays down that if the valuation discloses a surplus beyond the estimated liabilities existing and accruing of the fund the contributions by members shall be reduced as the Minister may determine, while if a deficiency is disclosed the contribution shall be increased.

Claimants for Compensation.

Under Clause 8 claimants for compensation have to satisfy the Board that they have been employed underground for a period or periods amounting to at least two years of the four years immediately preceding the date of the claim on any of the mines in which the mineral dust produced is such as to cause miners' phthisis, and a list of which the Minister is obliged to publish under Clause 2.

Powers of the Board.

Clause 9 deals with the powers of the board incidental to the consideration of claims, while Clause 10 lays down that the decision of the board is to be final and not subject to review by or appeal to any court of law. Clause 11 states the amounts to be awarded, and its main sections read as follows:—Subject to the provisions of this section the benefits to be awarded under this Act shall be: (a) To a miner who shows definite physical signs of miners' phthisis, and whose capacity for underground work is thereby not seriously or permanently impaired, the sum of eight pounds per month for one year; (b) to a miner who has contracted miners' phthisis in a marked degree, and whose physical capacity for underground work is thereby seriously and permanently impaired, the sum of eight pounds per month; (c) to the widow of a miner who is proved to the satisfaction of the Board to have died from miners' phthisis while a beneficiary under this Act, or while his claim to any benefit thereunder is being investigated by the Board, the sum of three pounds per month for a period of ten years, and in addition the sum of one pound per month for each child as long as such child remains under the age of sixteen years.

Then follow a couple of provisions stopping the allowance to the widow if she remarries and providing for payment to a guardian if the miner does not leave a widow surviving him.

Computation of Compensation.

The second section of the Clause empowers the Board to commute compensation to the amount of the estimated value of the remainder of the payments discounted at 4 per cent., compound interest, while the third section reads: Any beneficiary under this Act may at the discretion of the Board be granted a free passage to a place outside the Union, and on arrival at his destination he shall be paid one-half of the balance remaining after deduction of the cost of such passage from the amount calculated as in sub-section 2 of this Clause. The Boad is also empowered to give ten pounds towards the funeral expenses of miners dying from miners' phthisis.

Medical Examination.

Under Clause 14 employers are compelled to have applicants for underground employment medically examined in cases of applicants not previously employed on mines. Clause 14 provides penalties up to £100 or six months for any miner who works underground in any of the mines in the prescribed list who has been a beneficiary under the 1911 or the present Act, or who works underground in any mine knowing that he is suffering from tuberculosis of the lungs. The employer of such miner is liable to the same penalty. Clause 18 empowers an executor to continue the claim of a miner dying from miners' phthisis after making his claim. Clause 19 prescribes the benefit to native labourers suffering from miners' phthisis, which is deemed to be a personal injury arising out of his employment which should be recompensed under Section 22 of the Native Labour Regulation Act of 1911. Clause 20 prohibits contracting out, while under Clause 21 the benefits under the Act cannot be assigned and are not executable. Clause 22 gives the Minister power to make a medical examination of every miner in a mine for the purpose of ascertaining the prevalence of Miners' phthisis, and provides a penalty of £50 or three months for a miner failing, when required, to submit himself to examination; while under Clause 24, persons who have received allowances under the 1911 Act are entitled to receive benefits under the present Bill.

TRANSVAAL CHAMBER OF MINES' MONTHLY REPORT.

Labour, Phthisis and Death Duty Questions.

The report of the Executive Committee for last month states:—*Native Labour.*—The returns supplied by the Witwatersrand Native Labour Association, Limited, show the following results for the month of March:—Number of natives employed by members of the Association on last day of month (including natives in the service of mine contractors, but excluding natives in the employ of members of the Association in the districts of Barberton, Breyten, Rooiberg and Louis Moore): On gold mines: February, 190,320; March, 196,748; on coal mines: February, 7,922; March, 98; on diamond mines: February, 10,789; March, 12,071; total: February, 209,031; March, 217,017. Recruiting Results.—The Witwatersrand Native Labour Association also furnishes the following information with regard to the natives recruited by the Association and its members during the month of March, 1912, and the districts whence they were obtained. These figures do not include natives recruited by mine contractors. The corresponding figures for the month of February are given for the purpose of comparison. Source.—East Coast (south of latitude 22 deg. south), February 4,144, March 5,190; (north of latitude 22 deg. south), February 1,986, March 3,213; Cape Province, February 4,246, March 3,230; Transvaal Province, February 1,116, March 1,073; Basutoland and Orange Free State Province, February, 825, March 1,194; Bechuanaland, February 205, March 279; Natal Province, February 362, March 461; Swaziland, February 109, March 154; Rhodesia (including via Pietersburg), February 187, March 253; local, February 9,430, March 10,29, total, February 22,610, March 25,341. Natives Employed in Labour Districts of Transvaal.—The monthly report issued by the Department of Native Affairs shows that at the 29th February, 1912, 314,583 natives were employed in labour districts of the Transvaal. Of this number, 223,218 were engaged on mines and on the various classes of works specified in Part I. of the Coloured Labourers' Health Regulations, 1906, and 91,365 were in other employ.

Draft Miners' Phthisis Act, 1912.—A Bill was published in the "Government Gazette Extraordinary" of April 3rd, making provision for persons who have contracted miners' phthisis. The matter is at present under the consideration of a Sub-Committee of your Executive, and representations will be made on the Bill to the Government.

Thirteenth South African Medical Congress.—In connection with the visit to Johannesburg of the Members of the 13th South African Medical Congress, the Chamber has made arrangements for visits to some of the mines by the visitors, so that they may be able to see the actual working of the gold mining industry, and by observation at first hand, to judge of the conditions of the mine hospitals, native compounds, and other matters in which the medical profession is directly interested.

Draft Death Duties Act, 1912.—The Chamber has made representations to the Government on the above Act to the effect that it is inequitable that Companies should be compelled to collect on behalf of the Government from shareholders residing outside the Union, and has submitted that the proper principle is that taxation should be confined to property actually within the Union. It has also been recommended that small estates should be exempt from the fixed duty in accordance with the principle existing in the Transvaal Act, and that, in view of the onerous nature of the fixed duty of five per cent. on all shares held by shareholders not resident in the Union, the exemption of small estates should be raised from those of an aggregate net value of £2,000 to that of £5,000.

Representation.—The following changes in representation have taken place: Cinderella Consolidated G.M., Ltd., Mr. H. W. Dalton *vice* Mr. A. French; Consolidated Goldfields of S.A., Ltd., Mr. D. Christopherson *vice* Mr. E. Birkenruth; Robinson Deep G.M. Co., Ltd., Mr. J. D. Low *vice* Mr. D. Christopherson.

THE PRESENT STATE OF THE RAND MINING INDUSTRY.

Mr. W. L. Honnold Discusses Recent Developments and Describes the Prospects for the Future.

The following interesting speech was made by Mr. W. L. Honnold in proposing the toast of "The Mining Industry" last Saturday night at the dinner of the South African Institution of Engineers:—

"I must confess that when first asked to propose the toast of 'The Mining Industry' I felt some misgiving. The thought came to me that in view of the somewhat disconcerting record of the past year it might be more conducive to the proper spirit of such an occasion as this if someone other than an engineer proposed the toast. But I was met with the rejoinder that, since Sir George Albu was to respond, any gloom which might be cast by my remarks would be quickly dispelled by him. Well, that was not entirely convincing, for, personally, I believe that even Sir George's genius for seeing the bright side of things has its limitations. Anyway, I finally consented, and I am glad I did. For, as a result, I have come to recognise more clearly that the present bad showing is more apparent than real, that our troubles are largely subject either to correction or explanation, and that, taking the position as a whole, one is warranted in toasting the industry in a hopeful spirit. This, of course, does not mean that we are in the way of realising all our previous hopes, or that it will ever be so, but rather that, in a broad and comprehensive sense, the mines themselves at least are still essentially much the same as we have found them in the past, a mixture of good, bad and indifferent, fairly consistent as to aggregate significance, but varying and variable as to their occasional aspect and as to individual details. But, gentlemen, that is mining, and, in our case, mining in as perfect a state potentially as has ever been known.

Things Not So Bad As They Seem.

"Now just a few points in support of my contention that things are not so bad as they may have seemed. First, let us take the matter of average grade or recoverable value. From the showing of statistical records it would seem that 27s. 11d. for last year as against the previous average of 28s. 6d. is indicative of a lowering tenor. On analysis, however, we find that the drop may fairly be attributed to influences which should be regarded as abnormal. For example, it is clear from evidence already a matter of record that in one important instance an unbridled scramble for tonnage resulted in a reduction in grade equivalent to about 4d. per ton on the entire tonnage of the Rand. There are other instances which, although not officially admitted, provide such convincing evidence as to justify the assumption that a similarly mistaken policy led to a further lowering of the grade equivalent to at least the remainder of the drop. Personally, therefore, I feel that as regards grade there is no evidence of intrinsic decline during the past year, and I shall not be surprised if this year should show distinct improvement.

Working Costs.

"As to working cost, the situation is less satisfactory. The records of the past year show an average increase of 5d. per ton, the significance of which, however, is not altogether clear, some of the factors involved having a positive and others a negative bearing. Amongst the positive influences we have to consider that certain charges were included in costs which would have been placed against capital could it have been raised on satisfactory terms; also that, apart from charges of this nature, there were others debited properly to working costs but representing work of a preparatory character, the benefits of which are yet to be realised. Needless to say, the charges coming under these two headings were materially augmented in consequence of the fact that certain companies, more particularly those representing recent amalgamations, were passing through a transitional period, especially in regard to alterations called for in consequence of the change in power conditions. We have further to consider that there was a tendency to increase costs due to a sane application in some instances of the principle of so-called selective mining. Of the negative influences tending to a reduction one has to recognise that there was abuse in other instances of the equally important low-cost principle. And of course there was the decreasing influence due to that improvement in efficiency which we must assume as always in process even although it may not always be obvious. But, no matter what measure of consolation we may draw from these various considerations, we are in the end left face-to-face with two disagreeable facts—first, that generally speaking our efficiency was still much below what it should be; secondly, that there was a direct and material increase in costs owing to the greater expense of native labour. Whether or not this increase in the cost of labour should have occurred, whether and to what extent it is still open to restraint, if not correction, are questions on which Sir George may possibly speak with more freedom than I am disposed to venture. I may, however, go so far as to question whether the shortage of labour was ever so serious as to have called for the policy pursued in respect of both its recruitment and payment. And I may suggest that, in view of the past year's progress in the matter of machine mining, there is reason for thinking that the position can be rendered still less serious.

The Dividend Record.

"Finally, just a word on the subject of profit as reflected in the dividend record, for unquestionably the official figures of last year are misleading as to the essential position. Baldly stated, these figures show that the dividends paid amounted to £1,112,999 less than in the previous year. But when one goes into detail he is bound to recognise two consoling considerations. First, the qualifying influence of the abnormal factors referred to in connection with the matters of grade and working costs. Secondly, the fact that about £1,300,000, or more than the equivalent of the shortfall in dividends, was appropriated to capital expenditure, most of which would clearly have been available for dividend had the money market been favourable to the provision of new capital as contemplated. So that, even when put to the test of dividends, the industry offers a measure of reassurance.

"Gentlemen, I beg to propose the toast of 'The Mining Industry,' and I am sure you are all glad that it is to be responded to by Sir George Albu, one of the industry's most loyal and persistent supporters."

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THE GEOLOGY OF THE WITWATERSRAND.

The Importance of Old Records—Is Unanimity Possible on Rand Geological Questions?—Dr. Mellor Replies to his Critics.

DURING the last discussion of Dr. Mellor's recent paper on "The Lower Witwatersrand System on the Central Rand," Mr. Sawyer contributed the notes quoted below. Dr. Mellor then replied to the criticisms which still remained unanswered. In view of the importance of the subject, it was generally felt that the usual procedure of keeping a paper open for discussion for two meetings only, subsequent to the one at which it was read, should not be followed in this case, and on the motion of Mr. W. Bleloch, seconded by Mr. J. P. Olver, it was resolved that the discussion on Dr. Mellor's paper be left open until such time as the President declared it closed.

Mr. Sawyer said :—In support of Dr. Mellor's statement that the view "that the Rietfontein and Langerman's Kop beds are normally interbedded, and occupy a definite horizon, in the Lower Witwatersrand System, is by no means new, etc.," I may state that I inquired into the probable continuation of the Rietfontein reefs in the Geldenhuis Estate, and wrote a report for the Geldenhuis Estate and Gold mining Company on the 14th March, 1899—that is thirteen years ago—in which the following occurs :—"Four distinctive groups occur on and about your estate; (1) the Witwatersrand Banket Formation containing the Main Reef series; (2) the Old Slates formation outcropping to the north of the above and underlying it, in a geological sense; (3) granite, decomposed in part, gneiss, quartz-schist, etc., which underlie the first two formations; (4) basic igneous rocks (diabase, quartz amygdaloidal diabase, felspar porphyry, etc.). The relative positions of these groups are fully shown on the accompanying plans and sections." The plan I published in my paper on "The Transvaal Kromdraai Conglomerates," published in 1904. "The Witwatersrand formation and the Old Slate formation (as they were then called) which underlies it have been subjected to great lateral pressure, acting mostly from south to north. They have been dislocated, and the dislocated masses have been driven forward over each other along more or less oblique thrust-planes. The earth-movements have induced over-folding and over-thrusting to such an extent as in many cases to considerably alter the original relationship of the beds (see Section No. 11).. The Main Reef Series has been thus duplicated on the adjoining farm Driefontein, notably in the Witwatersrand Gold Mining Company's property, where the dislocated portions are separated by a wide dyke running east and west. The various beds in the Old Slate formation are most irregular. In some places they dip to the north, no doubt in depth turning to the south again. They are most frequently quite vertical near the surface. . . . They are traversed by dykes, it being frequently difficult by a surface examination to distinguish between slate and dyke matter. The slates which are usually on the surface are in part very slaty, in part lumpy, and contain pieces and pebbles of quartzite and sandstone (see Section No. 2). Their course is frequently erratic, thus pointing to an igneous origin. This irregularity may, however, to some extent be accounted for by their plasticity when exposed to the grinding and crushing effects of the lateral pressure to which all these rocks have been exposed. The granite group contains gneiss and quartz-schist resting upon the granite and underlying the Old Slate formation. I have discovered their schists, and I believe this is a new discovery, at the foot of the southern ridge of quartzites and slates, as shown on the plan. Decomposed granite also appears to have been exposed in a prospecting shaft beneath a sheet of decomposed igneous rock weathered to a red earth-kaolin. . . can still be seen on the debris heap of this shaft. A . . . . dyke separates the formations between Rietfontein and Barrett's Rietfontein. There is evidence of the occurrence of these schists (quartz schists) on the western side of the small dyke up to which the Du Preez reef has been traced at Rietfontein; in the form of grey clay containing small pieces of quartz-schist (Section No. 3). Although I have not been able to discover any evidence of the occurrence of these rocks north of the quartzites . . . at Rietfontein owing to the diabase sheet reaching right up to the quartzites, I am of opinion owing to their occurrence so near the Du Preez reef, as stated above, that they occur in close proximity to these quartzites, though hidden . . . . by the sheet, and that the Du Preez reef is therefore, if present at all, contained within one of the very lowest quartzite beds of the Old Slate formation." The discovery of these schists at the foot of the southern ridge is therefore so far of importance that they bound the zone in which the Du Preez reef may occur to the north. along the southern ridge. "Much surface prospecting has in years past been carried on all over the southern ridge and at its base with a view to finding the Du Preez Reef, so far, I believe, without success. The prospecting at the base of the ridge appears to have only exposed igneous rock and slates." I expressed the opinion in my paper on "The Origin of Slates Occurring on the Rand, etc.," read before this Society in 1903, that in the main the slates occurring on the Rand are of sedimentary origin, but since then I have had doubts as to the origin of a good many of those occurring in the Lower Witwatersrand System. It is difficult to make a rock slide of the more disintegrated slaty strata, at surface, so that it is not always easy to examine them in that way. Most of the "slates" from the Lower Witwatersrand System which I have examined from borehole cores, and therefore unweathered, contain chlorite as a ground mass with. in some cases very few, more or less angular quartz grains. Chlorite being an alteration product of mineral constituents of ingneous rocks, as seen in many rock slides, and some of the quartzites are highly chloritic too, what is the origin of this chlorite? Have some of the ferruginous slaty shales described by Dr. Mellor as occurring in the Jeppestown Series, an igneous origin; in other words could they represent igneous intercalated dykes in depth? I have noted that at the Coronation slate—the outcrop itself—the north point of the compass was attracted, whereas the outcrop of one of the other slates repelled the north point. There may be nothing in this, but perhaps some other members have noted this fact.

Replying to the foregoing, Dr. Mellor said :—Mr. Sawyer's discussion of my paper comes as an opportune illustration of a point to which I recently drew attention,* that if the purely geological observations made by engineers while engaged on reporting on private properties were made accessible by being placed on record in the pages of some scientific journal considerable assistance would be afforded to subsequent workers. Many examples might be instanced of detailed and elaborate work being done in various areas, including the Rand, which must have yielded results of purely geological value, of which no record has been made accessible. In the text of his paper on the Kromdraai Conglomerates, Mr. Sawyer makes no reference to granitic rocks in the Bezuidenhout Valley, and the description of these occurrences on his map as "quartz-schists and kaolin" is not such as would give one to understand that the rocks in question represented the old granite. As shown, however, by the private report from which he now quotes, Mr. Sawyer recognised the existence of granite in the Bezuidenhout Valley, a fact of which I was naturally not aware at the time of my survey of that area. From the presence of the granite Mr. Sawyer drew the inference that the quartzites immediately above were the Orange Grove quartzites and correlating these with the quartzites containing the Rietfontein Reefs further inferrred that these reefs were to be looked for about the horizon of one of the very lowest quartzites of the Old Slate formation, that is the Orange Grove quartzites. Mr. Sawyer does not say whether he still holds this view. It seems, however, very difficult to place this interpretation on the observed facts both with regard to the correlation of the quartzites and the position of the Rietfontein Reefs, since the quartzites are so dissimilar to those associated with the reefs, and. on the other hand, present such close resemblance to the Hospital Hill quartzites. Moreover, they can be seen to be separated from the granite in several places by shales which include typical outcrops of the contorted bed. In his discussion of my paper, Mr. Olver expresses the opinion that it is desirable that the Geological Society, as a body, should arrive at some uniformity of opinion on various questions in Rand geology. It is doubtful, however, whether such unanimity is either possible or desirable. Difference of opinion in any society is always a healthy sign of vitality, and the appearance of the adoption of any special views by the society as a body, were it possible, would have an unfortunate effect in discouraging further work, especially on the part of younger members, from whose fresh interest we might expect additions to our stock of observations at least, if not to our theories. I can assure such members that there is still a fruitful field for close observation on the Rand. It is satisfactory that my papers have at length been the means of raising some discussion. It was not to be expected that such discussion would lead to general agreement. As stated in the introductory portion of my first paper, my main object was not to advocate any particular view of local geology and to seek to convert others to it, but to present as fully and in as convenient a form as possible the available evidence, including much that was new, for the use of those who wished to form an independent opinion. That my paper should not pass without criticism appeared desirable in order that the views of others, and the evidence which they considered specially favourable to those views, might also have an opportunity of statement at a time when interest in the question was being renewed. This object will, I believe, be accomplished by the present discussion, even if it fails in bringing about any general agreement. It is a somewhat unsatisfactory condition of work in connection with Rand geology that almost every possible view, as well as many combinations of views, and also reversals of views, have already been expressed, often very indefinitely, on almost every particular question, and consequently that anything now written must appear to have been more or less anticipated by some previous writer. In preparing my papers it was originally my intention to give a comparison of the conclusions arrived at with those of previous workers in the same field, but I found myself so often in such partial agreement on some points and such total disagreement on others with the same individual that it seemed best to leave such comparisons to those interested in any special view. One difficulty in these comparisons is to follow the various modifications of opinion expressed at different times by the same authors, and one benefit which may result from the present discussion is the opportunity it offers for those of our members who are specially interested in Rand questions to clearly state their present position. Discussion on any of the debatable points in Rand geology can always be reopened when any really new evidence is available, by the reading of a paper, however, short, before this Society, and had Mr. Olver pursued this course at the time of publishing his recent book, his views would probably not have been received with the silence to which he refers. Mr. Olver has set forth his conclusions at length in his book, and there is consequently no danger of their being overlooked. The main point led up to by his study and exposition of local geology—the probability that is of the existence of an extensive body of the Main Reef series to the north-east of Rietfontein as a result of the action of certain faults whose characteristics he has studied in the West Rand, is a point which lies beyond the scope of my paper. With regard to the existence of those separate faults at Rietfontein and their individual identity with those which Mr. Olver considers can be traced about Witpoortje I find it difficult to follow the evidence. Although I have not dealt with the Witpoortje Break in my paper, Mr. Olver is wrong in assuming that I was unacquainted with it at the time my papers were written. My practice, which I find a very wholesome one, is not to write at any length about any particular area, till my field-work is well beyond it. I know of no reason, nor does Mr. Olver make clear, why his Witpoortje fault should be brought along the strike of the formation from near Roodepoort to Parktown, and still less why it should be further prolonged through the granite area to the north to come into play on the north side of Rietfontein. In a similar way Mr. Olver's Orange Grove fault is taken for many miles through the granite area, where outcrops are exceedingly rare, without any evidence being adduced in favour of such a course, and his North Rand fault in the same way is brought for many miles along that particular zone which runs north of, and parallel to, the Main Reef (corresponding to the horizon of the Jeppestown beds), which is almost everywhere so covered with overburden that there is practically no possibility either of proving or disproving the presence of a big fault on this line. On the other hand, those who attempt to follow the course of the Rietfontein fault described in my papers and maps will find that its course is marked almost along the whole length by the plainest evidences of disturbance, from which, indeed, its existence was entirely inferred. Mr. Olver has clearly given very careful study to the question of faulting on the scale on which such disturbances are met with in Rand mining, and his exposition will no doubt be widely appreciated; but when he treats of similar phenomena on a regional scale in dealing with Rand geology, it is more difficult for geologists accustomed to extensive field-work, to follow him, and the carrying of faults for many miles through obscure zones of country, to be reproduced in explaining the geology of a distant and complicated area, makes demands which few geologists will be willing to concede; and when, further, it is necessary to make the faults in their course through obscure country intersect, as do Mr. Olver's Orange Grove and Witpoortje faults on Bedford Farm, apparently in order that they may have their proper throw in the new area, it is not surprising if a feeling of mystification should be induced, even in the technical mind, which discourages the acceptance of Mr. Olver's views.

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*Pres. Address, Geol. Soc. S.A., Proceedings, 1912, p. xxx.

(*To be continued.*)

THE S.R. DEEP MAKES ITS FINAL REPORT.

Capital Expenditure for Last Year £72,806—Surface Equipment Completed—Faults and Value of Reef in Depth.

For the year ended 31st December, 1911, the South Randfontein Deep showed a debit balance of £3,701, which has been carried to the balance sheet. The expenditure on capital account during the year amounted to £72,806, made up as follows:—Central shaft, £28,580; headgears, £1,739; machinery and plant, £20,010; buildings, £5,527; reservoirs, dams and permanent surface works, £302; prospecting (boreholes) £1,553, mine development £14,956, total £16,509; live stock and vehicles, £136; furniture, £64; total, £72,871. The consulting engineer, Mr. W. McC. Cameron, in his report, states:—"Details of the work done during the year and description level by level, together with assay values of reef calculated over a milling width of 36 inches, are given in your Manager's report. The Main Incline Shaft was sunk 962 feet to a total depth of 1,175 feet on the incline, passing below Randfontein Leader, when it was turned between the two reefs at 717 feet to the dip of the formation, namely, 35 degrees. Seven levels were started from the shaft. As will be seen from the Manager's report, the first level simply served as a connection to previous workings from the outcrop; the 2nd, 3rd, and 4th levels met with ground so broken by faults and dykes that the Randfontein Leader could only be picked up in one place in the 3rd Level West, and West Reef not at all. This latter reef was found to be faulted in such a way that it need not be prospected for above the 6th level. On the 5th level the Leader has been driven on for a considerable distance: on the 6th level both the Leader and West Reef have been opened and driven on, and on the 7th level the West Reef, the crosscut to Leader at this level having not yet reached the reef. The values encountered on the two reefs have been unpayable, and therefore disappointing, but while in the upper levels the ground was so broken that only small pieces of reef could be found, on the 5th, 6th, and 7th levels the reef is more or less continuous, and furnishes strong evidence that the extensive faulting in the upper levels which is due to the proximity of the great Witpoortje fault zone, is decreasing with depth, where owing to the north-easterly strike of this fault zone, the workings are further removed from it. There is reason to expect that this feature of faulted ground will be less prominent in the area below the 7th level yet to be explored, and that better values may be encountered. The total reef-bearing area prospected thus far down to the 7th level amounts to 22 claims on Leader and 18 claims on West Reef, leaving 67 reef-bearing claims on Leader and 75 claims on West Reef yet to be explored. The 962 feet of shaft sinking done during the year was accomplished at a total cost of £29 14s. 2d. per foot sunk, including ore bins, pump stations and sumps, and 3,654 feet of development, cross-cuts and drives at a cost of £4 1s. 11d. per foot, which, considering the small number of points of attack available over which to spread standing charges, shows commendable work on the part of your Manager and staff. The surface equipment of the mine was completed in the early months of the year, and your mine is now well provided with a compact plant for development purposes."

The tenth monthly meeting of the South African Institution of Engineers in its present session will be held in the council chamber of the Chamber of Mines this (Saturday) evening, at eight o'clock. The meeting will be of particular interest, as Mr. A. F. Williams' reply to discussion on his paper, entitled "The Kimberley System of Hauling," will be read. Mr. M. I. Williams-Ellis will read a paper, entitled "The 'Cascade' Single and Multi-Speed Motor." Mr. R. B. Greer will read a paper, entitled "The Margin of Safety Required for Man Haulage at Great Depths." Mr. A. S. Ostreicher will reply to discussion on his paper, entitled "The Manufacture of Turbines as a Future Industry." Besides these, discussion will be continued on Mr. A. S. Ostreicher's paper, entitled "Loss due to Impact in Californian Stamps," and on Mr. A. E. Blevins' paper, entitled "The Evolution of Printing and Type-setting Machines."

E. J. MOYNIHAN,

CONSULTING ENGINEER.

PLANS, SPECIFICATIONS, REPORTS AND ADVICE, MINING
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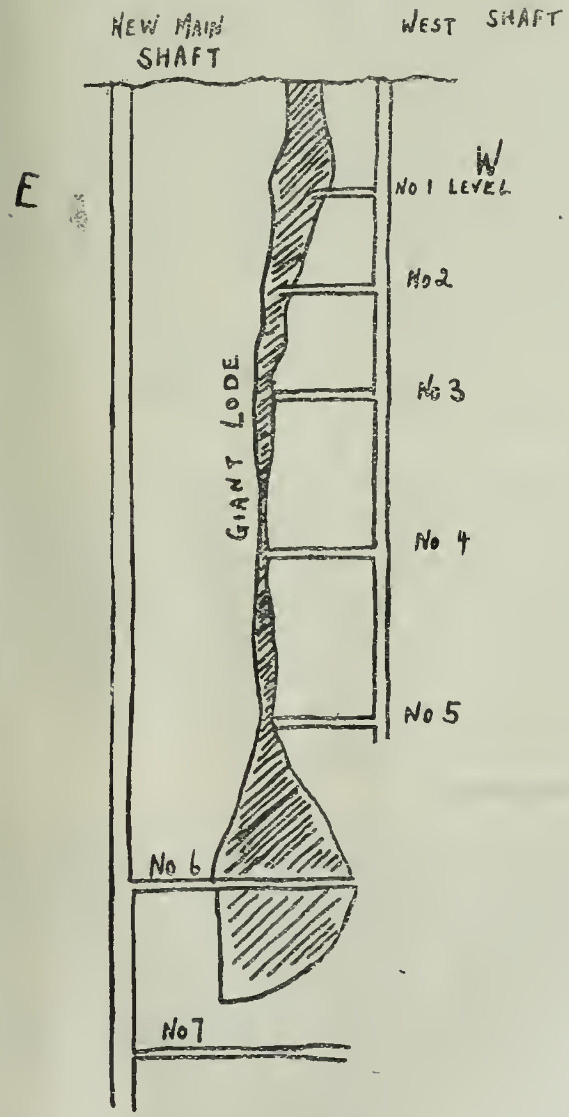
Rhodesian Section.

LATEST MINING NEWS.

Giant Mine Borings—Water Shortage in Rhodesia—The Farvic to be Closed Down—Mr. Triggs Acquiring Claims in Matabeleland—Development Results at Some Leading Mines—Smelting Policy in the Katanga—Congo Coal.

For months past the Giant Mines of Rhodesia at Gadzema have been boring with a view to locating the lode below the sixth level. At about the sixth level between the old and new main shafts, a big lenticular mass of ore was encountered. In places the width of the ore body at this depth was no less than 140 feet. Early in 1911, however, this wide ore body was found to pinch out below the sixth level. A little more than a year ago, on the advice of Dr. Corstorphine, boreholes were commenced to be sunk below the seventh level. Various rumours have been in circulation as to the results of these borings, and accordingly much interest attaches to Dr. Corstorphine's latest report on the mine. The well-known geologist has stated his opinion that the exploratory boring already done has very far from exhausted the possibilities of the lode existing below the seventh level. The third borehole cut a mineralised portion of rock, to some extent resembling the body of ore. A borehole—No. 7—has been put down to intersect this. Borehole No. 8 has been located to go down vertically in a zone not yet explored and to a depth greater than any previous hole. Even after completion of boreholes other zones remain to be explored. The consulting engineer, it is interesting to observe, agrees with Dr. Corstorphine as to the direction of further boring, and states he shares the consulting geologist's opinion as to ultimate success. The recent not altogether satisfactory developments on the Giant have had a depressing effect on Rhodesia generally, for the Giant has always been regarded as one of the leading mines of the country and one which has perhaps more than any other given indications of permanency and endurance in depth. The ore bodies are lenticular in shape, and in places are of great width. The accompanying transverse section through the Giant Mine gives one an idea of the general shape of the ore body and the manner in which the lenticular masses of auriferous ironstone and schist, after widening out below the fifth level, appear to have pinched out between No. 6 and No. 7 levels.



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The outlook for mining during the coming dry season is not regarded as any too hopeful on account of the acute shortage of water. Advices from Rhodesia state that one battery will shortly be closed down, largely on account of water scarcity. This is the Queen's West, and a four years' highly successful tribute will come to an end on the 30th. The water shortage is not the only reason, Messrs. Cumings and Berry having other interests in the district which no doubt have contributed to their decision to close their connection with the Queen's West. Their main interests (the Imbusine and the Up-to-Date) are near the Elumba Mine, on the former of which they will probably re-erect the Queen's West plant.

*   *   *   *

The directors of Rhodesia, Limited, notified in mail week that they would probably close down the Farvic mine at the end of March. They are working the property on tribute. Arrangements are being made to cease work on the property mainly owing to the expiration of the tributing lease. These arrangements will come into force within the next week or two. It is said that the owners of the mine are preparing themselves to carry on operations on taking over the property again from Rhodesia, Limited.

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Mr. P. S. Triggs, of Eileen Alannah and Gatooma fame, is actively identifying himself with mining in Matabeleland. Amongst other interests he has recently acquired an option over the Ettie claims from Mr. R. Smith. This is one of the rich reefs in which Bembesi abounds, is proved to considerable depth, and has a fair strike. Fabulous values have been encountered in the development work executed, and the mine has now arrived at a stage when capital is necessary to exploit it at greater depth. Trial crushings have given over an ounce extraction, but, as the tonnage crushed included a large proportion of rubble, the clean reef extraction, all round, should be well in the region of 30 dwts. Mr. Triggs has also secured an option over the Stocks Luck Mine held by Messrs. Smith and Ryan. Here again is the necessity for capital emphasised. Pegged originally in 1904 by Mr. Ryan, a mill was erected upon it when the only shaft on the mine was some 30 odd feet down. The crushing from the mine ran nearly an ounce, but the tonnage was but small, and the mill was then moved to the Queen's Mine to crush the development rock there. But little work was afterwards done on the mine on account of water, and after changing hands several times the claims finally came back to the original owner and Mr. Smith. Two winzes have been sunk and good values maintained in both, in fact the prospects are as bright as anyone could wish. The fact that values have continued below water level is one of the most encouraging features in a most promising venture.

* * * *

Development appears to be progressing favourably at the largest and most important of the Rhodesian mines. During February the No. 6 level of the Lonely Mine, south drive, was advanced 435 to 465 ft., average width is 36½ ins., average value is 6 dwts. No. 7 level, south drive, 470 to 550 ft., average width is 20·5 ins., average value is 14 dwts. 14 grs. Winze No. 1 (from No. 7 level), 70 to 80 ft., average width of reef is 56·50 ins., average value is 1 oz. 13·57 dwts., not all exposed.

* * * *

According to a recent cable, at the Eldorado Banket G.M. Co., on the No. 9 level, "reef continues to look extremely well; average assay value so far of 15 ft. in drive 1 oz. over 64 ins. width after reduction high values." It may be remembered that when the reef at the 9th level was struck the assay was 12 dwts. across 60 ins., and that the next section assayed 32 dwts. across a similar width.

* * * *

As to the Shamva, the following is a copy of a cable which was despatched from the local office of the company to the board of the Shamva Mines, Ltd., in London, last week:—"3rd level, No. 4 crosscut north, cut reef assaying 19 dwts. for first 5 ft." This cable was supplemented by another despatched later as follows:—"3rd level, crosscut No. 4 north, so far exposed 10 ft. of reef on an average assay value of 18 dwts.; reef continuing."

* * * *

The Elisabethville paper, *L'Etoile du Congo*, makes some very outspoken statements on the policy of the management of the Union Miniere and Tanganyika Concessions in a leading article. It is clear that something is radically wrong in connection with the smelting policy pursued there, and the plain straightforward statement of the Katanga journal accordingly is instructive. The paper says:—"There has been some talk lately about a dearth in the world's supply of copper, and many people interested in the Union Miniere have been bewailing the fact that the mines under the control of that company were not yet far enough advanced to supply the deficiency. In Katanga the lowest assay of ore found in any of the Union Miniere properties, so far, has shown 7½ per cent. of copper, whereas in a great many American mines, which are worked at a profit, the percentage is very much less. Of course, America has a great advantage over a country like Katanga, for in the United States the production of copper is not the monopoly of one particular company, and consequently there is a large number of competent and experienced mining and metallurgical engineers whose knowledge is at the disposal of mine managers; and as there is a difference in the kinds of ore found in the various localities, their knowledge, gained by practical experience, is of inestimable value. Because one particular treatment has been found to answer in one particular locality it does not follow that it will be equally successful in another place where the ore is different. This has been thoroughly realised in the United States, where mining experts study the several species of ore, examine the manner in which it is found and the topography of the country, and ascertain on the spot the best way to treat the ore found there. And in America they lose no time and spare no expense when they find that a particular process is necessary for the successful production of copper."

* * * *

In Katanga it appears as though time may be wasted with the greatest prodigality as long as there is a slight saving of expense. That it is really false economy does not seem to occur to the company, which practically controls the whole of the copper in the country. The work jogs along in an aimless fashion by fits and starts. The smelters run for a month or two and then stop while the managers argue as to whether there is not a cheaper and more satisfactory process to be found for producing copper. Presently they continue again in the old way until people begin to believe that somebody has really solved the problem of how the ore should be treated, then all of a sudden work is again suspended. A little wholesome competition would do the Union Miniere a power of good, and it is unfortunate that the monopoly prevents a few go-ahead syndicates from shaming them into some semblance of sensible activity. As it is they know that they have nothing to fear from competitors, and we suppose that, despite the fact that Katanga copper commands a better market price than any other, they will continue their cheeseparing, unenterprising methods until, at last, the voices of shareholders, uplifted in righteous wrath, convince the directors that it is high time to cease quarrelling among themselves as to the respective merits of British, American or Belgian ideas, and make up their minds to face the situation seriously and sensibly. 'Tis a consummation devoutly to be wished, and we hope the shareholders will lose no time in giving stentorian vocal expression to their feelings of disgust."

* * * *

Coal measures appear to be distributed over a great deal of the Congo Free State. Indications of coal are reported to have been discovered near Albertville, on Lake Tanganyika. Coal has also been discovered elsewhere in the Katanga, at Shiwa and Luweisha, on the Upper Lualaba, and in the country crossed by the Lubudi River and by the Lovoi River, two western tributaries of the Upper Lualaba River. The Shiwa coal has no calorific value, and as to the Lubudi and Lovoi coal, there is no news as yet as to its value. Lignite (brown coal) has been discovered in Katanga, on the south-west of Lake Mweru.

The Golden Kopje Mines.

At the meeting of the Golden Kopje Proprietary Mines, held in London in mail week, Mr. E. Birkenruth, who presided, made some interesting remarks on the property, which is situated 17 miles west from the Eldorado Mine and railway terminus in the Lomagundi district of Mashonaland.

The geological formation consists of a somewhat prominent ironstone range of hills, with a schistose formation parallel and in close proximity; to the north are the well-known limestone hills, while to the south granite is not far distant. The gold occurs in irregular mineralised bands, which open out into lenzes of a considerable width, the richest portion being mostly in the footwall section of the banded ironstone. These lenzes vary from 6ft. to 32ft. in thickness. Timber for both mining and fuel purposes will be cheap and abundant for some years to come, pending which period it is anticipated that satisfactory arrangements to connect with the present rail-head will be arrived at. The entire gold bearing length of the property exceeds five miles, but preliminary development has for the present been confined to three blocks of claims, which are considered to be in a sufficiently advanced stage of development to warrant the ordering of a mill as soon as current experiments on treatment have determined the most suitable type of reduction plant. The ore reserves now stand at a grand total of 176,000 tons, besides a very considerable tonnage of ore partially developed. Mr. Piper advises the erection in the first instance of a plant capable of dealing with 10,000 tons monthly, treating ore in such proportions from the two blocks as to yield 33s. 6d. per ton gross. On this basis, extracting 90 per cent. of the gold and calculating the working cost at 18s. 6d., he estimates a profit of 11s. 8d. per ton, equal to £5,800 monthly, or, say, £70,000 per annum, and he considers that the sum of £150,000, which has been provided, should be sufficient to equip the mine and erect the necessary plant on the basis mentioned. Prospecting and developing will be carried on by the Gold Fields Rhodesian Development Company or other parties on terms on the remaining blocks of claims covering the extensive area owned by the company, with a view to their flotation as independent concerns in due course, whilst it is intended to have one central mill conveniently situated to serve, if possible, the whole of the property. The three blocks of claims under development constitute the nucleus of about 70 claims, the exploitation of which, after the crushing stage has been reached, is estimated by Mr. Piper conservatively to return approximately 15 per cent. in dividends on the whole of the present issued capital. The prospects of the company as a proprietary concern are, therefore, obviously not limited to the revenue derivable from working these 70 claims, but include its proprietary interest in the balance of approximately, 400 claims, and therefore the profits as vendors from future flotations, in the event of the ground hitherto only partly explored proving payable, as to which indications are favourable, may turn out to be considerable.

A REVIEW OF MINING IN RHODESIA.

Gold and Diamonds—Prospects of Chromite, Coal and Asbestos.

In a special article on mining in Rhodesia, a Rhodesian correspondent of the London "Times" says:—"To the mere onlooker it might perhaps appear that the outstanding feature of the Rhodesian mining industry during the past year was the declaration of the highest output on record, combined with the fact that the amount paid in dividends showed an advance even greater in proportion than the increase of yield. This, in the case of gold, was nearly £100,000, and in the case of other mineral products almost exactly £20,000. Not only therefore was the slight decrease of the preceding year made up, but the previous highest recorded figures, of 1909, were considerably exceeded, as the following statement will show:—Gold Output.—1909, £2,623,708; 1910, £2,568,198 1911, £2,647,895. Other Minerals.—1909, £184,414; 1910, £222,929; 1911, £242,864. As regards profits, it is, of course, impossible to estimate those earned by individual mine-owners or tributors and small syndicates, which must often be very considerable, but the declarations of the various companies engaged in actual mining or in financing development work give a good index to the situation. The Globe and Phoenix leads the way with a distribution of 160 per cent., equal to £320,000, earned entirely from mining operations, while among the big development companies the Rhodesia Exploration and Development Company easily heads the list with a 10 per cent. distribution, equal to £151,000. Other big returns were those of the Giant Mines, £103,896, and of the Eldorado, £90,000, and both these companies have now paid back more than the amount of their issued capitals to their shareholders. The total sum distributed by the various companies amounted, according to the latest information available, to over £951,000, an increase of something like £70,000 over 1910, as against an increase in the value of the minerals won of just under £100,000." In regard to diamonds the article says: "In consequence of the recent House of Lords decision confirming the De Beers Company's monopoly, there is likely to be very little prospecting for gems in future, as although it is true that a reward of £2,500 is offered for a payable 'pipe,' the ordinary prospector much prefers to look for something which offers possibilities of a less limited recompense. In commenting on the De Beers case, English papers have constantly asserted that no diamonds have been found in Rhodesia, or if such a sweeping assertion has not been made, it has, as a rule, been confidently stated that no true mine or 'pipe' is known to exist. Even the latter statement is quite incorrect, as several 'pipes' have been discovered, and the Colossus Mine, near the Bembezi River is actually the largest one ye. found in South Africa. It has produced a certain number of good quality diamonds, but the grade is evidently far too low to be payable. There is a recorded production from the Somabula gravels of over £30,000 worth of diamonds, besides other gems valued at over £8,000, and there can be no doubt that the quantity actually produced has been considerably in excess of the official estimate. Against the poor prospect for precious stones, there can be offset the discovery during the year of another important mineral product—tin. This has been located at several places, notably at Enterprise, Abercorn, and Victoria. The deposits in the last-named district appear to be developing well, and though no production is recorded for 1911, some ore is sure to be exported during the present year. Tungsten ores, of which the prospects at one time looked hopeful, were only exported to the extent of 2¼ tons, valued at £167, and thought this is better than 1910, when nothing was produced, there are no deposits of wolfram or scheelite at present under development. Silver-lead ores show a slight decrease, but this is not of much significance, as they are in the nature of by-products of the gold industry, and are nowhere mined for alone. The output of silver was 187,730 ozs., as against 217,632 ozs., for 1910, and that of lead 638¾ tons, as against 718¾ tons in 1910. The principal mineral products of the immediate future are likely to be chromite, coal and asbestos. The last-named is somewhat under a cloud at present owing to the great distance from the railway of the extensive deposit opened up near Victoria, but the quality is excellent, and the Victoria Railway should, before long, much improve matters. Chromite shipments have shown considerable expansion, and the formation of a chrome trust during the year should help to improve prices. The output was 52,363 tons, as against 44,000 tons in 1910. As regards coal, Wankie Colliery is still the only producer, and efforts to find deposits of good quality more suitably situated for the supply of the midland districts and Mashonaland have been a failure. The output for the year was 212,529, as compared with 10,068 tons during 1910, and an even greater expansion should take place this year. The Wankie Company paid 12½ per cent. in dividends during 1911, as compared with 10 per cent., its first distribution, for 1910, and its prospects must be regarded as excellent."

Bucks Reef Gold Mines.

It having come to the knowledge of the board that rumours are current in London regarding an alleged rich strike on the mine, enquiries were telegraphed to the company's manager, who replied on the 16th April as follows: "Nothing new to communicate; development turning out badly, the grade to the mill falling off."

The following are particulars of last month's output from the Bucks Reef mine: Tons crushed, 828; yield, £2,423 2s. 10d.; profit, £221 0s. 8d.

The Jumbo.

In reply to inquiries regarding this Mashonaland mine, Mr. Piper cables that developments show no prospects of improvement and no hope for the mine at depth. He recommends that prospecting development be discontinued, which will save about £600 per month. On a conservative estimate there are twenty-nine thousand tons of ore available. The output for the six months ending with January averaged about three thousand four hundred tons per month, but the mill needs repairs. Mr. Piper says that a smaller output must be expected from the month of April on, and that the mill will run a year. The reef has never been lost, but is not payable at depth. The company has made arrangements for crushing ore from the neighbouring Commonwealth property on tributing terms. The capital of the Jumbo Gold Mining Company is £380,000 in shares of £1, of which 350,000 are issued. At the date of the last reports (July 31, 1911) the Mayo Development Company held 21,891 Jumbo shares and the United Rhodesia Gold Fields 33,678 Jumbos. There are £18,000 of 6 per cent. first mortgage debentures outstanding, repayable at 115 at December 31, 1912, and held by the United Rhodesia Gold Fields.

INVESTORS' DIARY.

The following company meetings have been announced:—

April 25.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep; Cloverfield (Extraordinary General Meetings).

April 30.—New Era; Springs Mines; Brakpan Mines; Transvaal Coal Trust.

May 2.—Meyer and Charlton; New Goch; Roodepoort United; West Rand Consolidated.

May 3.—Cinderella Consolidated; Aurora West; Rand Collieries; New Steyn Estate; Sacke Estates.

May 8.—Roberts Victor Diamonds.

May 10.—Ferreira Deep; Ferreira G.M.; Knight Central.

May 17.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep (Extraordinary General Meetings).

May 18.—Aurora West.

May 22.—Apex Mines; New Kleinfontein.

May 23.—Benoni Consolidated; Crown Mines; National Bank (at Pretoria).

May 29.—Robinson G.M. Co.; New Rietfontein; Ginsberg: New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.

May 30.—Village Deep.

June 4.—Ferreira G.M.

June 5.—Rand Mines.

June 21.—New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.: New Unified; Van Ryn Deep; Government Areas; Glencairn.

June 26.—Transvaal Consolidated Lands.

July 19.—Transvaal Consolidated Lands.

ANSWERS TO CORRESPONDENTS.

"Hammer."—Held over.

"S. of M."—Next week.

"Tin."—The particulars are given in this issue.

"Bolus."—The New Bischoff is in liquidation.

THE WEEK IN THE SHAREMARKET.

Firm, Without Much Business—Rhodesian Stocks Active in London.

Despite very little demand for any stocks, there has been a notable firming up in prices during the week. Labour is still coming in well and prospects are by no means gloomy, but there is little disposition to do business. Tin stocks remain quiet, and the promised new flotations have not yet come on the market. The local public holds little stock of any kind, and a lead from London would find the local market very responsive.

* * * *

According to London advices, in the Rhodesian section the outstanding feature has been the strength of Chartereds. Large blocks of shares have been purchased of late by big interests. Holders of the option certificates (which are in issue to the extent of nearly 1,000,000) will have to declare whether they are going to exercise their options or not by 1st June. As the call is at par, it is to be presumed that the great majority of the shares will be called, which will mean that the capital of the company will be increased to approximately £9,000,000. Of course, the British South Africa Company will benefit by the additional cash thus provided, but the ultimate effect of the transaction has still to be gauged. In general, the Rhodesia market has been steady, with some firmness in individual instances. Willoughbys continue to be absorbed on the excellent developments that are proceeding on some of this company's subsidiaries. Of the gold shares, Globes have been prominent. Cam and Motors are also being purchased, and there is an enquiry for Giants, but Jumbos have fallen back on a pessimistic cable from Mr. Piper, who practically advises abandonment of the mine.

* * * *

	Friday, 12th.	Sat., 13th.	Monday, 15th.	Tuesday, 16th.	Wed., 17th.	Thurs. 18th.
African Farms ...	17 0B	17 0	16 9B	16 9B	16 9	16 0
Adair-Usher Process	1 6S	..	1 6S	...	1 6S	1 6S
Aurora West ...	7 6B	7 6B	7 6B	7 6B	...	7 6B
Apex Mines ...	..	27 6B	...	40 0B	...	...
Bantjes Consolidated	24 6B	24 9	24 3B	24 3B	24 3B	21 9
Benonis	6 0B	5 6B	6 3	6 1	5 6	6 0
Bushveld Tins ...	0 10B	0 11B	1 0B	1 3	1 3	1 3
Brakpan Mines ...	61 6B	62 0	61 0B	62 6B	62 6B	62 6B
City and Suburban ...	51 6B	51 0	50 6B	51 0B	50 6B	51 0B
City Deeps	55 0S	53 6B	53 9B	54 0B	55 3B	56 6
Cloverfield Mines ...	5 3B	5 0	4 9B	4 9B	4 9B	4 11B
Cons. Langlaagtes ...	22 9	22 6	22 9B	22 3B	22 0B	22 6
Cons. Main Reefs ...	19 3	18 9B	18 6B	18 9	19 0B	19 3B
Clydesdales	10 0B	10 0B	10 0B	10 0B	10 0B	10 0B
Cinderella Cons. ...	...	...	...	..	...	22 0B
Coronation Freeholds	0 6B	0 6B	0 6B	0 7B	0 7B	0 8
Con. Investment ...	23 0B	...	22 6B	22 6B	22 6B	...
Concrete Cons. ...	...	...	...	...	10 0B	11 0B
East Rand Cent. ...	8 3B	8 0B	8 3B	8 3B	8 3B	8 4
East Rand Coals ...	2 1B	2 4B	2 4B	2 5	..	2 5B
East Rand Deeps ...	...	2 4B	...	..	2 4	2 6B
East Rand Props. ..	63 0B	63 0B	64 0	64 0B	64 3	64 9
East Rand Deb. ...	..	£95	...	£94	£95	£95
Eastern Gold Mines	2 0B	2 0B	2 0B	2 0B	2 0B	2 0B
Govt. Areas... ...	24 9B	24 6B	24 6B	24 9B	25 0	25 0
Glencoe (Natal) Colls	..	6 3	6 0B	6 0B	...	6 0B
Glynn's Lydenburgs	27 6B	...	27 6B	30 0B	...	29 0B
Glencairns	...	..	4 0B	5 0S	5 0S	4 0B
Ginsbergs	30 0B	30 0B	30 0B	...	...	..
Jumpers	9 0B	..	9 0B	...	...	...
Jupiters	...	11 3B	11 6	11 3B	12 0B	11 9B
Kaalfontein Diamonds	0 8B	...	0 9	0 8B	0 7B	0 8B
Klerksdorp Props. ...	3 3B	3 3B	3 3B	3 4	3 2B	3 3B
Knight Central ...	15 0B	14 9B	14 6B	11 9B	14 6B	14 6B
Lace Props.	...	3 9S	3 9S	3 4	3 3B	3 3B
Lydenburg Gold Farms	8 10	8 8B	8 10B	9 0B	9 0B	9 3
Main Reef Wests ...	29 0B	30 0S	28 9B	28 6	27 6B	28 6
M.R. West Deben ..	£99	£99	£99	£100	£100	£100

B Buyers. S Sellers.

	Friday, 12th.	Sat., 13th	Monday, 15th.	Tuesday, 16th.	Wed., 17th.	Thurs. 18th.
Modder B's	55 0B	...	56 3B	56 6	56 0B	53 0B
Midas Deeps ...	1 0	1 2S	1 2S	..	0 10	0 10B
Middelvlei Estates ..	2 0B	2 0B	2 0B	2 1	2 0B	2 0B
Modder Deeps ...	26 3B	28 0B	29 6B	30 0S	30 6B	30 0B
Meyer and Charltons	...	55 0B	...	...	...	...
Natal Nav. Colls ...	16 0B	16 0B	16 6B	16 6B	16 6B	...
New Eras	7 4	7 3	7 3B	7 3B	7 3	7 3B
New Kleinfonteins ..	30 9B	30 6B	30 9B	31 0	...	30 0B
New Rietfonteins ...	11 0	10 9B	...	10 6B	10 9	10 6B
New Unifieds ...	16 0B	16 0B	17 0B	17 0B	17 0B	17 0B
New Boksburgs ...	1 9	1 6B	1 6B	1 6B	1 6B	1 6B
Nigels	16 0B	...	16 0B	...	15 0B	...
Orange Diamonds ..	1 11B	1 10B	1 9B	1 9B	1 9B	1 9B
Pretoria Cement Co	52 6	52 6B	53 6	52 6B	53 6B	54 0
Potchefstroom Est....	...	...	1 6B	...	...	1 6B
Paardekraal Estates	...	1 0S	0 9B	1 0S	1 0S	1 0S
Premiers Deferred	...	185 0B	182 6B	..	...	...
Premiers Preferred	..	170 0B	170 0B	...	...	...
Rand Nucleus ...	3 0B	3 0B	3 1B	3 0B	3 0B	3 3B
Randfontein Estates	31 6	30 9	30 6B	29 9	30 3	30 9
Randfontein Deeps ..	3 0B	3 6	3 3B	...	3 3B	3 6
Rooiberg Minerals .	31 6	32 0	32 6	33 3	33 6	33 3
Rand Collieries ..	...	...	7 0B	7 0B	...	...
Rand Klips	5 8B	5 6B	5 7	5 7	5 7B	5 6B
Ryan Nigels ..	4 0B	4 0B	4 0B	4 0B	4 0B	4 0B
Rood. Durban Deeps	...	...	25 0B	26 2S	...	...
Rood. U.M.R. ...	20 0S	...	...	...	..	–
Salisburys	2 6B	..	2 6B	2 6B	..	2 6B
Simmer Deeps ...	1 0B	4 0B	4 0B	1 0B	4 0B	1 0B
South African Lands	4 8B	4 6B	4 6B	4 7B	4 6B	4 6B
S. Randfontein Deeps	4 0	3 9B	3 9B	3 6B	3 7B	3 8B
Sub Nigels	6 0B	6 0B	6 0B	6 0B	6 0B	6 0B
S. A. Breweries ...	39 0S	39 0B	39 0B	39 0B	39 0B	39 0B
Springs Mines ...	12 3	12 4B	12 6B	12 6B	13 3B	13 3B
Trans. G.M. Estates	44 0B	45 6S	44 0B	44 0B	44 0B	...
Temple Tins	2 10B	2 10B	3 0S	...	3 0S	2 10
Trans. Coal Trusts...	39 6B	38 0B	39 9B	40 6	40 6B	42 3B
Tudors	2 0S	...	2 0S	2 0S	...	2 0S
Trans. Cons. Lands	...	34 6B	34 6B	...	...	...
Van Ryn Deeps ...	8 0B	8 0	8 0	8 0B	8 0B	...
Village Deeps ...	43 9B	43 9S	43 6S	...	43 6	43 0B
Vogel. Cons. Deeps...	...	1 9S	1 6S	...	...	...
Witwatersrands ...	60 0S	60 0S	58 0B	60 0S	56 6B	57 6B
Wolhuters	22 9	22 6B	...	22 9B	23 0S	22 6B
Witbank Collieries...	...	42 0B	41 3B	43 0B	42 6B	42 6B
Wit. Deeps	55 6S	...	...	55 6S	...	...
West Rand Est. ...	...	...	2 9B	...	3 0B	...
Zaaiplaats	43 6	41 0B	42 0B	40 0B	41 0	41 0B

B Buyers. S Sellers.

Making Gold.

Further statements having appeared purporting to publish an alleged favourable report by Sir William Ramsay on a supposed process for making gold, he considers it necessary to give some details of the experiment. In a letter to "The Times," Sir William states that late in December of last year General Marquis Courtes called on him with a personal letter of introduction from M. Cambon, the French Ambassador. He explained that he was one of the possessors of a secret process for making gold artificially; and he brought with him a Monsieur Verley to explain this process. "On hearing the explanation it appeared to me," proceeds Sir William Ramsay, "that it might be worth while to try the plan, for it was not scientifically impossible. Accordingly, it was arranged that M. Verley should demonstrate the process to me, and this was done. I insisted frequently that I was taking no precautions against fraud, because I should myself try the process later, after M. Verley had left London. The result, as found by Messrs. Johnson and Matthey, was that the solid left me by M. Verley contained 40 grains of platinum per ton, no gold, and merely a trace of silver. I sent this result to M. Verley, who has thought fit to make use of it. Six experiments, in which M. Verley's instructions were accurately followed by me, show that in no case is a trace of gold, silver, or platinum formed. I have written to the Marquis Courtes informing him of these negative results, and I understand that he has dissociated himself from the enterprise."

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiencesof Readers.

Efficiency and Education.

To the Editor, *South African Mining Journal.*

Sir,—I have read " Airblast's " letter, published in your issue of 13th inst., with great interest, and feel sure that it will commend itself to all practical miners. My experience, not only in this country, but in Australia and the United States, has convinced me that there is no finer or more reliable type of employee than the man whose knowledge has been gained by actual work, backed with the sound training in theory and science given by a course of correspondence tuition. This plan approaches the ideal, as the student is applying the subjects of his instruction to his daily work. It is common knowledge that many of our most prominent and capable mine managers qualified in this way, and the comparison between a man of this stamp and the ordinary School of Mines diploma holder is simply ludicrous. It is perfectly obvious that the man whose knowledge of theory is founded on a series of lectures cannot equal that obtained by quiet systematic study, which made him think for himself instead of learning parrot fashion. A lot of money has been squandered in bolstering up the School of Mines. If you want to know what 90 per cent. of the graduates are worth, ask the mine captains on the Reef—they know. One of these days the facts will be plain enough, and it is nearly time that shareholders began to take steps to ensure that their profits were safeguarded by the employment of proved men of practical experience. In no industry is there greater need for efficiency, and a man's success in the mines should depend only upon his ability to do the work better than others, regardless of his possession or otherwise of a School of Mines diploma.—Yours, etc.,

" OLD HAND."

Capetown, April 15.

A Plea for the Man-Engine.

To the Editor, *South African Mining Journal.*

Dear Sir,—With the exhaustion of the outcrop mines the Rand is now entering on what might almost be termed a sphere of new activity. By far the greater bulk of Rand ore is now drawn to surface from a depth of over 1,000 feet, and it is safe to assume that the average stoping depth of the mines will increase rapidly during the next few years. Within the next half a decade all the outcrop sections of the Central Witwatersrand down to a depth of about 1,000 feet will be absolutely worked out. The Rand is clearly entering on a stage of very deep working. It may be asked, with reason, have those in control of the industry adequately recognised this? Have they made proper provision for mining the gold-bearing banket at great depths on a scale commensurate with the vast sums of capital sunk in the Witwatersrand's deeper levels? I speak with some authority when I say that, whilst in some respects adequate provision has been made, in others the exigencies of the case have been woefully neglected. One of the great problems to be faced in the working of the deeper levels is the hoisting and raising of the large skilled and unskilled labour forces requisite in a mine sending, say, a million tons of rock per annum to surface. Think what it means to send down and raise again, say, 3,500 natives and 300 white men to a depth of two or three thousand feet every day. No one who has not worked underground can realise the amount of time wasted at pit-head and the various shaft stations in waiting for descending or ascending cages. The white employees naturally seize the first opportunities of getting to or from their work, and the natives have to exercise patience, and wait a weary wait, for their turns. One of the things that has made natives prefer working in outcrop mines to deep levels has been that after the boy has finished his hole he can walk up to grass and indulge his idle self in the compound or eating house for the rest of the day. In a deep level mine the climb up is too great and exerting, and consequently the native has wearily to await his turn, and naturally therefore shuns deep levels. There can be no doubt that this has unfavourably affected the native labour complements of many of our deeper level mines, and it is going to prove a factor of greater importance in the near future. How is this state of affairs to be remedied? Rand shafts, methinks, have already attained to a maximum of size and expense. Two additional man-hoisting compartments might solve the difficulty, but they would impose a heavy burden on the mine in the shape of capital and running charges. Why not resort to that antiquated device, the man-engine? I suppose I shall be taxed with being an advocate of Methusalan methods, and shall be told that such devices belonged to the days of several generations ago. But why should not the man-engine prove of service here? This is a modern field, and we would naturally have a modern man-engine with a steel beam instead of an immense wooden baulk, and four platforms instead of one. Such a device should not take up very much room, and the numbers of natives it could raise and lower in a comparatively short space of time would be very large. White men and tools would be hoisted and lowered in skips and cages in the compartments set apart for these purposes. Thus congestion in the hoisting ways would greatly be relieved. Present-day mining policy favours concentration of operations in and around large shafts and along main haulage levels. Why should not a central man-engine shaft from which main haulage levels, with underground electric locomotives and small coaches carrying natives to distant working places, serve a group of deeper level mines? I plead that there are sensible grounds for considering the application of a modern man-engine to modern mining methods on the Rand. I have known of boys going on shift at four in the morning and not coming up to surface until eight at night, largely on account of protracted waits for cages. Man-engines have been in use for years in Cornwall and the Isle of Man, and I wonder that the possibility of such a device rendering service on the Rand has not been considered.—I am, yours, etc.,

" FOXDALE."

Johannesburg, April 17.

The Geology of the Rand.

To the Editor, *South African Mining Journal.*

Sir,—The paragraph which appealed to me most in Mr. Bleloch's contribution to the edifying discussion which took place in the Geological Society, published in your last issue, on green quartzites, striped shales, speckled shales, basement shales (?), lateral dykes, up-throws, down-throws, duplications, and other uneconomic matters, is, where he says, " in his opinion, many of the conceptions of great faulting, duplications, inversion of the beds, etc., are unnecessary," and I should like to add—when too frequently applied, faulty geology! Rand stratigraphy, which, I take it, they are all struggling with, is a very simple branch of geology when you know it, but it can never be learnt on the Witwatersrand only, by the cleverest geologist on earth. Each district, such as Hex River, Heidelberg, Klerksdorp, Free State, etc., has certain series of reefs of this age, better developed, and better exposed, than it is possible to find here. The best sections on the Rand are from Elsburg up to Main Reef series; but for the rest, such as Blue Sky, Van Ryn, Du Preez's, one must travel far and wide, with open eyes, and open mind, untrammelled by the theories of those geologists who had the temerity to write books on the country generally after being here for only two or three years, in that veni, vidi, vici tone, that they have been accepted as gospel ever since, except by your humble servant, who thinks he can think for himself without their aid, and prefers to study the tablets of Nature's books on the five, five-mile thick, geological ages which, from time to time, she dumped down on the granites of South Africa, concealing pots of diamonds in them all. Mr. Bleloch is, unfortunately, wrong in his correlation of Langerman's Kop with Du Preez's, simply because he finds buckshot pyrites in the leaders above what at the Van Ryn they please to call "Main Reef," lying on pipeclay and shale—of all footwalls for that well-known pebble bed! He cannot point to a payable reef lying on pipeclay and shale in the Du Preez's like unto the nethermost reef of the Van Ryn series—which by the way contains the rich and famous "Chimes Reef," the extension of which the Van Ryn G.M. Co. is now developing. In tight stratigraphy Du Preez's series is never less than 500 yards from the Van Ryn, but where the fanning-out of country has taken place then it can be any distance. It is a geologist's first business to study each series thoroughly, and to be able to recognise them, or fragments thereof, wherever he comes across them. How they became misplaced—from our microbean point of view—is Nature's business, and all the theorising in creation cannot alter their position, therefore it is better to accept the facts, and have done with it, rather than argue over such trivialities, and lose sight of the economic aspect, which more nearly appeals to the public. Dr. Mellor's theory of the thinning out of the beds, westward, to make them pass round, or through, the imaginary Witpoortje break, is not what I have observed traversing them, times out of number, for the last quarter of a century, but just the reverse! The fanning-out of country (a Spanish idea) is really what has taken place, as he will find before long, in his search for Main Reef in the Black Reef beds of Randfontein. Of Dr. Mellor's other misreadings, I have already written you, and time will prove who's right.—Yours, etc.,

SCOTT ALEXANDER,
"Rand Stratigraphist."

Johannesburg, April 16.

MINING MEN AND MATTERS.

Professor Yates, with a party of mining men attending the Mining Institute, were guests at Brakpan Mines, Ltd., last Saturday, and inspected the property, both on surface and underground.

* * * *

Sir Julius Wernher has cabled instructions to Johannesburg that a bonus of £100,000 from himself should be distributed among the members of the staff of Ecksteins as an appreciation of their loyal services.

* * * *

It is notified that the Minister of Mines has been pleased to appoint the following gentlemen to be additional members of the Phthisis Prevention Committee: Dr. Andrew Hutton Watt, Dr. Archibald McArthur Johnston, and Mr. William Morgan.

* * * *

Mr. C. D. Leslie, Superintending Engineer in the Transvaal of the Consolidated Gold Fields of South Africa, is leaving Johannesburg shortly for a well-earned holiday in Europe. During his absence Mr. J. W. Craig, Assistant Superintending Engineer, will assume Mr. Leslie's duties.

* * * *

In view of certain rumours that Mr. H. H. Webb, of the Consolidated Gold Fields, might be a passenger on the ill-fated "Titanic," we are glad to be able to state that a letter received by us from him this week makes it clear that on the 14th March he was still in New York, and therefore very unlikely to be crossing in that direction last week.

* * * *

At the monthly meeting of the Geological Society, held at the Chamber of Mines, on Monday, Messrs. T. Nettleton, B. Lightfoot, G. F. Dickson, and N. E. Bertier were elected members. The following papers were read:—"On an Interesting Dyke Intrusion in the Upper Waterberg System," by Mr. P. A. Wagner, D.Eng., B.Sc., M.E., and "The Nama System in the Cape Province," by Mr. A. W. Rogers, D.Sc.

* * * *

Mr. Walter McDermott received at the hands of the Institute of Mining and Metallurgy, at its recent meeting, the highest honour which the Institution is able to confer, in the shape of the gold medal of the Institution This was in recognition of his services in connection with the equipment of the Bessemer Laboratory of the Royal School of Mines and as the representative of the Institution on the Board of Governors of the Imperial College of Science and Technology during the period of its establishment and organisation, and to signalise his services in the advancement of metallurgical practice. The services which Mr. McDermott has rendered in these connections are so well known that it is not necessary to dilate upon them. Suffice it to say, the gold medal of the Institution has never been more worthily awarded. Sir Julius Wernher had a similar honour conferred upon him "in recognition of his great personal services in the advancement of technological education and in the promotion of the highest interests of the mining and metallurgical professions."

* * * *

The ordinary general meeting of the Chemical, Metallurgical and Mining Society will be held in the lecture theatre, South African School of Mines, Eloff Street, this (Saturday) evening, at 7.45. A note will be submitted by Mr. James Gray, F.I.C., on "Coal from the Wankie Colliery, Southern Rhodesia." Mr. Edward H. Croghan has forwarded for reading a note on the "Determination of Carbon Dioxide." The chemical papers for reading are "The Action of Mineral Sulphates and Arsenates on Cyanide Solutions," by Mr. Andrew F. Crosse, and that for discussion "The Luminator Purification of Water for Steam Boilers," by Mr. William Cullen (Past President); the mining paper for final discussion is "Accidents in Transvaal Mines; with Special Reference to Falls of Ground," by Mr. A. Chilton—a contribution has been promised to the discussion of his paper by Mr. E. J. Laschinger—and that for continued discussion: "Some Observations on Ancient Mine Workings in the Transvaal," by Mr. T. G. Trevor, A.R.S.M., Acting Inspector of Mines, Pretoria. (A contribution to the discussion on this paper will be read from Mr. T. Lane Carter.) Metallurgical paper: Reply to discussion, "Practical Applications of the Specific Gravity or Moisture Flask," by Mr. H. Stadler. Final discussion: "Notes on Absorption of Gold by Amalgamated Copper Plates, Cast Iron Retorts and Amalgam Trays," by Prof. G. H. Stanley, A.R.S.M., F.I.C., and Mr. M. T. Murray, M.Sc. (Mr. A. Whitby will contribute to the discussion on this paper.) Continued discussion: "Zinc Dust Tests," by Dr. W. J. Sharwood, A.R.S.M., M.I.M.M.

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Electrical Notes.

ENGINEERING PROGRESS SEEN IN ELECTRICAL INNOVATIONS.

"Wireless"—The Petrol Engine—Electrical Innovations.

[By J. W. KIRKLAND, Member of Council of S.A. Society of Electrical Engineers.]

I was so fortunate on my recent trip not only to spend some time in England, but to have a few days in Berlin and a month in America, and during this time I was of course able to imbibe some ideas of recent progress and changes. Among other things which impressed me at home was the tremendously important place in civilisation which has been taken by the wireless telegraph, about which we have just heard some discussion. One does not get out of touch with wireless telegraphy at any point of one's travels. Even on the ship going home there was a Belgian engineer—I think his name was Rosenthal—who had just come from the Congo State, where he had been engaged in installing a number of isolated wireless stations. To my way of thinking, the other great engineering event of this century is not electrical; it is the petrol engine. Its development marks one of the most important phases of engineering and scientific progress the world has ever seen. It gave us the ubiquitous motor car, and, more recently, has achieved the conquest of the air. That, however, is not within the scope of my remarks this evening. Soon after my arrival in London the Electrical Exhibition at Olympià was opened, and I spent a very interesting day there. There was an example of the Diesel Engine of 150 h.p. It was set up and running in the exhibition under varying loads and it was a pleasing example of good design and mechanical construction, as far as one could judge by its appearance and the smoothness of its operations. The Diesel engine seems rapidly to become a serious competitor of the steam turbine in the smaller sizes. It appears to be the practice of most manufacturers of these engines to limit the power per cylinder to about 100 to 150 h.p., so that one cannot see any great extension of the power of the engines. On the contrary, as regards steam turbines the capacity of units is increasing greatly. In Berlin I saw in the works of the A.E.G., castings for a 20,000 kilowatt horizontal Curtis steam turbine; and again when I crossed to America I saw the partially completed elements of a machine also of 20,000 kilowatts, of the vertical Curtis type. One of the same size was started on the day I sailed back to England. A rather regrettable feature in connection with engineering development which I noted is the unsatisfactory progress of gas engines. Gas engines promised a few years ago to give the turbines a hard run for their money, but they have not fulfilled all expectations. I do not mean that there are not a number of gas engine electric plants in successful operation, but merely that they are not achieving the great success which their promoters expected of them. To return to the Olympia Show. There was an example of a homo-polar generator, which I looked at with interest on account of the paper we had before us last year by Mr. Grote and Mr. Davidson. This homo-polar generator was built on well-known principles of design, but an interesting thing about the collector rings was that they were served by brushes consisting of garter springs of some kind of white metal. This was one of the principal claims of the inventors of the machine. Elliott Brothers showed a gyroscopic compass which points to the true North. It is operated by a small electric motor at high speed, and it is claimed to be correct within 60 degrees North and 60 degrees South Latitude. It is evident that the nearer one gets to the poles the less directive force there can be on a gyroscope owing to the earth's revolution. Of course the magnetic compass also becomes almost useless as one goes further North, owing to the magnetic poles not corresponding with the geographical poles. All places at home show the effect of the cheapening of electric light by metal filament lamps. The sudden cutting down of the watts per candle power by 70 per cent. it was thought might have the effect of putting a good many central stations out of business. That has not been the case. People have been accustomed to demand more light and what was at one time considered to be brilliant illumination is now considered to be dim shade. With the impetus which has been given to electric lighting by increased lamp economy has come the insistent demand for an improved load factor in connection with central stations. Hundreds of active minds are devoting themselves to the work of cultivating and producing demands for electrical energy which do not coincide in point of time with the demand for lighting. It has not been the public that has called for electric heating and cooking, but rather the electric light companies which wish to cheapen their supply and swell their gross income. Crossing the Atlantic I had the pleasure of sitting next to Mr. A. M. Robeson, who had so much to do with mechanical and electrical engineering out here. I sat between Mr. Robeson and Mr. Gano S. Dunn, President of the American Institute of Electrical Engineers, who had just come from the International Electrical Congress at Turin where he had been one of the delegates. Among other things Mr. Dunn told us, as an achievement of this congress, was the universal adoption of the algebraic expression of Ohms' Law, $I = \frac{E}{R}$ Another point discussed and settled at Turin had to do with the direction of rotation of vectors. Hereafter, all *proper* vectors must revolve counter-clockwise. It was gratifying to learn from Mr. Dunn that one effect of this congress and other congresses has been to give to electrical engineering a common language. There is practically a volupuk of electrical engineering. Text books written in Russian will not require translation as to their technical terms or mathematics any more than will, possibly, Chinese, although I am not quite sure about the latter. I found in America a great deal of discussion on something which will one day be of importance here, that is the effect of corona loss as limiting the distances to which power can be transmitted. It was only when voltages of over 100,000 came to be employed on power transmission lines that it was realised that there was a thus far unsurmounted barrier in the way of indefinitely raising the voltage. The corona loss is one which takes place suddenly beyond a certain critical voltage depending on the area of the conductors, upon the altitude, weather conditions, and so forth. The permissible voltage is less at a high altitude than at sea level. Here on the Witwatersrand we are in a less favourable position for high voltage than is the case at the sea coast. Among new applications of electric motors I heard the operation of steam ships discussed a good deal. It seems almost absurd to put electric transmission within the narrow confines of a ship, but there are a great many features which make steam turbines and motor drive very efficient apparatus on ship-board. The unlimited supply of cooling water makes it easy to get high degrees of vacuum. This continues a strong argument in favour of using steam turbines. The weight of a high speed turbine operating, let us say at 2,500 revolutions a minute, is about 8.5 lbs. per horse power, while the weight of slow speed turbines of 325 revolutions per minute, such as are used for driving the Lusitania and Mauretania directly connected to screws, is 42 lbs. per horse power. There is thus a difference between 8½ and 42 per h.p. available in the electrically propelled ship for generators and motors. A 7,500 ton ship is at present being built with this drive. While great economy is not expected there is considerable saving in first cost as compared with other methods of driving and much less room is taken by the turbo-electric system. I went from Chicago to the Calumet and Hecla Mine, Michigan, where they have the deepest shaft in the world—the "Red Jacket." There I saw a Ward-Leonard electrical hoist which, although smaller than some which we have on these fields, is novel in the respect that it is underground. I think that on the Witwatersrand we have not yet put any Ward-Leonard hoists underground. This particular hoist has a motor generator set of about 400 kilowatts, operating at 750 revolutions per minute, with a synchronous motor instead of an induction motor. In that respect the practice differs from what we are accustomed to here. The hoist is a single drum affair, 6 feet diameter drum, 65 revolutions per minute. The motor is direct connected to the drum, and the speed is 1,125 feet a minute on a 20 deg. incline. In the same shaft they have a rather interesting installation of high-lift centrifugal pumps. There are four 8 in. pumps each capable of raising 1,000 U.S. gallons per minute against 800 feet head operated by 300 h.p. slip-ring motors at 1,500 revolutions per minute.

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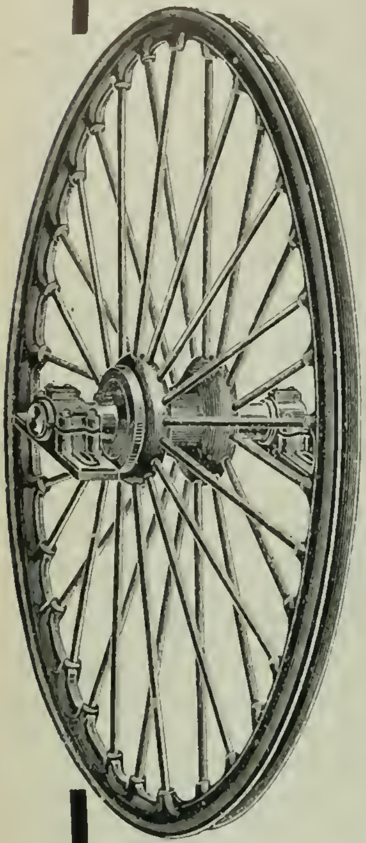

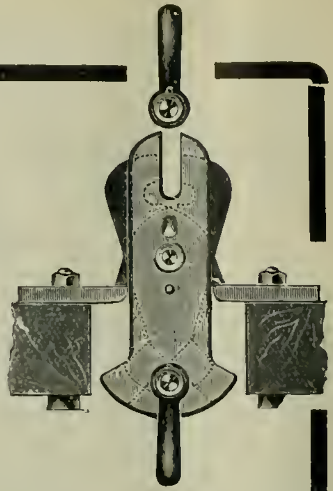

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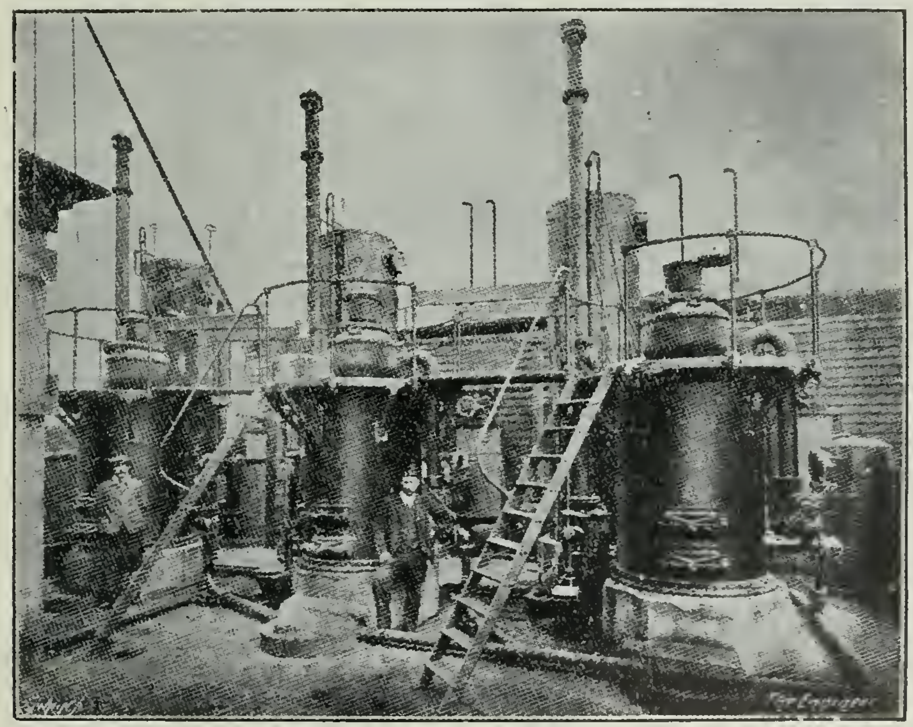
Engineering Notes and News.

A TEMPORARY POWER PLANT FOR TUNNEL DRIVING.*

A Model Suction Gas Producer Plant—Points for South African Municipalities, Railways and Other Power Users.

By the courtesy of Messrs. Walter Scott and Middleton, a long and careful inspection has been made of the temporary power plant which they installed for the purpose of enabling them to drive under the Thames the new footway tunnel, with which the London County Council are connecting North and South Woolwich. The power-house was erected on a part of the roadway immediately in front of the northern entrance to the Free Ferry, and it contains many interesting features. Owing to the very restricted area which it was possible to place at the disposal of the contractors, it became necessary to utilise every inch of the ground, and consequently the power-house had to be specially designed to fit into a small area, and to give the necessary interchange and stand-by plant within that area. Messrs. Hal Williams and Co. were the consulting engineers who designed the plant for Messrs. Walter Scott and Middleton, and supervised its running during the continuance of the contract. The motive power is derived from gas engines working on suction gas, this being, we believe, the first time on record that gas engines have been used to drive a contractor's plant of this importance, the essence of which has been its capacity for continuous running. There are three coupled gas engines, each capable of giving 150 brake horse-power at a speed of 180 revolutions per minute, when working continuously day and night, but with an emergency overload capacity of 20 per cent. for one hour. Each engine has two cylinders, 18in. diameter by 24in. stroke. By this arrangement the power per cylinder was kept small, and the complication of water-cooled pistons was rendered unnecessary. As an additional precaution, each cylinder was fitted with a duplicate magneto. As the three engines had to run in parallel on the main shaft, it was necessary that the cyclical variation should be as slight as possible, and consequently they were specified to govern on the variable admission of constant mixture, so as to give them an impulse every revolution. The fly-wheels were made especially heavy, and were turned to meet the exacting conditions of the belt drive, which is taken off them at a belt speed of over a mile a minute.

The suction gas plants were designed to burn coke or Scotch anthracite containing an appreciable percentage of volatile matter, and are arranged so that each engine can run on its own gas plant, or the plants can be cross-connected, and the engines run in parallel upon them if desired, thus allowing one plant to be cut out at any time for clinkering or for repair. The contract for the gas engines and gas plant was secured by Tangyes Limited, Birmingham, and so well have they responded to the conditions laid down by the designers of the installation that the engines and plants have run throughout the contract without any involuntary stoppages, and have given every satisfaction to the engineers. The fuel consumption on test was, we are informed, 0·727 lb. of Polmaise Scotch anthracite per brake horse-power per hour.



The Gas Producers.

As we have stated, the belt drive from the engines is taken direct from the fly-wheels. They drive a main shaft 5½in. in diameter, running at a speed of 300 revolutions per minute. In order to enable any engine to be cut in or out at will, or to be started up from the main shaft, in the event of the supply of compressed air, from which they are ordinarily started, being exhausted, the drive from each engine is communicated to the main shaft through specially designed clutches mounted on sleeves running in bearings entirely independent of the main shaft. In addition to this the main shaft is divided into three portions connected by claw clutches. The object of this sub-division was to enable any length to be cut out if need be while running, without

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* Reprinted from "The Engineer," January 12, 1912.

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To mark the occasion a SPECIAL ANNIVERSARY ISSUE which will deal with every conceivable aspect of Mining, Metallurgy, Finance, Engineering, Railways, Harbours and Subsidiary Industries throughout the Sub-continent, will be issued in JUNE next.

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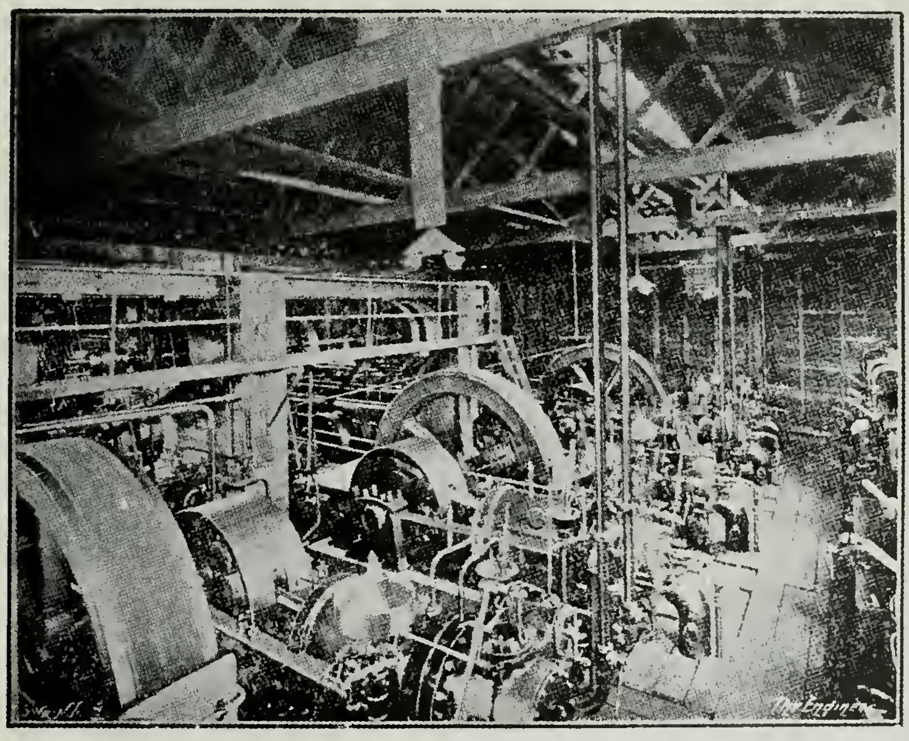
affecting the running of the rest of the plant. In order that the cutting out of one length of shaft should be attended with as little inconvenience as possible, the machines, which are all in duplicate, were arranged in the engine-room so that if one portion of the main shaft had be cut out, the duty could be continued by the machines running off another portion. This provision has proved especially useful at week-ends when work in the tunnel has been stopped, and it has only been necessary to run one dynamo and one air compressor, the rest of the plant being shut down for overhaul or cleaning. The countershaft is also provided with a claw clutch, and is driven from the main shaft by fast and loose pulleys at each end. The machines driven off this countershaft are similarly arranged to provide against stoppage. On account of the high speed, laminated endless belts, by Messrs. Hendry, of Glasgow, have been used for all the drives. The Benn clutch, manufactured by the Unbreakable Pulley Company, Limited, of Manchester, was selected and used on the three main engine drives. The shafting was supplied by the Vaughan Pulley Company, Limited.

All the bearings throughout are provided with ring lubrication, and, as an additional precaution, forced lubrication is fitted to each bearing. By this means any bearing which shows signs of heating can at once be flooded with oil, and the heating overcome. There are four air compressors two high-pressure and two low-pressure. The air from the high-pressure machines is used for grouting and pumping purposes, and the air from the low-pressure machines is used for maintaining the air pressure in the tunnel. The two low-pressure machines were supplied by Alley and Maclellan. They run at a speed of 300 revolutions per minute, and are each capable of compressing 60,000 cubic feet of free air per hour. They run as single-stage machines, but are each capable at small cost of being converted into two-stage machines, compressing to 100 lb. per square inch, the pulleys on the machines being wide enough to take a belt for this duty. Each machine is provided with an aftercooler. The cooling water used in the gas engines and in the air compressors is run into a central sump, from which it is pumped over a cooling tower by centrifugal pumps.

There are four dynamos, each generating current for power and lighting at 220 volts. These were supplied by Ernest Scott and Mountain, Limited, and are arranged so that all four machines can run in parallel, or the two large power machines can be run separately if desired. These large machines are used for supplying power to the electric cranes and for pumping. The hydraulic pumps are used for supplying hydraulic power for actuating the shield used for excavating the tunnel. The plant was set to work on the vertical shaft in July, 1910, and ran continuously until October, when it was shut down for a month, while preparations were being made to start the horizontal under-river portion of the tunnel. It was started on this at the end of November, and has run continuously from that date until it was shut down a short time ago on the completion of the work. At times of heavy air blows in the tunnel, every piece of machinery in the power-house has been simultaneously placed in commission, and has had to run to the limit of its capacity for long periods. We may say that at the time of our visit a heavy call was being made on the compressing plant. Looking out across the river, along the line of the tunnel, the commotion of the surface of the water caused by the escaping air was plainly visible. Yet the pressure in the tunnel was always fully maintained, nor did it once during the course of the work fall below dangerous limits. The elasticity of the design has proved especially useful, and the fact that the whole plant has responded so well to its arduous task is a very great credit to its designers, as well as to the makers of the various machines which comprise it. Not so very long ago it would have been considered distinctly rash to put suction gas engines to drive machinery which it was absolutely essential should always be kept running, but they have since then amply proved their reliability during continuous working in the driving of factories, etc., and in many other directions. The compactness of the arrangement of the plant will be fully appreciated by an examination of the various engravings reproduced. The whole of the running machinery had to be grouped in a space measuring 50ft. by an average of 59ft. 6in. There was not an inch of room to spare, and, as a matter of fact, it was a journey of some little difficulty to get from one side of the engine-house to the other. High-speed belts were everywhere, but these were efficiently guarded, and we understand that no accident of a serious kind occurred during the whole progress of the work.



The Gas Engines.

Mr. J. C. Ferguson has been appointed manager of the Goodrich Tyre Agency (Bartle & Co., Ltd), Loveday House, Johannesburg.

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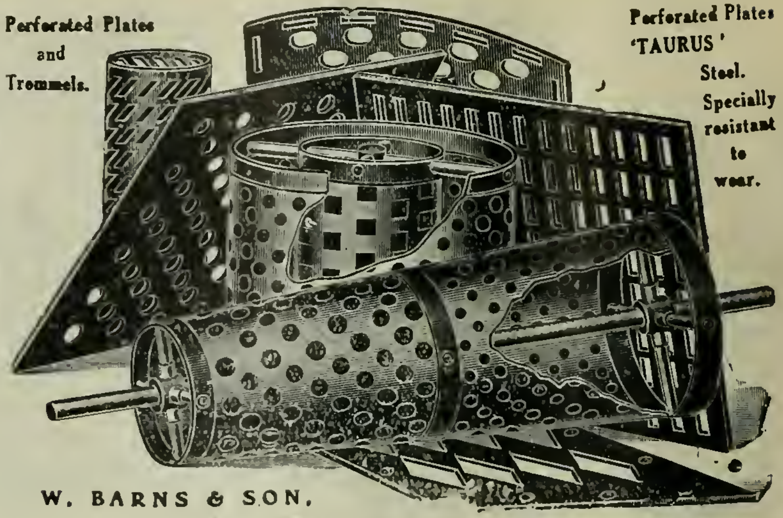

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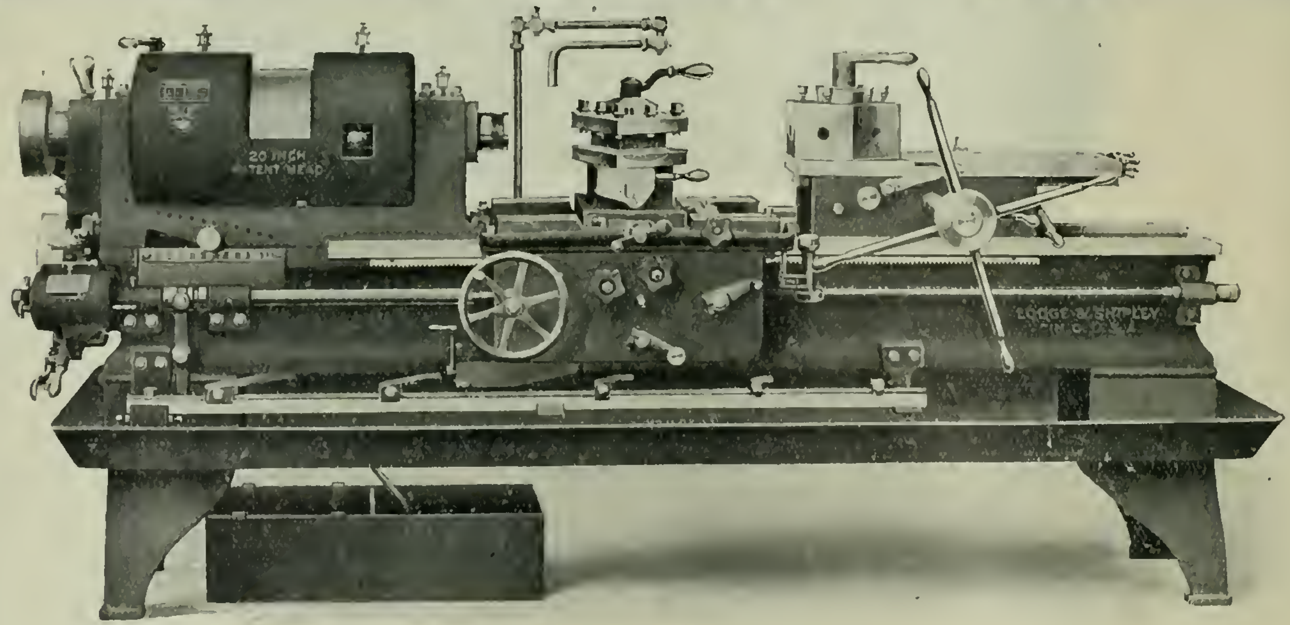

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Finance, Commerce, and Industries.

Standard Bank.

The report of the Standard Bank of South Africa, Ltd., for the last half-year has just been published. The gross profit is £457,500, as compared with £425,000 for the corresponding period of 1910, and makes for the whole twelve months £897,300, as against £805,900. The dividend is unchanged at the rate of 13 per cent. per annum, which was also the rate paid in the first half of the year. In the first half of 1910 the rate was only 12 per cent. per annum, making the distribution for the whole of the year 12½ per cent. The balance carried over is £47,600, as compared with £44,900 a year ago and with £42,100 brought in from the June six months. The appropriations to reserve fund and bank premises account are unaltered at £20,000 each. Deposit, current and other accounts stand in the balance-sheet at £19,142,100, an increase of £1,597,900, whilst advances to customers, etc., figure for £11,865,600, a rise of £1,325,500.

* * * *

Bank of Africa.

The following is the report of the directors of the Bank of Africa for the year ended 31st December last, which was presented at the sixtieth ordinary general meeting of shareholders, held at the Cannon Street Hotel, London, on April 3. The directors submit the report and balance sheet for the year ended December 31 last. After providing for bad and doubtful debts the net profits amount to £74,259 18s. 10d.; add balance from December 31, 1910, £19,368 12s. 1d.—£93,628 10s. 11d., which it is proposed to apply as follows: In addition to the interim dividend of 3s. 9d. per share, less income tax, paid in August last, amounting to £30,000; a further dividend of 3s. 9d. per share, less income tax, £30,000; bonus of 7½d. per share, less income tax, £5,000, making a total distribution for the year of 6½ per cent., less income tax; contribution to pension fund, £4,000; in reduction of bank premises account, £5,000; balance to next account, £19,628 10s. 11d.—£63,628 10s. 11d.—£93,628 10s. 11d. Branches have been opened at Douglas and Uitenhage, Cape Province.

* * * *

New Industry for Maritzburg.

A new company, with the name of the Union Boot Manufacturing Company of South Africa, Ltd., with a capital of £15,000, has been formed for the purpose of establishing a factory in Maritzburg for the manufacture of all classes of footwear. A number of influential local men, who consider this class of industry one of the best paying in the industrial world, are associated with the present enterprise, and they refer to Leicester, Stafford, Bristol and Northampton as evidences of the industrial possibilities of the trade. The promoters of the scheme affirm their belief in there being nothing to stop the city from becoming the centre of boot manufacture for the Union.

* * * *

Union Land Bank.

The following are the purposes for which loans will be issued by the new Land Bank:—(a) Improvements, in which term shall be included farm buildings, fences, tanks and other structures for the dipping or spraying of stock, the clearing of land for cultivation, and the planting of trees, orchards and vineyards. (b) The purchase of stock or plant of all kinds and of agricultural requirements generally. (c) The discharge of existing liabilities on land or, in special circumstances, any other existing liabilities. (d) The payment of costs incidental to the subdivision of land held in undivided shares. (e) The establishment and promotion of agricultural and rural industries including, in addition to other such industries, wool, tobacco, leather, dairy and like industries, and the cultivation, sale and exportation of fruit. (f) The purchase of land for any of the purposes described in paragraphs (a), (b) and (e) of this section by a person or group of persons whose financial resources are deemed adequate to carry on a purpose described in any of those paragraphs, but no advance shall be made by the Board for the purpose of any such irrigation, water storage or boring work as may be made the subject of a loan under any law relating to irrigation or conservation of water. No advance will be made of less than £50, or more than £2,000, except in the case of large agricultural works approved by Government. Advances will be made repayable over 30 years.

* * * *

A Bank Comparison.

The amalgamation of the National Bank with the Bank of Africa naturally calls attention to a comparison of the standing of the two institutions with the Standard. The Standard Bank has a paid-up capital of £1,548,525, as compared with £2,350,000 of the National and Bank of Africa. There is no uncalled liability on the latter shares, while the Standard Bank has £4,645,575 uncalled. The reserve now amounts to £1,960,000, while the reserve of the National and Bank of Africa will reach £370,000. The Standard deposits now exceed £19,000,000, as compared with £17,500,000 of the other two institutions, so that it will be seen the Standard Bank still remains the largest institution in the Union. One other point of difference may be mentioned, and that is that the management of the National Bank is at Pretoria, while the management of the Standard Bank is in London. A brief comparison of institutions is given herewith:—

	Standard.	National.
Paid-up capital	£1,548,725	£2,350,000
Uncalled liability	4,645,575	*Nil.*
Reserve fund	1,960,000	370,000
Deposit and other accounts ...	19,412.055	17,500,000
Profit for year	304,005	235,000
Dividend for year	13%	6%

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ADVERTISEMENT RATES ON APPLICATION

Automobile Notes.

To Repeat the Motor Show.

The consensus of opinion in the motorist ranks, shared by the community in general, is decidedly in favour of a repetition of an automobile show, along somewhat similar, though more complete, lines to that held last week in conjunction with the Agricultural Show. Although, strictly speaking, the show could not be classed, by any means, as representative of the motor business, the display, on the whole, having regard to the limited space available, was gratifying and augurs well for future exhibitions of this nature. In all some two dozen types of pleasure and commercial cars were on view, to which reference was made last week, these being 1912 models of the leading makes represented locally. A census of cars, however, registered in Johannesburg and on the Rand, will reveal the fact that a hundred or more different types of motor vehicles have been imported at one time or another locally, and are in actual service to-day. Many of these, of course, are not represented by agents; others, again, can only be obtained from the manufacturers, through local representatives holding agencies, but who indent exclusively in preference to taking the usual risks which attend stocking cars. For various reasons, other well-known makes of cars were not on exhibit, although represented locally, but it is understood that their absence, while being regretted, cannot be attributed to any indifference on the part of the agents in regard to the exhibition. While strenuous efforts, however, were made by the promoters, the S.A. Society of Motor Traders, to ensure the success of the motor section of last week's show, the number of exhibits, it may be said, inadequately conveyed to the visiting strangers the actual extent of the trade being done in automobiles; but the results, nevertheless, it is anticipated, will be of a far-reaching character. To the country visitors especially, who attended in record numbers, an appeal of a very practical nature has been made, and although the pleasure car, until the advent of a better all-round system of roadways in South Africa, may not command very serious attention from the dwellers in the more isolated districts, the petrol motor, so freely demonstrated at the show, as an aid to agricultural pursuits, was patent to all.

Coach Work.

The coach work of many motor vehicles on exhibit was a subject of much favourable comment during show week, the excellence of its character affording the local body builders food for reflection, so to speak. For the encouragement of this special industry, however, from a local standpoint, it must be remarked, that the commercial car bodies supplied and fitted locally, also on exhibit, were of a high order indeed, and in this reference a very wide and important subject is suggested, having for its nucleus the manufacture of automobile bodies by South African coachbuilders for the imported chassis. The scheme, on due consideration, will be found as practicable as it is desirable, first of all owing to the undoubtedly high-class nature of the work accomplished in South African carriage factories, which is difficult to detect from that imported; the suitability of the wood, so easily procurable in this country, adapted to withstand the climatic conditions to which cars are ever subject, and in addition other weighty considerations may be cited to further the promotion of the industry locally. For instance, it need hardly be remarked, the carriage painter with local experience is best informed naturally in regard to the peculiar requirements of South Africa, which differ so vastly from those obtaining at Home, and consequently his work is free from the blemishes, arising from inexperience, and ignorance of what is really required, so patent in much of the imported carriage work, besides the

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facilities for drying provided in this country produce recognised better results. How best to bring about this desired state of affairs, and so offer South Africa an exclusive field of operation, is not at once apparent, and cannot be effected even by a combine of the carriage builders; therefore, unless legislation is brought to bear in the matter, which, by the way, could do much by the exaction of a substantial tax on imported coachwork, the manufacture of motor bodies by local labour seems at present very remote.

1912 Models.

The classified lists and illustrations of the new 1912 models of automobiles form interesting subject for the many Home journals published in the interests of motoring. The prices, specifications and characteristics are undoubtedly bewildering in variety, presenting a formidable problem to the motorist and prospective motorist. One supplement alone contains illustrations of some 200 models, mainly of British and Continental manufacture, interspersed with a few of the better known American makes. An idea of the comprehensive nature of the field of choice is made possible by the fact that prices range, by easy stages, from the unpretentious single-cylindered two-seater, of barely six horse-power, catalogued at £135, to the ponderous and luxuriously fitted car of 90 horse power rating, offered at £1,840, a range certainly calculated to meet every imaginable requirement. As would be expected, these cars, in keeping with the immense advance which has characterised the motor industry of recent years, are replete in every respect, embodying every practicable feature for which scientific research is responsible and marked by an absence of complications which in the past militated against the car, from the point of view of popularity.

Accidents.

Although the streets of Johannesburg during the recent holidays were crowded to an excessive degree owing to the influx of visitors to the Agricultural Show, and other holiday attractions, the paucity of street accidents was a gratifying feature of show week, and once again favourably reflects the caution exercised by the motorist, who in turn is largely in evidence at holiday times, but whom the public delight to saddle nowadays with responsibility for most accidents, particularly in cases where the guilty party remains undiscovered. This customary practice is unjust in the extreme, and quite unworthy of an up-to-date community, who should, at least, recognise the steady increase in all forms of motor traffic, and likewise the attendant risks; but, to the pedestrian who, through his negligence, is the chief offender, it evidently never occurs how necessary it has become for him to adapt himself to the altered conditions, and act with the measure of caution in keeping with the demands of this age of speed.

Another Puncture Sealing Composition.

Still another puncture sealing composition has found its way on to the local market, promising big things, and as any device calculated to ameliorate the troubles which beset the motorist is of interest, a reference is here made to "Filibuster," a suggestive, if somewhat punical term, for a patent ingredient which is claimed to effectually seal up a puncture even when of formidable dimensions, in an automatic way, when pumped into the tube. The composition can be obtained locally, and in support of its claim a demonstration wheel is on exhibition at one or two of the principal garages.

To Students of Economy.

That old-established firm, the Johannesburg Vulcanising Works, have acquired the balance of the valuable stock of spare parts and fittings of the late Garage Continental, and are now in a position to offer, under landed cost, spare parts for such well-known cars as the De Dion, Standard, Napier, Darracq, and many others. The stock includes complete sets of gears, chains, ball races, and many other up-to-date fitments in daily requirement.

Contracts Open.

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of the following material to the Department of Posts and Telegraphs:—3 miles switchboard cable, 42 wire, as per specification; 2 miles switchboard cable, 63 wire, as per specification; 3½ miles switchboard cable, 84 wire, as per specification. Quotations must include delivery. as shown below, and indicate time within which delivery will be effected: Cable, 42 wire, Capetown 1 mile, Johannesburg 2 miles; cable, 63 wire, Johannesburg, 2 miles; cable, 84 wire, Johannesburg, 3½ miles. (May 8.) For the supply of leather bags, 16in. by 10in. by 4in., to the Department of Posts and Telegraphs during the period 1st May, 1912, to 31st March, 1915. Delivery must be effected in batches of 100 as required. (May 1.) For supply of mealie meal, forage and paraffin (or petrol) tins to the Forest Department, Transvaal Conservancy. The supplies required are as follows:—Government Nursery of Plantation at Belfast, 50 bags mealie meal; Ermelo, 120 bags mealie meal, 12,000 lbs. forage; Irene. 200 bags mealie meal; 14,000 lbs. forage; Graskop, Pilgrims Rest, 90 bags mealie meal; Jessievale, Lake Chrissie, 140 bags mealie meal, 10,000 lbs. forage, 45,000 5gal. paraffin or petrol tins; Lichtenburg, 90 bags mealie meal: Machavie, Potchefstroom, 80 bags mealie meal, 8,000 lbs. forage: Middelkop, Tzaneen (nearest railway station, Munnik). 130 bags mealie meal; Pan, Middelburg, 120 bags mealie meal, 36,000 lbs. forage; Woodbush, Haenertsburg, 150 bags mealie meal. May 8.) For the supply of leather to the Central Prison, Pretoria, and the Breakwater Reformatory, Capetown. (May 15).

The Chairman of the Tender Board, Provincial Auditor's Office, Capetown, invites tenders for the reconstruction of bridge over the Knysna River. (May 13.)

The Municipal Council of Johannesburg invites tenders for the supply and erection of constructional steelwork in floors and roofs, etc., for the new Town Hall and Municipal Offices, Johannesburg. (June 14.) Automatic oil switches (May 2). Points and crossings for tramways (June 21). Books of coupons, wood-working machines, water piping (April 30). Motors, bitumen sheeting (May 3).

The Municipal Council of Krugersdorp invite tenders for 5,6000 Imperial gallons of creosote (May 13).

The Klerksdorp Municipality invites tenders for certain material required by the Electricity Department for extension of mains (April 25).

The Secretary to the Tender Board, S.A.R., Headquarter Offices, Johannesburg, invites tenders for the supply of mealie meal required for the Natal and Orange Free State Provinces (April 23). For the supply of 2,741 Petersburg standards of Baltic timber (June 11).

The Chairman of the Tender Board, Provincial Secretary's Office, Bloemfontein, invites tenders for the following services in the Province of Orange Free State: Erection of teachers' quarters at Bothaville, erection of teachers' quarters at Bultfontein, erection of teachers' quarters at Lindley Poort, erection of teachers' quarters at Modderpoort, erection of teachers' quarters at Odendalsrust, erection of teachers' quarters at Philippolis Road, erection of teachers' quarters at Theunissen, erection of teachers' quarters at Villiers, erection of teachers quarters at Waterworks, erection of teachers' quarters at Weltevreden (May 7).

The Wolhuter Gold Mines, Limited

(Incorporated in the Transvaal).

DIVIDEND No. 9.

NOTICE is hereby given that a Dividend of Eight and Three quarters (8¾) per cent. for the six months, ending 30th April, 1912, equal to 1/9 per £1 share has been declared payable to Shareholders registered on the 30th April, 1912. Dividend Warrants will be paid out as soon as practicable after the receipt of London Transfer Returns to that date. Holders of Share Warrants to Bearer are informed that they will receive payment of the Dividend on presentation of Coupon No. 9, at the London Office of the Company, Salisbury House, London Wall, E.C.

The Transfer Registers of the Company will be closed from the 1st to the 8th May, 1912, both days inclusive.

By Order of the Board,

H. G. L. PANCHAUD,
Secretary.

Head Office,
Johannesburg, 12th April, 1912.

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Notes and News.

Geldenhuis Deep. Rumours have recently been current to the effect that work in the Jumpers Deep section of the Geldenhuis Deep property was to be restricted on account of unfavourable developments. We are in a position authoritatively to deny this, and to state that the latest developments in this portion of the property show considerable improvement.

* * * *

A Haenertsberg Resuscitation. The old Woodbush Mine, in the Haenertsberg district, is being reopened. We learn that the development work carried out under the new auspices is satisfactory, and that favourable reports have been made by Drs. Merensky and Jorissen as to the possibilities of the undertaking.

* * * *

Zinc Ore from Africa. "A car-load of zinc ore has just come from an unusual distance to the ore testing plant of Henry E. Wood & Co., Denver," says *Mining Science*, of Denver, Colorado, U.S.A. "The consignment is from Africa, and the metallurgical qualities of the ore will be tested out in this city." This no doubt refers to the consignment sent from the Blane Witkop property on behalf of the Eckstein interest.

* * * *

A. Goerz & Co., Ltd. The accounts of Messrs. A. Goerz & Co., Ltd., for the year ended on December 31st last show a profit—before providing for writings off in respect of shareholdings—amounting to £57,756, which amount has been devoted to writing down part of the depreciation in shareholdings. After allowing for this, the shareholdings stand in the accounts at £1,294,452, while their aggregate value at December 31st last, based upon market prices, or upon the directors' valuations where no market price exists, was £1,175,752. The difference of £118,700 is more than covered by the reserve account of £160,000, and the sum of £38,568 brought forward from 1910, which is carried to new account.

* * * *

Pilgrims Rest Activity. A wave of activity appears to be passing over the Pilgrims Rest district at the present, and judging from latest advices received from the district, there appears to be every justification for adopting an optimistic view as to the likelihood of extensive and satisfactory developments resulting. In so far as the leading proposition of the Pilgrims Rest gold fields (the Transvaal Gold Mining Estates) is concerned, we learn that a rich strike of ore has recently been made at Broken Hill, and that at the Theta Mine, too, a valuable pocket has been encountered. As to the smaller properties, it is understood that the Pilgrims Creek G.M. Company have found the Theta Reef extending from Desire to the boundary of Wanderers North and varying from 6 to 20 inches in width, with a consistent value of about an ounce per ton. On the Pilgrims Venture the Green Reef is said to be averaging 10 dwts. per ton over a big width. On Graskop the upper workings of the Mac Mac are opening up well, whilst the ground held by the Middelburg Syndicate has been purchased by Johannesburg capital.

* * * *

Tweefontein. At the fifth ordinary meeting of the Tweefontein Colliery, Lord Oranmore and Browne had a very encouraging speech to deliver to shareholders. The gross profit amounted to £25,048, and after deducting Debenture interest, London charges, and allowances for depreciation, a sum of £8,182 remained. With the carry forward from last year, the directors had at their disposal £10,269, and they now recommend the payment of a 12½ per cent. dividend on the Ordinary shares, which will absorb £5,730, leaving £4,538 to go forward. The position of the colliery is excellent, and if only railway rates could be brought down so as to enable it to compete in the Eastern markets, a largely augmented profit could be secured.

Chemistry in South Africa.

"Nowhere on the face of the earth is there a grander field for chemical investigation than in South Africa; never in the history of this land was there a more opportune time to begin it." This pronouncement is taken from the concluding portion of the Presidential address delivered by Dr. C. F. Juritz at the annual meeting of the Cape Chemical Society, and those who realise how large a part is taken by science in modern industrial developments will find much that is of interest in the address. The main object of the address was to indicate the scope and direction of chemical research and investigation as indicated by the needs of this country and the opportunities that it affords.

* * * *

The Bloemhof Diamond Diggings.

After the fanfare of trumpets that were supposed to usher in Mooifontein and London as alluvial diamond fields of extraordinary merit a few months ago, the recent dearth of news from this portion of the Transvaal is specially striking. We have every reason for believing that there have been many departures from Mooifontein of late, and a much larger number of disappointments. Many of the more fortunate ones of a few months ago are known to have secured poor returns of late, and numbers have either sought pastures new, or are making up their minds to leave if their luck does not turn for the better at an early date. As far as London is concerned, the anticipated "rush" has not materialised. There are to-day only about forty or fifty diggers on the farm, and whilst some good stones are reported to have been found of late, nothing approaching the brightly optimistic and enthusiastic tone of a few months ago seems to prevail at the present. A new strike has recently been made near Bloemhof. This is known as the Race Course Run, and it appears to have attracted a considerable number of diggers. But, on the whole, the Bloemhof diamond diggings appear to be labouring under pretty much of a cloud at present, and, in the light of past disappointments, it will, we think, take a great deal to dispel the present pessimism.

* * * *

Romola Nigel Returns.

Principal interest in the Romola Nigel Company's Rhodesian properties centres for the time in the Claydon property, in which two levels have been opened up. Development here, according to the assay plan, is quite satisfactory, the ore values and widths showing up very well. During March the 5-stamp mill of the company crushed 546 tons, and the current tailings treated amounted to 315 tons. The total recovery was £1,171 7s. 5d., equal to £2 2s. 10d. per ton. There were 231 tons of slimes stored. The tonnage all crushed came from the Claydon. The total working costs were £762, equal to 27s. 11d. per ton. The expenditure on capital account was £459.

* * * *

A Well-Merited Honour.

It was a fitting and becoming act on the part of the Institution of Mining and Metallurgy to recognise the efforts made in behalf of mining and metallurgical education in the heart of the Empire by Mr. Walter McDermott, by the presentation to him of the gold medal of the Institution. It would take long to record the extent and character of those labours which have at last borne good fruit in the ample equipment of the Bessemer Laboratory at the Royal School of Mines, and in the great measure of influence acquired by the Council of the Institution in the governing body of the School itself. Mr. McDermott, who is a past President of the I.M.M., and a member of the governing body of the Imperial College of Science and Technology, has the following record in "Who's Who in Mining and Metallurgy":—"1870, Analytical Chemist, Glaisdale Iron Works, Yorkshire, reporting on iron mines. 1871-75, Assayer, Silver Islet Mine, Lake Superior, reporting on gold and silver mines, joint inventor of Frue vanning machine in charge of concentration department 50-stamp mill; surveying and prospecting parties. 1876, investigated concentration methods Cornwall, Germany, Austria and Italy, planning mills in United States. 1877-80, reporting on gold and silver mines Colorado, Utah, Nevada, California, Montana; Manager Belmont Gold Mine, Montana. 1881-88, reporting on gold, silver and copper mines, Lake Superior, Newfoundland, Colorado, Utah, Idaho, Nevada, California, Montana, New Mexico, and Southern States; joint owner and manager Ore Milling and Testing Works, New York. Since 1889, Consulting Engineer in London. Managing Director Fraser and Chalmers, Ltd., 3, London Wall Buildings, London, E.C." It will be remembered that Mr. McDermott visited the Rand last year, and nowhere will the honour paid him by the Institution be more welcomed than in this country.

* * * *

Mining Institute.

We have received from Professor Yates a prospectus of the special classes held at the Mining Institute in connection with the different Government certificates of competency, and we congratulate the students on the thorough way in which their requirements are to be met. Professor Yates' work is well known, and we are probably well within the mark when we say that hundreds of our officials on the Rand owe their position largely to his excellent teaching. He was one of the first to realise some years ago the needs of the men on the mine, and met it by his well-remembered and very successful Reef lectures. His present activities are confined to preparing men for the qualifying Government certificates of competency, and we consider the Reef very fortunate indeed in having his services available.

* * * *

The Future of Rhodesia.

The future of the British South Africa Company and of Rhodesia on the expiration of the Charter in 1914 is always a fruitful theme for speculation. It is, therefore, highly interesting and important to observe that in the report and accounts submitted to shareholders at the annual meeting of the Chartered Company, held in London the other day, the accounts are segregated according as to whether they concern administrative revenue and expenditure or commercial revenue and expenditure. In other words, the administrative and commercial departments of the B.S.A. Company are now divorced much more effectively than formerly. Despite all that has been said and written to the contrary, the opinion that Rhodesia will be absorbed by the Union within the next year or two is a perfectly natural view to take as to the future of the Chartered territory. The new segregation of accounts referred to above would appear to indicate that the directors of the company are preparing for the Union Government to take over the administration of Rhodesia, and to continue the development of their vast commercial estate purely as an industrial concern. The forthcoming visit of General Botha to Rhodesia tends to strengthen this belief.

* * * *

Benoni and Apex.

Since the article on the Apex-Benoni position, which appears on another page, was written, the announcement below has been made. The following statement was cabled to the London offices of the Benoni Consolidated Gold Mines, Ltd., and Apex Mines, Ltd., on Thursday:—"It has been found impossible to work profitably with the existing cyanide plant, which will require to be remodelled, and as under these conditions it is inadvisable to deplete the ore reserves, the board have decided to temporarily suspend operations. The board have under consideration certain proposals for the amalgamation of your company with the Apex Mines, Ltd. (Gold Section), and the provision of adequate working capital. Under these proposals it is suggested to bring the reduction plant capacity up to 40,000 tons per month, on which basis the combined company should be able to mill in about a year's time. The boards of both companies have secured the services of Mr. C. D. Leslie, consulting engineer to the Consolidated Gold Fields of South Africa, Ltd., who will make an independent report and valuation, which will be submitted to shareholders. The report will state, *inter alia*, whether the proposed amalgamation is a sound mining proposition, and whether the terms proposed are fair and equitable to both companies." The need of making provision, sooner or later, for the further financial requirements of the Apex Mines, and the necessity of beginning to consider the future crushing operations of the company, affords an opportunity for discussing the advantages of an amalgamation scheme which might not present itself so conveniently at a later date. A judicious fusion of interests is obviously a course which should improve the prospects of both companies.

* * * *

Klerksdorp Proprietary Mines.

Mr. D. Symons, who presided at the fourteenth ordinary general meeting of the Klerksdorp Proprietary Mines, Ltd., on Thursday, expressed the regret of the board at their inability to pay a dividend this year, owing to the large amount it was deemed advisable to set aside to meet any losses that might be incurred in depreciation of the company's shareholdings. The directors, he stated, had become somewhat alarmed at the heavy fall in the price of Main Reef West shares and debentures, in which concern the Klerksdorp Proprietary have a large holding. Accordingly Mr. Creswell was commissioned to report on the property. Mr. Creswell spent some seven weeks in making an exhaustive examination of the mine and plant, and his report is in every way satisfactory. Mr. Symons remarked that it fully corroborated the reports issued by the consulting engineer and manager of the company. "The fall in the price of these shares," he remarked, "cannot, I am satisfied, be attributed to any depreciation in the values of the mine." Mr. Symons hinted at the likelihood of amalgamation rumours, as between the Main Reef West and Consolidated Main Reef, having depressed the stock. "I am assured, however," said Mr. Symons, "by the chairman of both of these companies that such an amalgamation is not contemplated, and that with a sufficiency of labour we look forward with confidence to a marked improvement in the profits made by this company from now onward—a result which should speedily manifest itself in increased dividends and enhanced prices for the shares."

* * * *

Native Labour Developments.

That the strenuous efforts being made by the groups to secure co-operation and uniformity in recruiting native labour within the Union promise to be successful is indicated by some remarks made by Mr. O'K. Webber at the annual meeting of the Witwatersrand Native Labour Association recently. He pointed out that the attention of the various groups had been seriously occupied with the increased cost of native labour per shift, owing to the competition which had taken place of late between the various groups and contractors in recruiting natives within the Union. It might have been felt that a large portion of this expense might be saved if facilities were given to natives to offer themselves for work on the mines they might select at convenient attesting stations close to their homes, and that advantage should be taken of the tendency for natives to come up to work on these fields of their own accord, thus avoiding the services of the recruiter. This has been particularly marked of late amongst natives in the Northern Transvaal. In order, therefore, that this tendency might be encouraged amongst the natives of the Cape Colony, and in order that they might be given every facility to emigrate from the Transkeian territories for work in the Transvaal, the W.N.L.A. has lately inaugurated a system of establishing forwarding stations at convenient places in the Transkei and Pondoland, where natives wishing to work on any particular mine can accept the terms offered by that mine and engage themselves on the spot before proceeding to the Transvaal. It is hoped that by this means the natives of the Transkeian territories will gradually learn to find their own way from their homes direct to the mines on which they wish to work. They will be given every facility for coming up to the Rand, although those in charge of these volunteer attesting stations will not in any way engage in what is known as recruiting the natives for work. "As time goes on," said Mr. Webber, "it is hoped to extend this system to all the territories within the Union, and thereby do away with expensive organisations for recruiting natives and the paying out of advances to them before they leave their homes." The statement we welcome as an indication that the "insensate competition" for natives in the Union may soon be brought to an end.

TOPICS OF THE WEEK.

COMMERCE AND MINING.

It is but natural that the commerce of the country should continue very faithfully to reflect the progress of the mining industry, and the speeches made at recent annual meetings of the leading Chambers are, therefore, second only in importance to that made at the Chamber of Mines. Speaking at the annual meeting of the Johannesburg Chamber of Commerce, last week, Mr. R. Hamilton, the President, in the course of his address, said that during the year 1910 the mines in the Transvaal consumed stores to the value of £13,813,228, and in 1911 £12,460,281, showing a falling off during last year of £1,353,007. This, of course, was to be expected, as most of the big plants ordered in 1909 and 1910 were delivered prior to last year, and no further new construction work of any magnitude came along. The business done, however, in the ordinary everyday requirements of the mines remained about the same at the beginning of last year. Mr. W. A. Martin had issued a word of caution to the mercantile community to be careful in making up their home indents, as the outlook did not appear to be so promising as it had been during the two previous years, and, judging from the railway returns on sea-borne traffic forwarded from the ports to the competitive zone, that warning was timely and sound. The state of trade in certain branches since that statement was made had not improved, and again he advised the merchants to be careful to prevent over-stocking. When he said certain branches, he referred more particularly to mining and electrical supplies, as well as those engaged in the timber trade.

In the same connection it is noteworthy that Mr. Jagger, in his Presidential address at the fifty-first annual meeting of the Cape Town Chamber of Commerce, last week, was able to dwell on numerous indications of prosperity in the Union at large, and in Cape Town in particular. The imports and exports, the statistics of railway, postal, and telegraph business, the Customs returns, and the transactions of the banks, were all quoted in evidence of the advancement of the country, and the large falling off in insolvencies may be considered as some evidence that the enhanced prosperity which the country is enjoying is of a solid character. Mr. Jagger sounded a warning note in regard to the large part which raw minerals play in our export trade. Of our total exports last year, minerals accounted for no less than 81·8 per cent., as compared with 80·4 per cent. in the previous year. This, Mr. Jagger says, is not a satisfactory position for South Africa, since the tendency must eventually be for the export of minerals to decrease as the mines get worked out, and "it is not satisfactory that our national expenditure and the national liabilities we are piling up should be based, as they are, on what is after all a diminishing asset." There is, however, no reason why this position should be unsatisfactory, unless people are deceived by it. The mineral resources of the country will hold out for years yet, and by the time the mines are worked out, the prosperity which is at present due chiefly to the wealth that they produce should be firmly established in agricultural and other industries. Mr. Jagger referred particularly to the trade of the Union with Rhodesia, German South-West Africa, and the Congo. Our trade with each of these territories, each in its measure progressing rapidly, is increasing; but, even apart from the development of South African industries, there seems to be room for further expansion. Mr. Jagger also referred to the trade in bunkering coal, in which Cape Town has made great strides. In 1910 the vessels calling at that port took into their bunkers 83,510 tons of coal; in 1911 the amount rose to 202,767, an increase of 143 per cent. Mr. Wiener, who followed the President, made further references to this point, and urged that the coal supplies available in Natal would go far towards neutralising the heavy tolls exacted by the Suez Canal authorities, and proposed to be levied on vessels passing through the Panama Canal. Mr. Wiener's view is that the coalfields of Natal will make it possible for the Cape to regain its ancient position as a calling place on the great Eastern trade routes.

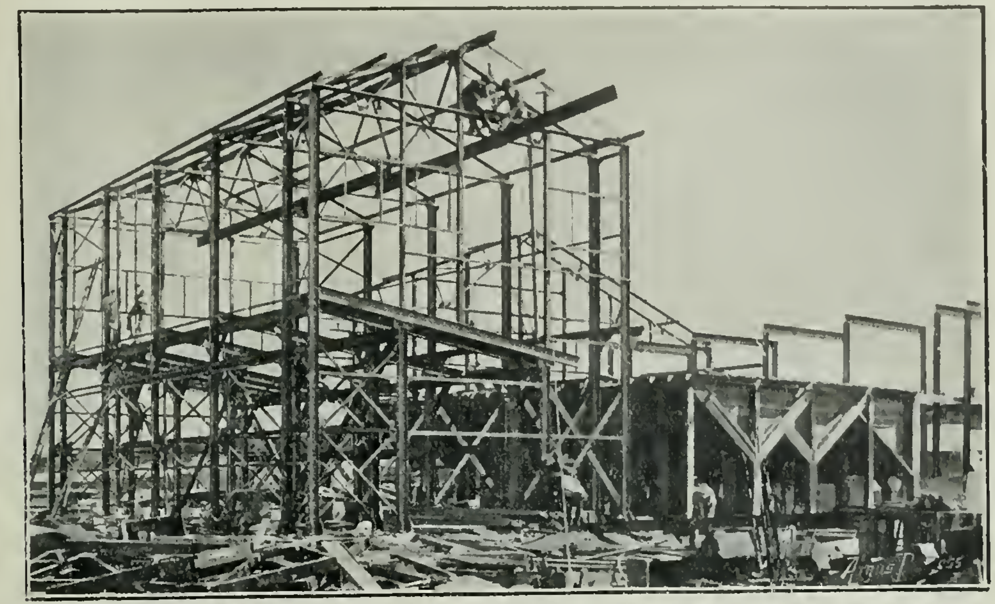
In our next issue will appear the annual review of Rand trade embodied in the report of the Johannesburg Chamber of Commerce. It proves, if anything were needed to prove, how intimate remains the connection between mining and commercial conditions. Indeed, it cannot be too often repeated that until agriculture and the minor industries have had time to expand, the trade of South Africa is indissolubly bound up with the mining industry. When critics reproach us with devoting but one-third of this paper to purely commercial matters, our reply is that every portion of each issue, not even excluding those relating to the mines, has a direct and immediate bearing on our commerce. No divorce between the two branches of activity is possible, no exact dividing line can be drawn between them. For this reason, no attempt is made to label the majority of articles printed. The engineer, the business man, and the purely mining man will regard each from his own point of view, and extract from it information of the kind he seeks. Expansion of industry obviously spells expansion of trade, and for a reliable index and barometer of the latter the chronicle of the former cannot be beaten. For the same reason, no apology is needed for giving first and extended notice to the annual reviews of the commerce of the country lately presented. Mining progress at the present moment is sound, steady and unsensational; the same description is rightly and equally applicable to South African commerce.

THE OUTLOOK FOR TRANSVAAL LANDOWNERS.

The annual report of the Transvaal Landowners' Association and the speech of the Chairman, Mr. W. Pott, at the general meeting last week, confirm the good impression of the farming outlook conveyed by the recently-issued annual reports of African Farms and the Transvaal Consolidated Lands. Mr. Pott's opening remarks give the key to his opinion of the outlook. "In taking a bird's-eye view of the work of the Association during the past year," he said, "I find reason to congratulate members upon the solid work accomplished. Our work is markedly co-operative, assisting each other in perfecting our knowledge of widely-scattered properties, so widely scattered that no one system of development is applicable all round, in guiding and controlling an aboriginal population in most cases found resident in outlying districts when we appeared on the scene, and in settling properties suitable for white settlement. These are our objects." How successfully these objects have been furthered during the year Mr. Pott went on to show. Regarding the general progress of the land industries, a general advance in the position of those already established on the land is reported. Having reviewed agricultural progress in detail, Mr. Pott entered a spirited plea in defence of the landowners. "Land companies, such as are the bulk of our members, are frequently most unjustly accused of failure to settle and develop their holdings," he said. "With 23 years' experience of land companies' work in the Transvaal, I can honestly say that they have done more to develop agriculture than any other body of landowners. Who, bar Government, has planted trees to such an extent as the Vereeniging Estates or the Transvaal Consolidated? Who has given such long leases and right of purchase as the great land companies? Who has assisted tenants with stock, fencing materials, boreholes for water, and building material for houses like many companies I could name? Labouring under the disadvantages as they mostly do of holding the bulk of their areas in the northern and more outlying districts less suited for settlement than the highveld, I challenge evidence to show that even the Government, with its vast resources, has accomplished more or sounder settlement." It is noteworthy that returns obtained from 21 members of the Association show that out of 4,939,000 morgen owned, 4,336,200 morgen are situated in the bushveld, leaving 602,800 morgen in the highveld. Last year the Association had 649 white occupiers, and this has increased since. Some companies work large areas themselves, as in the case of the Transvaal Estates and Development Company, who have 6,000 acres under plough on one estate; and 454,947 morgen is the area occupied by white tenants in the highveld. After making allowance for what has been done in the last 10 years, and for the fact that the unoccupied areas lie almost all in the dry middle veld, where gal-lamziekte is checking settlement, we agree with Mr. Pott that there can be no truth in the accusation that land companies are holding up great areas of land suitable for settlement. The bulk of the landowners have adopted the sound policy of very low rents for a start to give the settler a chance of utilising his available means for reproductive work, and with a long lease and right to freehold at market value when the tenant has overcome initial difficulties, no better system of settlement could be adopted. It is gratifying to know that land companies' tenants are among the most prosperous settlers in the country, and numbers of them are acquiring their freehold titles every year. Most land companies acquired their holdings with a view to mineral developments, and they in their own interests only seek to retain mineral rights and to place the agricultural rights in the hands of those who work on their own account. It could not be otherwise, as no company could control effectively the required number of managers each spending the company's capital on properties spread over thousands of miles of a country sparsely inhabited and with only limited means of communication. Though the Landowners' Association is strictly non-political and is merely a body of business men co-operating to attain the best results in their work, which is not competitive, except in the ambition to attain the highest perfection, it is the fashion in political circles to make generally inaccurate accusations as to the work land companies are doing. Mr. Pott stated that he should welcome a Commission of Enquiry before which members could produce evidence as to what they have accomplished, as they would have no need to blush for the results. From Mr. Pott's speech we learn likewise that the value of land generally has shown a marked rise, more particularly in the highveld, where farming has been more successfully carried on since the war than it has ever previously been. The gross production per acre on many highveld farms would astonish most people, and Mr. Pott declared that in a number of ascertained cases this exceeds £2 per acre per annum, reckoned over the whole area of farms partly cultivated and partly stock land. The mining population is very largely interested in farming, either directly as where men retire from the mines on to farms, or by a sleeping partner on the mines who supplies funds. In regard to this Mr. Pott declared: "Here we see the true relationship between mineral and agricultural interests; the first gives the impetus to progress which is carried on by the slower but more lasting industry. Our captains of industry have almost without exception large private farming operations in hand on their own individual accounts. Long may it continue, and closer and closer may it grow." Considerations of space forbid us making more than the foregoing few extracts from Mr. Pott's review and defence of the Transvaal Landowners' activities, but enough has been quoted to prove that to their efforts is due in no small measure the gratifying progress recently shown by farming in the Province.

THE CONSOLIDATED LANGLAAGTE NEW PLANT.

Crusher and Sorting Station—Well Arranged Equipment—Open-fronted Mortar Boxes.

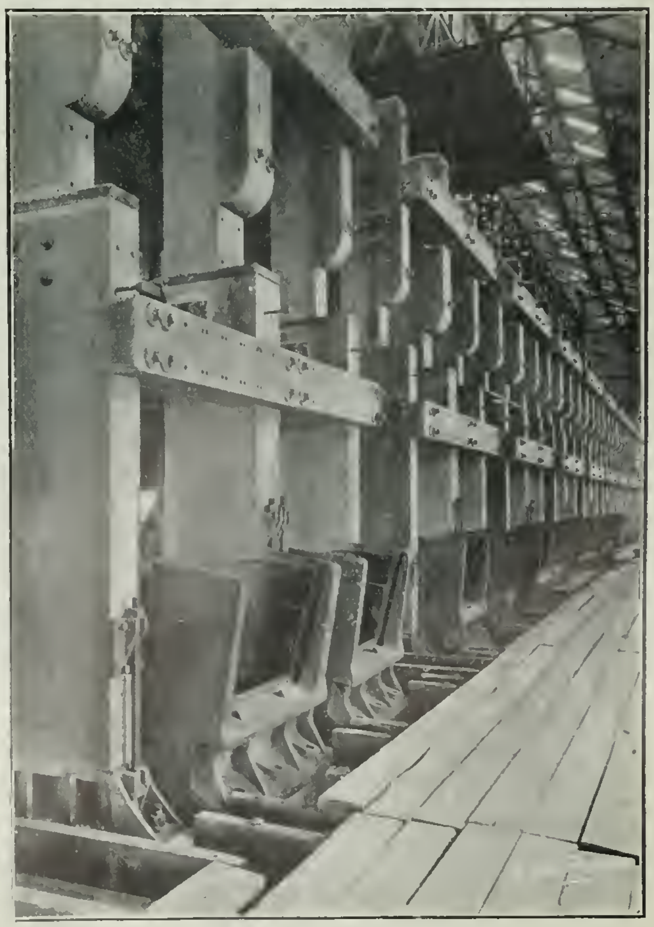


Crusher and Sorting Station, Consolidated Langlaagte.

A few weeks ago we reproduced some photographs which showed the principal structural features of the new 100-stamp mill at the Consolidated Langlaagte. The accompanying illustrations will serve to give a good idea of the new crusher station, which is situated immediately at the back, or upon the south side of the mill. The ore, taken from the ore-bins at the shaft just as it comes from the mine, without any separation into coarse and fine rock, will be conveyed by electric haulage to the crusher station. Here it will be delivered to the receiving bin shown in the first picture, just above the ground line at the lower end of the sorting belts. It will be fed from the bin through shoots into the three conveyor belts, and carried upwards to the sizing and washing trommels. There will be three separate units in the sorting and crusher house, each comprising a trommel, sorting belt and crusher. The screened fines from the trommels will be discharged to a cross-conveyor delivering on to the main belt feeding the mill. The cross-conveyor also carries the dewatered washings from the trommels to the main belt. The waste rock will be thrown into bins beneath the sorting belts, and sent by means of trucks to the waste dump. The crusher product is delivered by another cross belt to the main conveyor going to the mill. In the mill there will be the usual shuttle belt delivering to the bins.

Open-fronted Mortar Boxes.

The stamps are of the heavy type, arranged in single line, instead of upon the more common back to back principle. In an accompanying illustration will be seen the low



Open-Fronted Mortar Boxes, Consolidated Langlaagte.

open-fronted type of mortar box, which has come into use in some of the latest mills. The stamps themselves are not in place, but it may be added that as the modern tendency on the Rand is to use stamps with short stems and very long heads up to 48 inches or so in length, the mortar boxes which would become inconveniently deep on the old plan are made low, and allow of the heads projecting through a light housing of steel plate or wood and canvas, which serves to keep back the splash. The cast-iron shoes, with the king posts bolted down into them, are well shown.

Conveyor Belts, Consolidated Langlaagte.

APEX AND BENONI.

Considerations Governing the Forthcoming Amalgamation.

In view of the fact that the Apex and Benoni companies are to be amalgamated—a circular printed elsewhere deals with the matter—and that the proposition is under discussion by those most concerned at the present moment, the relative position of these two undertakings becomes a matter of more than usual interest. To take the ore reserves, it may be noted that at the end of last year there were developed at the Apex some 337,259 tons of ore, of which 258,060 tons, estimated over a milling width of 54·12 inches, were payable, the milling value being 6·5 dwts., while the unpayable balance of 79,199 tons, calculated over a milling width of 46·75 inches, were assessed at a milling value of 2·89 dwts. The ore reserves at Benoni, at the same period, were reported to be 606,839 tons, with a milling value of 6·56 dwts. over a width of 43·12 inches, and 362,507 tons valued at 3·28 dwts. over a milling width of 41·82 inches, the percentage of payable being 76·5 in the first instance, as against 62·6 in the second. The development at the Apex has latterly been said to be of a distinctly satisfactory kind and the consulting engineer has been confirmed in an opinion expressed more than twelve months ago that development over a large area should expose conditions approximating closely to those obtaining in the Brakpan Mines. The development workings comprise two shafts, north and south, the latter directly on the dip of the former, and distant, horizontally, about 6,346 feet. The two are to be connected by a main incline, which at the end of last year had reached a depth along the dip of 2,195 feet from its intersection with the north shaft. No sinking of any importance has been done at the south shaft, although the necessary headgear, compressor plant, hauling engines, and steam plant are all in place, the company having decided to utilise all available funds in the northern section. A remarkable addition to the equipment of the main incline is a system of conveyor belts, in sections, by means of which ore is carried from the various levels to a main ore bin at the bottom of the north shaft. The installation is worked by electric power, and has been so contrived that upon the stoppage, from any cause, of any of the separate conveyor units, the whole series are immediately thrown out of action, and disorder and damage are avoided.

Although the company is in need of further financial supplies in order to carry out the whole scheme of development proposed, there was, nevertheless, a cash balance of £80,000 available at the end of 1911 for the use of the gold section of the property, and the Board decided to employ it for the increasing of the ore reserves. The question of further capital has, of course, been receiving the further attention of the Board, and an amalgamation with the Benoni Company has doubtless been under consideration, if only vaguely, for a long while past. Without knowing anything of the lines upon which such an arrangement would be likely to be effected, one can only express the opinion that an amalgamation on a fair financial basis would doubtless be a good scheme for both companies. It is also suggested that the Van Ryn Deep has been consulted on the subject of joint operations. Whatever be the proposals before the respective boards, there can be little doubt that they will be sufficiently advanced in time for the Benoni meeting on the 22nd May next. In the event of the discussion of amalgamation proposals having reached a more or less definite stage, it is not improbable that some decision will very shortly be arrived at with regard to the milling operations at Benoni, which are not doing much more than just paying their way.

Worcester Gold Mining Co.

A detailed report of the Worcester G.M. Company for March states that 5,150 tons were crushed on 27·13 days; yield from mill, 918·91 ozs.; yield from cyanide, 321·08 ozs.; total yield, 1,272·99 ozs., valued at £5,378 7s. 8d. Approximate profit, £1,730.

Mines of the Witwatersrand.

XV.—CITY DEEP, LTD.

A Great Mine with a Great Future—Results to Date No Criterion of Real Potentiality—The Mining Scheme—The Extensive and Modern Equipment Described.

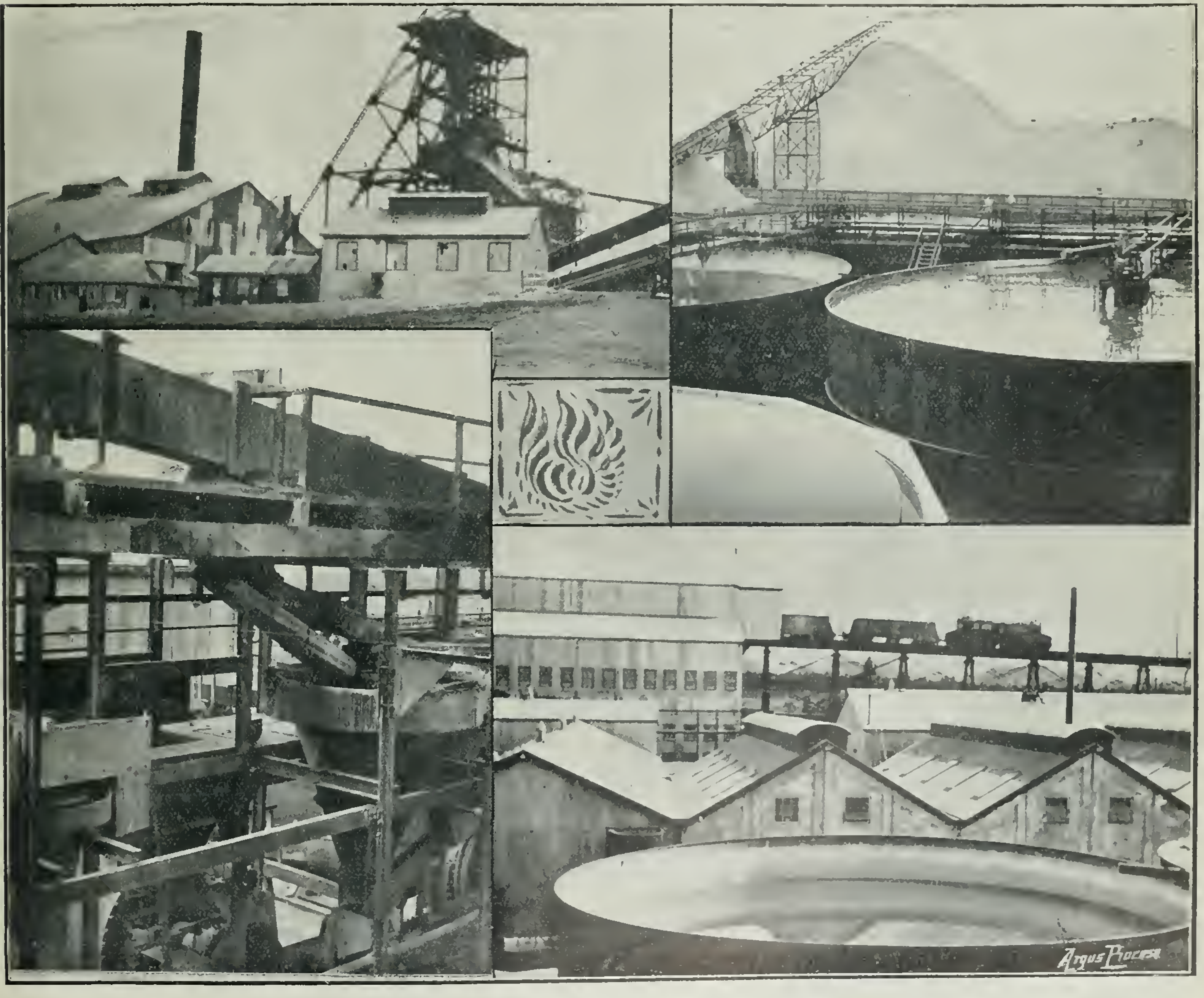
Few mines on the Rand have attracted more attention than the City Deep. In the mid-nineties the Bezuidenville borehole did not, according to popular opinion of that time, augur any too hopefully for the future of the group of deep levels known as the City Deep, South City, Wolhuter Deep, South Wolhuter and Klipriversberg claims. For years these blocks lay dormant, but in 1905 the idea of fusion, which had no doubt been in the minds of their sponsors for a long time, took definite shape, and with the idea of amalgamation in view two seven-compartment shafts were started, and the exploitation of the property was commenced with a view to comprehensive working.

EARLY DEVELOPMENTS.

Reef was encountered in the No. 2 or western shaft in March, 1908, and in the No. 1 or eastern shaft in December, 1908. Early development quickly established the great potential value of the property. In his speech at the meeting held in March, 1909, the chairman of the company called attention to the remarkable persistency of the gold contents throughout the Main Reef Leader, the good values obtained from the No. 1 shaft, the improved grade of the City and Suburban in depth, and the regular distribution of the gold in the City Deep itself at the western shaft. He further stated: "The Main Reef Leader of the City Deep to-day not only shows a probable yield per ton which will place this company among the richest producers of the Rand, but with its average dip of about 38 degrees promises to yield over 35,000 tons per claim, irrespective of Main Reef and South Reef bodies." Very possibly an exaggerated view of the profit-earning abilities—the immediate profit-earning abilities it would be more correct to say—was read into these remarks.

City Deep: West Shaft Headgear.

City Deep: A Portion of the Cyanide Plant, Tailings Dump in Background.



City Deep: Classifying Cones and Portion of Tube Mill Plant.

City Deep: A Portion of the Cyanide Plant in the Foreground. Mill, Showing 40-ton Trucks and Electric Loco. in the Background.

They were wholly justified, as some study of the recent results secured by the mine should demonstrate, but it appears that too much has been expected of the property in the first year or two of its production.

RUMOURS AND REALITIES.

It is difficult to understand whether this attitude has been the parent of the many sensational rumours that have been in circulation regarding the mine or not. Suffice it to say, however, that the City Deep has been the subject of many unfavourable reports—a few founded on reason, the majority on baseless rumour. To bring a proposition of the magnitude of the City Deep to the productive stage cannot be achieved without difficulty. Troubles are bound to be experienced, both above and below ground, and especially if labour is insufficient and inefficient must difficulties be expected. With regard to the reports current at one time as to the faulty features in plant construction, we will remark that, whatever constructional defects have had to be remedied in the past, the equipment is now running smoothly and satisfactorily, and is fully capable of securing high extraction at comparatively low cost, from sixty thousand to sixty-five thousand tons of ore per month were sufficient labour obtainable to produce such a tonnage. As to the underground position, criticism against the City Deep mine has mainly alleged an insufficient number of stope faces and exaggeration in estimates of ore reserves, also that waste rock is being crushed to show a spectacular tonnage factor. At the end of January there were, according to Mr. Tillard, the acting manager, fifty-two stope faces, of which fourteen were in back stopes. Mr. Tillard, in his report, further stated: "With reference to the development, forty-six drives, winzes and raises are being advanced, and work would be immediately commenced in forty-nine additional faces if there were sufficient native labour." It is true the number of faces is comparatively small, small at any rate for a mine of the crushing capacity of the City Deep, but it is clear that this is largely a matter of labour.

EFFECTS OF LABOUR SCARCITY.

The consulting engineer, in his report, admits that a more conservative view has to be taken of the workable size of blocks developed above the upper level of the mine, and that this is the chief reason for a reduction in the ore reserves as compared with the preceding year. More ore was stoped than developed last year at the City Deep, and the pay limit has been slightly increased. Work last year was greatly hampered by labour shortage. That available was concentrated on increasing the output from the mine, to the detriment of development. A breakdown of the pumping plant towards the end of the year further hindered operations. But as against these adverse factors, it must be pointed out that ventilation has been much improved, and that, despite the decline in reserves, the tonnage blocked out to-day is well-nigh three years ahead of the full milling requirements, whilst the value at over 8 dwts. is appreciably above the Witwatersrand average. We understand, too, that lately a considerable amount of additional development required to render the whole of the reserves available for stoping has been achieved, and that, furthermore, certain additions have been made to the ore reserves in new ground. As to the crushing of dump rock, 109,716 tons were crushed last year from this source, and a profit of just under £25,000 was derived therefrom. To-day something like 20 per cent. of the ore is being derived from the surface dump. This ore assays about 4 dwts. per ton.

A VAST AREA: LAY-OUT OF THE MINE.

The mining area of the City Deep property is equivalent to 1,099 mining claims, including 13·5 claims in respect of mining rights under certain water-rights, bewaarplaatsen, etc., acquired from the Government. In the upper portion of the property the extent from boundary to boundary is 9,700 feet, and in the lower section, that is below the elbow that juts out from the Nourse Mines, 11,800 feet. The proposition is served by two shafts, the No. 2 (or western) being distant 3,500 feet from the western boundary, and the No. 1 (or eastern) 1,700 feet distant. The distance between the two shafts is 4,400 feet. It will be evident from the foregoing that the property is of vast extent in so far as distance along the strike is concerned. As to the amount of reef available on the dip, it may be remarked that on a basis of 250 feet of backs, no less than 34 levels will in the course of time be opened up. The exploitation of this vast mine is at present proceeding in accordance with the policy of the majority of the larger Central Mining Corporation deep level areas. Thus the eighth level is being driven right through the property, and will be the first main haulage level in the mine. At lower depths other haulage levels will be driven, and the scheme of working will include the use of these levels as main ore thoroughfares served by mechanical haulage. Ore will be gravitated down to them, and all tramming operations will be concentrated on and along these levels to main hoisting and loading stations. From the west or No. 2 shaft a crosscut is now being driven from a point 2,137 feet below the shaft collar to intersect the reef, about 310 feet south of the company's northern boundary. The total length of this crosscut is estimated to be 1,100 feet. This crosscut is being put in because the original scheme of exploiting the large area between the fifth level and the northern boundary by means of rises and back stoping was found to offer too many difficulties to ventilation and rapid progress. In this portion of the property the No. 5 is at present the top level, and the No. 9 the bottom. Above the seventh level there are, it is estimated, 1,400 feet of backs. The No. 1 or eastern shaft has been sunk 100 feet below the ninth level. It is calculated that reef will be encountered on the 14th level, and this will then become a further main haulage level.

QUESTION OF ORE RESERVES.

The development of the mine to date, it will be gathered from the above, has scarcely in reality commenced. Nevertheless the payable ore reserves at the end of last year, including 136,922 tons contained in shaft pillars, were given at 2,078,805 tons of an average value of 8·1 dwts. per ton, of which 2,063,157 tons were on Main Reef Leader. During 1911, 7,005 feet were driven on reef formation, of which 6,901 feet were on the Main Reef Leader. On the South Reef only 104 feet were driven, the value being 6·7 dwts. over 36 inches. As in the earlier development of the Village Deep, South Reef development to date has presumably been disappointing in this mine. It is particularly noticeable that, in comparison with the preceding year, there is a reduction of 335,759 tons in the payable reserve. This is attributed principally to the fact that in 1911 operations showed that owing to the difficulty of ventilating back stopes a more conservative view has been taken of the workable size of blocks developed above the upper level of the mine. The whole underground position of the property has been greatly hampered by insufficiency and inefficiency of native labour. The position in this regard has improved somewhat of late, and at the time of writing there are about 3,400 natives registered on the books of the company. This complement is still 1,600 or more below the full required complement of the company on the basis of 65,000 tons a month crushing, which the plant is capable of treating.

RESULTS TO DATE.

Before proceeding further, the results of productive operations may be stated, and in presenting the following table it should be remarked that returns have shown progressive improvement almost each month since milling was commenced in December, 1910:—

	Tons Milled.	Stamps at Work.	Revenue. £	Revenue. Per Ton. s.	d.	Working Expenditure. £	Working Expenditure. Per Ton. s.	d.	Working Profit £	Working Profit Per Ton. s.	d.
Year 1911..	349,713	90	537,548	30	9	406,634	23	3	130,914	7	6
Jan. 1912 ..	37,860	110	62,981	32	9	41,690	22	0	19,510	10	4
Feb. 1912...	37,940	110	62,535	32	5	41,981	22	2	18,783	9	11
Mar. 1912 ..	40,030	110	68,163	—		—	20	9	21,230	—	

AN INGENIOUS IDEA.

Special reference must be made to an excellent glass model of the mine to be seen in the drawing office. This has been elaborately fitted up, and although no doubt an expensive representation of the property, it enables one to understand the underground lay-out of the mine far better than by means of any plans. Sheets of glass fixed horizontally in a wooden framing depict different levels, crosscuts, etc., and the course of the shafts is clearly followed. Standing over this very graphic model of the mine one is in the position of an observer possessed of a pair of X-ray eyes, the whole of the mine workings being clearly portrayed beneath.

The Reduction and Cyanide Plants.

The reduction and treatment plants are laid out on a scale of completeness and with a view to permanency for which it would be difficult to find a parallel in mining. In the light of the latest American practice, criticism might perhaps be directed against the extent of ground covered by the plant; but, if it lacks anything in concentration, it should be remembered that the whole equipment has been laid out with a view to expansion, that it has been evolved gradually, and that it has assimilated various new metallurgical and engineering ideas at different periods of design and construction work. The crushing and sorting operations are for the time being concentrated at the No. 2 shaft. In this steel station there are twelve Hadfield crushers, with picking belts and all arrangements for the rapid and economical rejection of waste. Ore is led into bins of a total capacity of 1,000 tons and is drawn off into 40-ton trucks (similar to those employed at Randfontein, Crown Mines and the Main Reef West), drawn by electric locomotives. The doors of the bins are opened and closed by throttles operating compressed air cylinders, the pistons of which act directly on the bin doors, and open or shut them as required. A similar installation is employed at the Crown Mines new sorting plants, but at the City Deep property the 12 crushers are divided into sets of four, one conveyor belt delivering to each set. Reducing gear, supplied by the Power Plant Company, reduces the speed of the motors driving the belts from 475 to 7·9 revolutions per minute. The electric locomotives run up a trestle track and deliver into the mill bins, whence the ore is fed automatically into the 194-stamp battery. This is in point of capacity a 200-stamp mill, there being 190 ordinary Californian gravitation stamps of 2,000 lbs. weight, supplied by Fraser & Chalmers, and four Nissen gravity stamps (made by Head, Wrightson & Co.) of 2,245 lbs. weight, these being the equivalent of a further 10 stamps. It may be recollected that the results of a series of tests carried out some time ago with these latter stamps gave a duty of 37·74 tons per stamp per 24 hours through a ⅜in. mesh screen, the horse power absorbed being ·14 per ton crushed. The stamps are electrically operated in sets of 10 by motors running at 580 revolutions per minute, rated at 14 amperes, and developing a continuous horse power factor of 50. Two meshes of screening are employed in the City Deep battery, " 9 " and " 16." and the average stamp duty is about 14·5 tons per diem. The average crushing duty last year was 13·2 tons, and for the first two months of 1912 duties and stamps running have been:—

	Stamps Running.		Crushing Duty per Stamp per 24 Hours.
January	110	......	13·8
February	110	......	13·96

The mill pulp is elevated to the Caldecott and Bosqui cones for separation before entering the tube mills by Robeson-Davidson tailings pumps. Nine Allis-Chalmers tube mills, each of standard 22ft. 6in. length, are installed, and it is likely that further extension of milling capacity will largely be secured by adding more tube mills more probably than by installing additional stamps. Adjoining the tube mill station is the tube mill motor house. There are here nine motors, supplied by the A.E.G. Company (one to each tube mill), each motor being rated at 362 revolutions per minute, 274 amperes, and 100 continuous horse power. All the actual gold recovery operations are centralised under one roof. On the north side are the tube mill plates, 63 in number (seven to each tube mill), and of stationary type. On the south side are the 36 extractor boxes and the Johnson filter presses. The cyanide plant lies immediately to the south of the extractor house, and here, as in other portions of the plant, reinforced concrete has been used extensively. Some of the settling tanks, in fact, are of solid concrete structure. Sands for the sands treatment tanks are discharged by Blaisdell excavators. Pachuca vats are employed for agitating. The refining department comes under the same roof as the plates and extractor boxes. It is replete with all modern smelting devices, and the equipment here will shortly be enlarged by the addition of a blast furnace for dealing with by-products. Photographs accompanying this article give a general idea of the lay-out and design of the plant.

Finances, Life and General Outlook.

The accounts of the company for last year show a profit of £90,936. Adding to this the balance of working capital brought forward from 1910 (£61,813), a total of £152,749 is arrived at. This sum has been appropriated as follows: Expended on capital account, £117,581; Government profits tax, £5,430; balance carried to balance sheet, £29,738.

The life of the City Deep is obviously a long one. It has been estimated that the ore contents of the Main Reef Leader alone will give from 30,000 to 35,000 tons per claim on an average dip of 38 degrees, and a stoping width of about 4ft. 6in. This estimate ignores South Reef and Main Reef, and there are distinct possibilities as to the use of ore from one at any rate of these ore bodies in the future. Accepting a gross tonnage of 35,000 tons per claim, and allowing for faults and sorting to the extent of 25 per cent., the tonnage existent in the claims would last the present full battery for between thirty and forty years. The results secured to date by this company, with its vast area of mining ground and highly modern plant, must not be regarded as affording a criterion of the results likely to be secured in the near future. We believe that at an early date the City Deep will justify the most sanguine expectations that have been made concerning it.

Randfontein Central.

The process of resampling the various shafts in the Randfontein Central area is being vigorously pushed forward under the supervision of Mr. Colin Ferguson, says the *Rand Daily Mail*. No. 8 shaft, which was shut down recently, was reopened this week, and work is proceeding on what is termed the East Reef. This reef is reported to have given good assays, and other reefs that were being worked from this shaft are being discarded, for the present at least. In fact, mining from this shaft is being conducted on a new system, and the old lines have been abandoned. With the reopening of this shaft, No. 9 has been shut down, and its complement of workers transferred to No. 8. Mr. McMurtrie, the hero of the flooded mine at Doornkop, has been appointed mine captain at No. 8. No. 9 shaft is now being resampled, and it is probable that its shutting down will only be temporary.

City and Suburban.

The report on operations at the City and Suburban for the quarter ended 31st March states that from 79,781 tons milled 34,389.954 ozs. of gold were recovered, the revenue from which was £143,661, and from 6,329.748 ozs. gold reserve added £26,412, making the total for the quarter £170,073. Working expenditure absorbed £86,910, or 21s. 9.445d. per ton, which left a profit for the quarter of £56,752, or 14s. 2.722d. per ton, including the value of the gold reserve, the total profit shown is £83,164. On development work the number of feet driven, sunk, and risen, exclusive of stopes, was 1,734 feet. The reef disclosures were as follows:

	Distance Exposed. feet.	Width. inches.	Assay Value. dwts.
Main Reef	331	35	7.5
Main Reef Leader	616	24	7.2
South Reef	210	21	17.4
Totals and averages ...	1,157	27	8.7

The capital expenditure for the three months amounted to £602.

WINDERS AT THE RAND COLLIERIES.

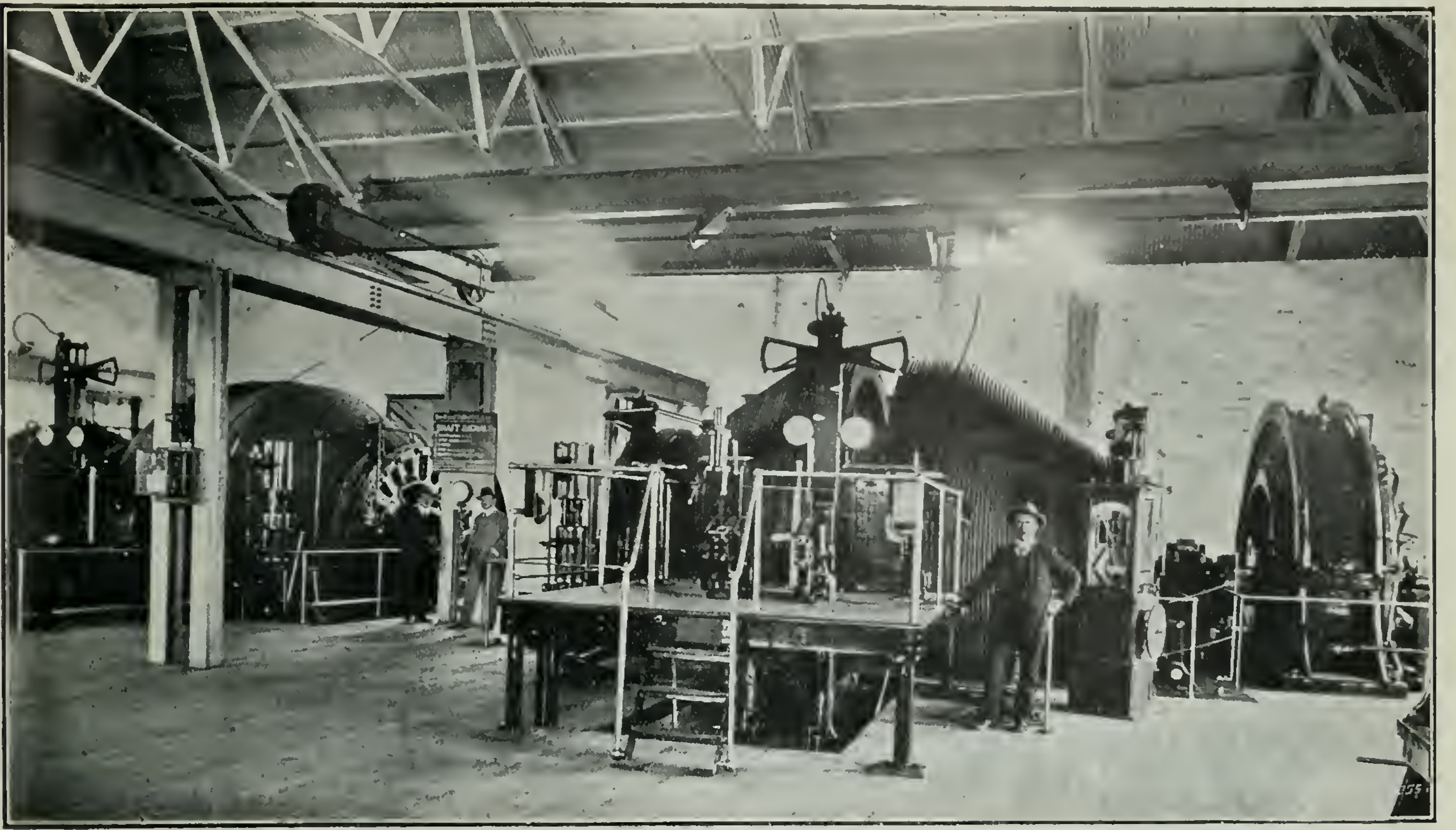
Illustrations of Electrical Progress—Some Interesting Speed and Capacity Figures.

Probably in no other department of mining engineering has greater advance been made of recent years than in the development of electric hoists. Ten years ago Mr. Behr's historical paper on "Hoisting from Great Depths" excited the interest and attention of the technical brains not only of the Rand, but of the mining and engineering world. It may be recalled that in the discussion that followed on Mr. Behr's contribution, Messrs. Hennen Jennings, Robeson, Laschinger, and others brought forward valuable views and suggestions, but a decade ago the development of the high speed electric winder to its present high state of efficiency and safety was not reckoned on in the philosophies of the most progressive engineers. In these days engineering works were unequipped for turning out such large capacity and high speed hoists as are on the market to-day. But the debt the mining industry, and particularly the mining industry of the Rand, owes to Mr. Behr's paper and the discussion of it cannot be exaggerated. Even to-day the designs and schemes of hoisting laid down in Mr. Behr's paper are preserved to a large extent in modern practice. Ten years ago the problem of deep winding was regarded as being likely to prove a great obstacle to very deep mining on the Witwatersrand. But to-day deep winding and stage hoisting are not regarded as being amongst the really troublesome problems of mining engineering. The electrification of the Rand has not only largely abolished the steam engine from mill power stations, it has also substituted the motor for the steam cylinder in hoisting plants. All along the Rand electric winders are at work, or are being installed, and amongst the most modern electric hoisting equipments must be mentioned that at the Rand Collieries, installed under the supervision of the engineering staff of the General Mining and Finance Corporation, a firm that has "plumped" solidly for the extensive adoption of electric power to Rand mining. The Rand Collieries electric winders have been supplied by Messrs. Fraser and Chalmers and Siemens, Ltd., the former firm being responsible for the mechanical portion of the equipment, and the latter the electrical installations. At the No. 1 shaft there are two winders of Ward-Leonard type. One is of three tons and the other of six tons capacity. These hoist from a depth of 2,970 feet at the rate of 3,300 feet per minute, the maximum capacity being 100 tons per hour. The three ton winder takes 108·2 secs. for the trip, and the six-ton 104·2 secs., including the loading in each instance.

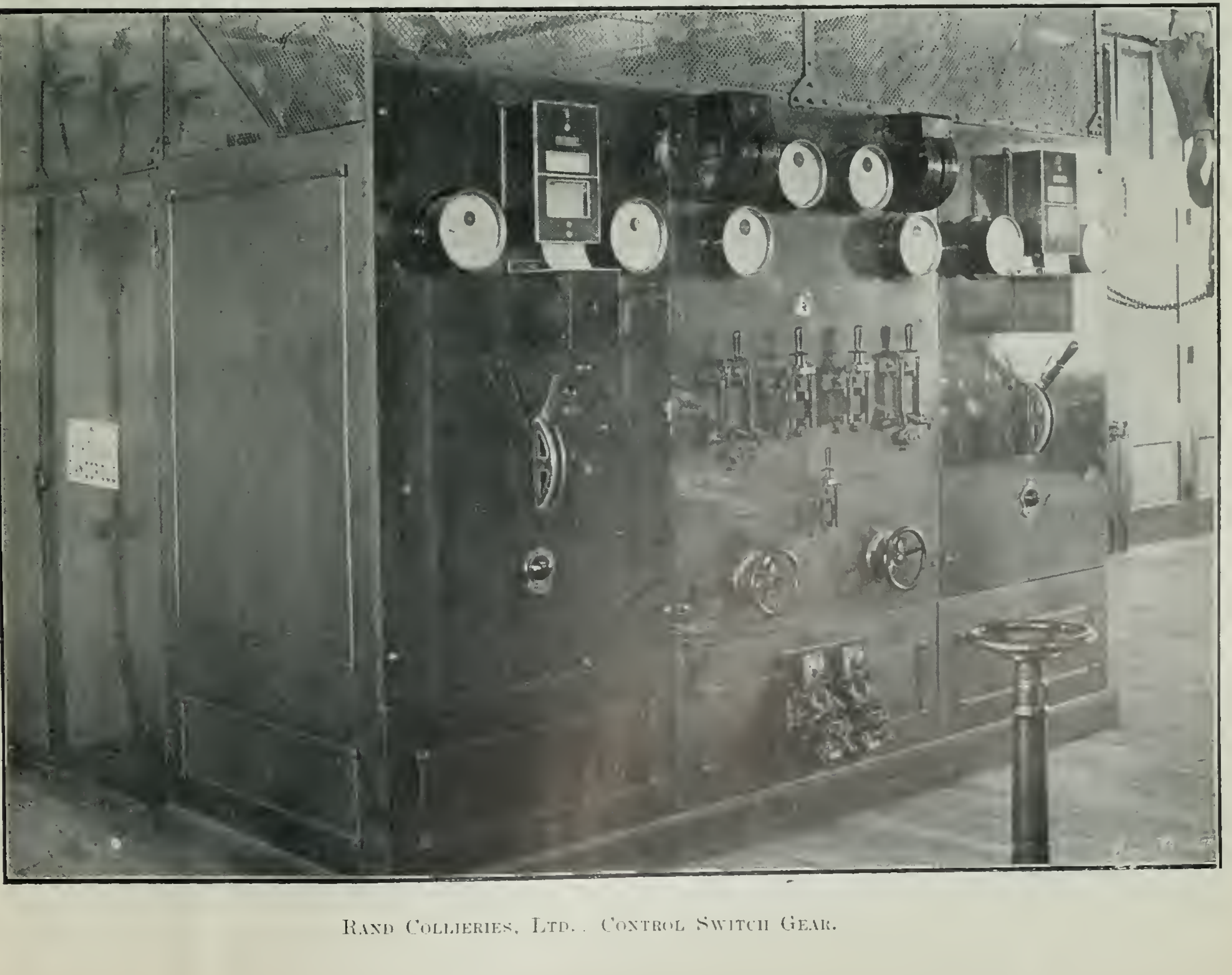
Rand Collieries, Ltd.: No. 1 Shaft.

At the No. 2 shaft one six-ton hoist, also of Ward-Leonard type, has been installed to wind from 3,245 feet, the trip occupying 113·65 secs., including loading.

The three-ton hoist is fitted with cylindro-conical drums of dimensions 8 feet to 15 feet 6 inches. The three-ton load consists of a 2½-ton skip, with rope weighing 2 lbs. per foot. The dimensions of the six-ton winders cylindro-conical drums are 10 feet to 17 ft. 6 ins., with 7,500 lbs. skip and rope weighing 3 lbs. per foot. These are very fine hoisting performances, especially when one takes into consideration the time occupied in loading—30 secs. It is true that the trips, taking into account hoisting depths, do not compare too favourably with achievements at De Beers Consolidated Mines, but it should be remembered that at Kimberley loading takes very much less time than on the Rand. The Kimberley blue ground slips into the skips much more rapidly than Witwatersrand banket. In point of actual speed of hoisting, the

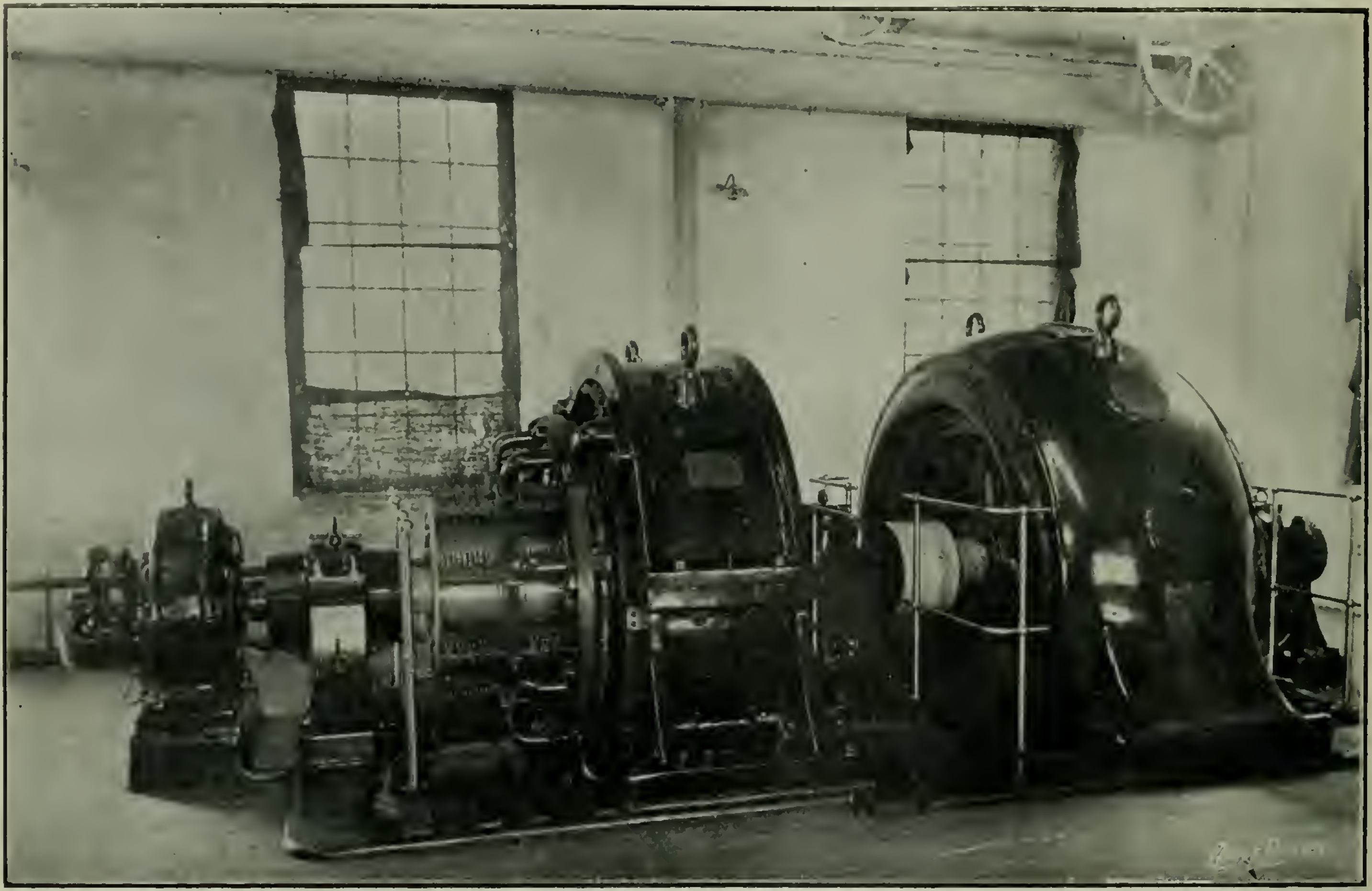


Rand Collieries, Ltd.; The Electric Winders.



Rand Collieries, Ltd.. Control Switch Gear.

Rand Collieries winders will compare most favourably with the best De Beers hoisting records. Whilst we do not wish to intrude on the realms of discussion as to the relative merits and demerits of the different types of winders on the Rand, we may remark that it is claimed for these Rand Collieries Ward-Leonard winders that a degree of safety is obtainable there which cannot be procured with the three-phase type. In fact, the Rand Collieries winders are said to be accident proof. Whilst the first cost of the Ward-Leonard type is probably 30 per cent. higher than that of the three-phase winders, it is contended that costs of operation are sensibly lower. The accompanying photographs, for which we are indebted to Messrs. Siemens, Ltd., give one a good idea of the general lay-out of the plant.



Rand Collieries: 6-ton Convertor as Installed at Both Shafts.

Latest from the Diamond Diggings.

The diamond returns for March from the different diggings of the south-western districts show a total exceeding that of any previous month, and amount to 7,760½ carats, value £36,702 6s. 9d. Bloemhof has returned to the position of premier producer, and supplants Mooifontein, which has been in the lead for several months past. Bloemhof shows 3,018¾ carats, value £13,044 13s., which was made up of 482 separate returns, the best among which were valued respectively at £1,061, £400, £377, £328, £256, £225, £192, £162, £153 and £152. The biggest diamond was one of 129½ carats, valued at £1,060 (which was referred to at the time of its discovery as being the largest found in any Transvaal alluvial digging). Weltevreden retains third place among the producers, and its 65 separate returns, totalling 718 carats, value £3,429 19s. 6d., included 11 returns exceeding £100, viz.: £713, £355, £242, £152, £147, £142, £135, £133, £129, £122 and £116. One parcel of three diamonds, weighing 69¼ carats, was valued at £260, another of two diamonds (30 carats) at £158, and other good finds were: 7¾ carats, value £124; 13½ carats, £117; 12 carats, £113; 8¼ carats, £107; and 17 carats, £95. London comes next with 289¾ carats, value £2,081 0s. 3d. These were made up of 48 separate returns, the best being £374, £235, £109, £105 and £100. The best stones found were: 14½ carats, value £215; 16 carats, £160; and 10 carats, £110. Avondster shows 313½ carats, value £1,608 16s., and Pantontein 325 carats, value £1,256 2s. 6d., in each case only one return being made. Goedgenoeg with 29 returns showed 92¾ carats, value £818 15s., which included a 13¾ carat stone value £190, and another of 9½ carats value £120. Modderkraal, with 16 returns, was responsible for 80¼ carats, value £179, one stone of 10¼ carats being valued at £75 10s. Grootdoorns returned 60½ carats, value £400 15s.; Zoutpan, 62¼ carats, value £318 2s. 6d.; Blesbokfontein, 55 carats, value £210 19s.; Verlatenkraal, 18¾ carats, value £172 5s.; and Christiana, 13¾ carats, value £110 15s. (which included one stone of 10½ carats, value £91). Ten other localities reported finds of less than £100, these being as follows: Boschpan, 19½ carats, value £77 15s.; Doornbult, 10 carats, value £41 10s.; Kingston, 5½ carats, value £40; Kromellenboog, 6¼ carats, value £31 5s.; Diamantfontein, 3½ carats, value £16; Boschkop, 4 carats, value £16; Schoongezicht, 2½ carats, value £12; Koksrust, 2½ carats, value £6; Pienaarsfontein, 1¼ carats, value £5; and Cawood's Hope, ½ carat, value 15s. A number of late returns for February were also reported, the most important among which were: Avondster, 314¾ carats, value £1,756 15s.; Mooifontein, 147 carats, value £711 5s.; and Bloemhof, 40¼ carats, value £127 10s. With the late returns (altogether 529¾ carats, value £2,734 19s. 6d.), February's aggregate has been increased to 6,999¾ carats, value £32,816 17s 6d.

AN EXPERIMENTAL STATION FOR THE RAND.

The Daylight Investigation of the Dust Problem—Coal-dust Explosion Galleries Abroad—The Advantages of Proper Facilities for Enquiry.

Among the somewhat numerous schemes which have been proposed or carried into effect for the suppression of the underground dust evil, and the consequent elimination of miners' phthisis, none has yet been suggested, as far as we are aware, for the systematic carrying out of experimental investigations. If the efforts of the mining houses and the intentions of the Government are to be productive of any substantial improvement in the conditions of the working places of the Rand it is obvious that a very great deal of this kind of enquiry will have to be undertaken. There has been a good deal of it already, of course, for dust arrestors, sprays, and breathing apparatus of various types have been tried persistently and honestly at one mine or another for many months past, but there has been no properly organised or, as we have termed it above, systematic trial of these contrivances on behalf of the industry as a whole. The necessity for some provision being made in this direction is a point, we think, that hardly requires to be enlarged upon. It is a matter, however, which is capable of easy solution. The primary requirement in connection with the systematic investigations which should be made with regard to dust and its prevention is an experimental station where all the conditions which surround the origin, character, and effective treatment of this dangerous material may be studied in detail, and more or less exhaustively, without any of the disadvantages which are attendant upon an underground examination.

An Underground Demonstration.

The practical demonstration of the merits of a well-known dust arrestor, which was carried out at a mine not far from town, occurs to us at the moment. After a great deal of trouble and time had been taken at the store, and afterwards in the drill repairing shop at the surface, to ensure the suitability of the necessary fittings, a move was made down the shaft. On arrival at the face of the drive where the demonstration was to take place it was found that the occasion was not altogether as convenient as was expected, and considerable delay occurred before the apparatus could be put into place. Then, for some reason or another, things went wrong with a machine, and, simultaneously with the starting of an intermittent and rather violent shower-bath, the lights went out, and the demonstration was carried on, with some difficulty, apparently, to judge from the struggling and pushing that ensued, but without any useful result whatever. With one's mouth, ears, and eyes assailed with a dirty spray, ejected with great force, it was impossible to form any opinion as to the effect of the arrestor upon the dust at the drill hole. When it is added that there were two machines running at once, although only one was necessary for our purpose, it will be admitted that it would have been waste of valuable time to attend the exhibition any longer. As a matter of fact, it was concluded a few minutes afterwards, and, having received the assurance of those chiefly concerned that it was, considering everything, a success, we retired. This is, no doubt, an exaggerated picture of the conditions that prevail at many of these tests, but it will serve to draw attention to the fact that, although practical experiments may be made underground, they are usually made under some disadvantageous condition or another. The most serious of these obstacles to enquiry is probably the want of suitable light, and this defect, as well as most of the others that will readily suggest themselves, might be overcome by the erection of a properly constructed and arranged gallery or other chamber at the surface.

The Altofts and other Galleries.

It was in consequence of the danger of firing shots in dusty main intakes in coal mines, and of the verdict after the Altofts Colliery explosion (which occurred when the Royal Commission was sitting in 1886), that the law was passed requiring the watering of dust, with the alternative of using a flameless explosive or one protected with water. The most conclusive evidence of a coal-dust explosion of any magnitude in a mine was given in the case of the enquiry after the Altofts disaster, and as a result of the evidence which was gradually accumulated with regard to the dangers of coal-dust, the experimental gallery at Altofts was constructed at great expense for the purpose of making a practical enquiry into the subject under proper conditions. The impossibility of carrying out explosive tests in a satisfactory way underground was, of course, the primary idea which underlay the scheme of surface experiments at Altofts and elsewhere, but the information obtained from them has been of the most useful and reliable kind, and, probably, the more clear and convincing because of the facilities offered for close observation. The sensational phenomena produced at the experiments made at Altofts and Liévin, the latter a French station, together with the evidence obtained after the great Courrières explosion, are said to have removed misconceptions from the minds of French engineers which had persisted for thirty-one years after they had been strongly argued against in 1875. The Courrières disaster in 1906, in which over 1,100 men perished, brought the coal-dust question into prominence, and Commissions and Committees were hastily called together or revived, thousands of pounds were forthcoming for experiments, apparatus on a comparatively gigantic scale was erected in England, France and the United States, and experiments were resumed in an artificial gallery that in Austria had been disused for several years. In 1907 there occurred in America a series of appalling colliery explosions, and in 1908 Congress was induced to vote a sum of money for the investigation of this kind of disaster, the result being the opening in the same year of the Pittsburg testing station. The solid structure of the various galleries mentioned may be inferred from the fact that pressures of over 100 lbs. per square inch have been registered in them.

Experiments by Daylight.

The structural features of a gallery in which the production and transportation of dust, together with the character and prevalence of poisonous gases, and the effects of dust arrestors and ventilating appliances, could be conveniently observed would be somewhat similar to those in which coal-dust investigations are made. It would be possible to examine the working of protective and preventive methods with proper scientific calmness in the broad light of day, instead of in the murky gloom of a filthy and incommodious drive, and there would be no question of hindering work or difficulty of manipulating the necessary tests. With the assistance of a committee of technical experts, the facilities afforded by such an experimental station would be more reliable and convincing, and more calculated to attract attention than the rough and ready and insufficiently authenticated experiments that are often discussed at the meetings of technical societies. The absence of scientific weight, which seems to characterise much of the testimony of those who have good evidence to offer, stands greatly in the way of a fair handling of the dust problem, and the establishment of such an adequate and unassailable method of enquiry as we have advocated in this article should go far to solve the most important problem which faces the industry to-day.

Indians for German South-West.

The Chamber of Mines at Luderitzbucht has decided to import 1,000 Indians for the diamond fields, owing to the shortage of local labour.

THE TIN FIELDS.

The Geology of Tin Pipes—Rooiberg New Plant in Action—Valuation of Tin Ores.

An interesting announcement in connection with Zaaiplaats is that the company has acquired certain rights over adjoining ground from the Transvaal Consolidated Lands Company. We understand that the ground referred to lies adjacent to the Roodepoort or south-eastern boundary, including that near the opening of the No. 13 pipe, from which the Corner House Company obtained a fair amount of good ore up to the edge of the Zaaiplaats boundary. The object of the recent agreement has been that more convenient access might be obtained by the Zaaiplaats people to certain pipes which have their origin in the neighbouring ground and dip towards the mine area at an angle which would scarcely justify any great expenditure by the Transvaal Consolidated Lands Company for exploitation purposes. By the new arrangement the pipes will be worked by the Zaaiplaats Company, who, as consideration, will hand over a certain proportion of the ore extracted to the T.C.L. Company for treatment at their own mill. This process will only continue, of course, until the common boundary is passed, when the whole ore won will be the property of the Zaaiplaats Company, free entry to the workings being permitted.

Some misunderstanding seems to have arisen from the statements of Mr. Jeppe at the meeting of the African Farms and those contained in the recent T.C.L. report, with regard to the proximity of the Zaaiplaats pipe workings to the adjoining area. The Nos. 5 and 6 pipes are admittedly within 500 feet or so of the boundary, but are so irregular in their trend that no reliable conclusion seems possible as to their future course. The mere evidence of present position is a factor of quite uncertain value in deciding what will be the probable position after another 500 feet of development. The No. 13 pipe, although it has run more or less parallel with the north-eastern boundary, and within a distance of 500 feet or so from it, since the commencement of operations, is still about a thousand feet distant from the north-western boundary in the direction of what may be called its strike. The same remarks may be applied to its probable position at the end of another 1,000 feet of development as have been made with reference to the future course of the Nos. 5 and 6 pipes. Those who have studied the geological structure of all these pipes will understand that although they do without doubt follow planes of fissure, their actual course is influenced by the fact that there are several sets of fissure planes intersecting each other in different directions. The pipes in their progress may, and do as a matter of fact, follow one plane in preference to another, without prejudice, as the lawyers say, and what happens to-day, therefore, is no certain criterion of what is going to happen to-morrow. Sufficient comfort for the shareholders lies in the strong appearance of the ore bodies in the various workings and the substantial ore reserve assets, which have been well maintained in spite of the increased demand made by the mill. It is gratifying to learn that Mr. W. J. Gau, of the Farrar group, has joined the Zaaiplaats board.

ROOIBERG.

The new milling and dressing plant at Rooiberg has been completed, and is being put through the usual preliminary tests. It will probably be in full running order by the end of the month.

VALUATION OF TIN ORES.

In our issues of July 1st and July 8th last year we dealt at length with the somewhat confused question of the valuation of tin ores, the subject having arisen to some extent in consequence of Mr. C. Fred Thomas's remarks upon the subject in his paper, "Notes on Tin," which was read before a meeting of the Chemical, Metallurgical and Mining Society. Dr. Steinhart, Ph.D., M.I.M.M., T.C.S., took occasion to write some interesting comments upon the points discussed, and in a recent issue of the *Mining Magazine* has again referred to the matter as follows:—

> Those having to deal with the mining, smelting, and marketing of tin ores were naturally interested in the article which appeared in the January issue of the magazine, headed "Selling Tin Concentrate," and referring to Cornish practice. That a reform is desirable is obvious, but, on the other hand, the peculiar conditions prevailing in Cornwall as to the sale of tin ores must be taken into consideration. The industry is an ancient one, and old customs are still predominant. To begin with, the "draftage" of 3lb. for every cwt. of concentrate sold, demanded by the Cornish smelters, is the outcome of an old custom. At times, when the ore was being weighed, the "turn of the scales" was disputed, and apparently the buyer ultimately got the better of the miner, by demanding 115 lb. in lieu of 112 lb. Concentrate in Cornwall is sold wet, in which state the samples are taken and assayed, and a bid is made for the material in this condition. This, no doubt, is an undesirable practice for more than one reason, especially as it is well known that cases have occurred where water has been poured over the concentrate prior to disposal, in order to make weight. Producers who make a habit of this unfair practice will soon find, to their cost, that the smelter will remember it against them. I had occasion to go into this question of the valuation of tin concentrate last year, and give herewith some of the data collected:—
>
> (1) *Cornish Smelters' Charges.*—Including the 3 lb. allowance per 112 lb. demanded by the smelters, the total smelters' charges per ton of concentrate assaying, say, 65 per cent. Sn, amounts in round figures to £10. This charge necessarily varies slightly, as the buying of tin concentrate by the smelters at the ticketings is a competitive one; but it will be found that from £9 to £11 per ton generally covers the charges.
>
> (2) *Continental Smelters' Charges.*—As an example, I give the following price obtained in May, 1908 for a concentrate assaying 71.4 per cent. Sn. dry assay, with the metal at £140 2s. 8d. The Continental smelter paid 181.11 marks per 100 kilogrammes of concentrate, and as £140 2s. 8d. per ton equals 280.27 marks per 100 kg. of metal, the smelting charge amounted to £9 10s. per ton of concentrate. This is somewhat lower than Cornish charges, but as the ore was high grade and pure, probably the Cornish charges would have been approximately the same. Another smelter recently charged £12 per ton for concentrate containing about 67 per cent. Sn. The tin contents were paid for in full, the basis of the valuation being the average lowest price of either cash or three months tin, during the week following the arrival of the mineral. In this case, cash was paid, whereas in the previous example a three months' bill for value was given.
>
> (3) *Australian Smelters' Charges.*—The Mount Bischoff Company (Tasmania), which undertakes custom smelting besides treating its own concentrate, makes, so I understand, the following charge: Smelting charge, £3 per ton, and a deduction of 2 per cent. from the assay to cover smelting losses. Thus for a 72 per cent. concentrate they return 70 per cent. tin, or 14 cwt. of metal per ton of mineral. A heavier deduction is made for concentrate under 70 per cent. It must be observed, however, that this low total charge of under £7 per ton with tin at £190, is due to the great purity of the Tasmanian ores.
>
> (4) *Straits Settlements Smelters' Charges.*—As far as I can gather, the following is the charge made by the Straits Trading Company at Pulo Brani, which company handles by far the greater portion of the concentrate from the Malay Peninsula. The total deduction for concentrate assaying 70 per cent. Sn is about 2½ per cent., and proportionately more for mineral a lower grade; for instance, with 65 to 67.5 per cent. material, 4 per cent. is deducted. From the weight of the dry concentrate in conjunction with the reduced assay-value thus obtained, the weight of metallic tin is calculated, and is paid for in cash at current rates, less a returning charge of from £2 10s. to £3 per ton of ore. These figures are only approximate. Mr. H. D. Griffiths, manager of the Tronoh mine, gave more details concerning Malay smelting charges, in the *Mining Journal* of June 10, 1911, which may be summarised in the following lines:—With an ore assaying 75.6 per cent. metallic tin, and including a deduction of 2.6 per cent. smelting loss, the total smelting charge is: with tin at £156 6s. per ton, £8 12s. 11d. per ton; at £176 8s. per ton, £9 2s. per ton; at £196 per ton, £9 13s. 3d. per ton. In the case of lower-grade concentrate assaying about 68 per cent. and with tin at £176 8s. per ton, a deduction of 3.2 units is made, and the total smelting charge in such a case would vary from £10 1s. to £11 6s. 10d. per ton. In looking at the various charges one point must not be overlooked, that is, the cost of carriage of the concentrate, which may considerably modify the actual amount obtained by the mines. Naturally, in comparing the smelting charges obtaining in different parts of the world, it must be remembered that the price realised for concentrate depends, apart from the percentage of metal upon the absence of deleterious minerals and elements, such as sulphur, arsenic, wolfram, titanium, magnetite, etc. As will be seen from the above, England is apparently the only country where tin ore and concentrate is sold without stating the actual tin content of the concentrate purchased. It is to be hoped that the day is not far distant when this obsolete and undesirable method of procedure will be relegated to the past. In all fairness, however, to the Cornish methods of selling tin ores, it must be borne in mind, that even with the present system, the smelter does not materially underpay the mine owner when comparison is made with the procedure in other countries. This was shown on one occasion when an important Continental smelter endeavoured to purchase tin concentrate in Cornwall, but failed because his offer was not so favourable as the local one.

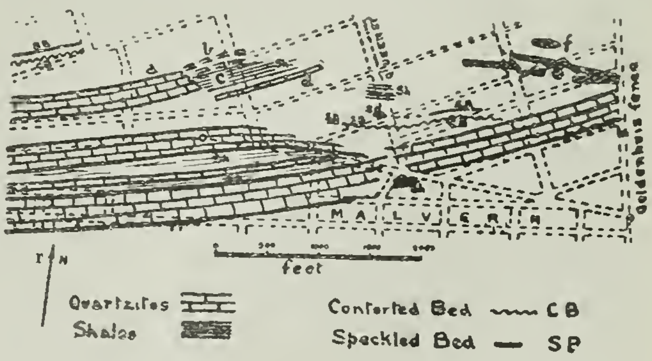
THE GEOLOGY OF THE WITWATERSRAND.—II.

The Value of Definite Criticism—The Fault West of the Geldenhuis Mill—The Geological Survey and "The New Geology."

THE following is the remaining portion of Dr. Mellor's very lucid and instructive reply to the various criticisms which have been made with reference to his views on "The Geology of the Lower Witwatersrand System" on the Central Rand. The preceding portion was published in our issue of last week:—

Mr. Olver's mention of the fact that one of the maps in his book is largely taken from mine is perhaps apt, unintentionally, to convey the impression that some of the main features there shown represent my views, which of course is not the case, particularly with regard to the identification and extension of the various quartzites, and a comparison of the maps should be made. Mr. Olver's correlation of the Coronation shale, west of Maraisburg with the Contorted Bed, and his consequent identification of the Coronation quartzite as the Hospital Hill quartzite, are of course the basis of his reading of the geology of the whole of the country to the west, including the Witpoortje section, and influence his conception of the behaviour of the faults in that district. With the reading adopted by Mr. Olver I am in total disagreement. With regard to the Rietfontein series, my position has been stated in my reply to Mr. Horwood (p. 1.). As mentioned in my first paper, I hope to be able to take up this question more fully should an opportunity occur of dealing more completely with it in conjunction with the adjacent areas, a thorough study of which I consider to be essential for the solution of the problem. Rietfontein lies near the extremity of the district with which I may claim to be intimately acquainted, and my work for some time has lain in a more westerly direction. I see no great improbability, however, in the view advocated by Mr. Olver that the Rietfontein area may include (among other elements) a faulted portion of the Main Reef series. At the same time I certainly see no striking similarity between the Rietfontein reefs and the nearest occurrences of the Main Reef series, and especially between the South Rietfontein reefs and the Bird Reefs, which Mr. Olver makes a strong point in his correlation. And when it is further necessary to assume a six-mile thrust westwards along a fault line in order to explain the similarity of the Rietfontein reefs to those of the Eastern Rand, more evidence than that offered by Mr. Olver seems to be required.

Mr. Bleloch's views with regard to the geology of the district under discussion have been given in the treatise to which he refers. From the summary of conclusions given in that treatise, it is clear, so far as the district with which my paper deals is concerned, that among Mr. Bleloch's main points are the following:—That there is no duplication of the Hospital Hill series in the Bezuidenhout Valley, that the Langerman's Kop beds are to be regarded as a conformable series in the Lower Witwatersrand system, and that this series is to be found at a corresponding horizon throughout the Rand. It will be seen that these are the identical propositions which have been restated by Mr. Horwood in his discussion, to which I have already replied. It is therefore scarcely necessary again to point out that on all these fundamental questions my conclusions are diametrically opposed to those of Mr. Bleloch. A comparison of the maps accompanying my papers with Mr. Bleloch's representation of the same areas will further emphasise this difference of opinion., Mr. Bleloch mentions instances in which he appears to think that I may have put forward without acknowledgment, as new facts, points already on record. Should this be so it is a matter of regret to me. I can assure him, however, that in the instances he refers to, I was far from regarding my references as new. They appeared to me to be plain statements of obvious facts already very generally known for many years. The persistence of the Government Reef series through the Central Rand, for example, has been maintained by many engineers and geologists since the early days of the field. That this was not regarded in any way in the light of a "discovery" is sufficiently plain from the context to the reference to this series in my first paper,† where it was stated that the series was well known to many local engineers and geologists, although apparently overlooked by the authors to whose views reference was there made. It seems to me, however, that my work had been instrumental in bringing out clearly the relationships of this series to the rest of the Lower Witwatersrand system, and in giving an explanation as to why the Central Rand section should apparently differ so widely from sections in the East and West. Reference to Mr. Bleloch's description and to his maps, particularly the smaller ones illustrating his treatise, shows that Mr. Bleloch's Market-Square-Fairview series, which he states is the equivalent of my Government Reef series, embraces not only the latter but in addition, what I would include under the term Hospital Hill beds, and also the whole of "Jeppestown Series" as well, that is to say, all the beds from the "Speckled Bed" to the Main Reef Series. My use of the term Government Reef Series, as shown in the sections accompanying my paper, was limited to less than half the beds just mentioned. Without clear definition of the terms used, discussion is rendered very difficult, and I suggest that it would be of considerable assistance to those who endeavour to follow this and similar discussions if all who take part in them would define more clearly the various beds and series as they understand them, and give some approximate estimate of their thicknesses in various places. It sometimes happens in these discussions that such beds and series appear to be so elastic, so elusive, and so variable in their different appearance, and the localities in which they occur are so vaguely indicated, that it is exceedingly difficult either to verify or dispose of the statements made with regard to them, and this has always been one of the most fruitful sources of disagreement in all geological discussions. With regard to the faulting to the west of the Geldenhuis mill, Mr. Beloch illustrates his point by means of a diagram, a course which might be followed more frequently in dealing with geological subjects. Anyone interested in the point in question may easily make a similar plan for comparison. In this instance, the work can be much more facilitated by using as a basis for plotting, the street lines, which have been laid out on the ground and whose correct relative position may be obtained from the Johannesburg township plan. These street lines and their intersections will be found of the greatest use in plotting the correct position and direction of strike and dip of the various outcrops, and this will obviate the use of the compass, which I have found exceedingly misleading in localities occupied by Lower Witwatersrand beds on account of the very ferruginous character of some of the shales. I would suggest that the outcrop of the contorted bed as shown in my map be carefully compared with the beds with which Mr. Bleloch regards them as being continuous, and also with the outcrops of the contorted bed along the northern foot of the quartzite ridge further west, and that the thickness, number and character of the quartzites west of the fault indicated on my map be compared with those on the east. The question as to whether the appearance of many of these beds and of the whole area suggests the effects of severe faulting or, on the other hand, indicates comparatively undisturbed conditions, as maintained by Mr. Bleloch, might also receive attention, particularly the way in which the prominent outcrop of green quartzites (Hospital Hill quartzites) terminates suddenly and gives place to shales which lie directly in the continued line of strike of the quartzites. The thickness and character of the quartzites which are supposed to represent the continuation of the green quartzites should also be noted. Most observers who are able to spend sufficient time to secure accuracy, will probably produce plans indicating even more faulting than does mine, from which much of the detail shown in my larger scale maps has necessarily been omitted, and they will probably find that such plans will require somewhat drastic treatment before they can be reduced to the simple form indicated in Mr. Bleloch's sketch. The more prominent outcrops to be seen in this locality are shown as nearly as possible in their true relationships and dimensions in the accompanying figure, taken from my field map, from which it will be seen that the want of continuity in all the big quartzites is obvious, without the removal of the surface drift that covers a small part of the area, and that the existence of a transverse fault as shown on the map accompanying my paper is exceedingly clear.



a. Massive greenish quartzites, thickness over 250 feet, striking directly against the shales c.
b. Broken quartzites alternating with soft, sandy shales.
c. Shales in direct line of strike of the quartzites a.
d. Small quartzite thickness approximately 20 feet.
e. Small quartzites, thickness approximately 20 feet, with shales above and below. At eastern end form a double or narrow V-shaped outcrop with shale between.
f. Big pebble conglomerate.

This small area may also be taken as a very good example of the conditions constantly met with along the course of the main line of faulting, described in my papers under the name of the Rietfontein Fault, and it will be seen that many minor faults are naturally to be expected in such exceedingly broken country.

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†Trans. Geol. Soc., S.A., vol. xiv., p. 26.

Were it not a matter of general experience, in connection with geological as well as other problems, that it is often the most important points which are passed over in silence when these present any special difficulty, it would be a matter of surprise that some of the most striking features in local geology have not been published, while others of much less importance have been treated in great detail. Both Mr. Bleloch and Mr. Horwood give attention to the discussion of minor faults in the Kensington Ridge, but make no reference whatever to some of the most important structural features exhibited by the district as a whole, as, for example, the vertical and overtilted dips shown by the beds immediately north of the line of the Rietfontein Fault, from Rietfontein on the east to beyond Witpoortje on the west. Other points of similar first-rate importance and equally capable of easy verification are the occurrences of granite along the same line to the south and west of the Rietfontein mines, the northward dipping beds of a large part of Langerman's Kop described in my first paper, the evidence of unconformity presented by the same locality,‡ and many other similar occurrences. These would, I think, appear to most geologists of such significance that a satisfactory explanation of them should be the first care of those who deny the existence of longitudinal faulting on a large scale in the Bezuidenhout Valley, and who wish to establish on a firm basis the view that the Langerman's Kop Beds are normally interbedded in the Lower Witwatersrand System.

In considering the subject of faulting on the Rand, many geologists and engineers are probably influenced by their knowledge of the Main Reef series. Although in a mining sense the reefs are everywhere very much faulted, they are, on the Central Rand, remarkably free from the effects of large structural faults such as to be found in the Lower Witwatersrand System. This does not appear very remarkable when we consider that the Main Reef series forms part of a big body of very compact quartzites some thousands of feet in thickness, interrupted only by the Kimberley Shales, themselves a very solid body. Thus the whole Upper Witwatersrand System must be regarded as a mass which would offer very great resistance as a whole to outside forces. The Lower Witwatersrand System, on the contrary, is made up of alternating bands of quartzites and shales which are capable of much less resistance, and which lie between the great body of quartzites just referred to and the mass of older granite to the north. It seems only natural that the effects of any large movements which have taken place in the district should be shown much more extensively by the associated quartzites and shales than by the solid mass of quartzites above them, and that the former should have borne the brunt of the resulting dislocations. It is, however, worthy of note that the overtilting of the Lower Witwatersrand beds shown in Figures 1, 3, and 4 in my paper is reflected in the high dips prevailing in the Main Reef series over a corresponding area, and that the very general occurrence of reversed strike faults in the Main Reef series in this district agree with the explanation I have suggested of the movements which have occurred in the Central Rand. With reference to the specimens of the beds underlying the Coronation Reef exhibited by Mr. Bleloch, they seem to me to confirm very closely my description of the beds at this horizon as being specially characterised by a tendency to show within a very short vertical range all intermediate conditions between grits and shales,§ and I think that anyone who will examine the sections for themselves will find that in *any one* of the localities referred to, any of the three types of rock described may be found among the footwall beds of the Coronation Reef. I should like to urge those who are sufficiently interested in the question not to be content with the inspection of samples alone, but wherever possible to rely more on a close and full examination of good and extensive outcrops, followed where possible for some distance along the strike and examined across their whole width; and further, if samples are taken and compared, to endeavour to see to what extent *dissimilar* samples can be obtained from outcrops in the *same* beds, as well as what *similar* samples can be obtained from *different* beds. The more one sees of the possible variations to be met with in closely adjacent portions of the same beds and Series, the less one is disposed to rely on specimens alone for their identification, and to look to a close comparison, not only of individual beds, but also of series, especially as seen in the continuous exposures along the strike, for a solution of the difficulties of correlation.

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‡ Trans. Geol. Soc., S.A., vol. xiv., pp. 34-37.

§ Trans. Geol. Soc., S.A., vol. xiv., p. 106.

LATEST FROM THE PILGRIMS REST GOLDFIELDS.

Progress of Several Properties Reviewed.

[From our Correspondent.]

An interesting venture is Mr. W. P. Taylor's ground, adjoining the claims worked by the R. Burnham Syndicate and the Little Octopus, and in the line from the Jubilee Mine of the T.G.M.E. Prospecting adits have been pushed in from all sides to test the shale reefs, and these are proved payable. The chloritic reef above this carries payable, as does the overburden, which has some alluvial deposit right up to grassroots.

The Townships Selection Committee arrive here to-day, April 18th, to approve of the sites at Graskop and Sabie. The proclamation of the former and the coming of the rail will prove of great service to the district.

Peach Tree is arousing interest just now owing to the development on the Wilson Block, adjoining the famous Peach Tree Mine, which is the richest gold producer of the Central Mines. The vertical shaft is down 120 feet, and the next 15 feet or so should reveal the Theta reef, in a richer body, it is hoped, on the company's ground. Peggings hold all the adjacent ground, even the deeper levels being pegged by the company, showing they think well of it. Water difficulties have prevented work to a great extent.

The Lower Sandstones at Sabie, and stretching right through the district to Mount Retief's, are worthy of attention by some of the richer companies and syndicates.

The T.G.M.E. have struck a rich pocket of ore at Broken Hill.

The G.H.L. Syndicate at Spitzkop are going ahead very hopefully.

Mr. Munro and Capt. Cornwall arrived back on Monday from their trip to town to buy the plant for the C.B.M. Syndicate. This is to be installed at Ledouphine, where some valuable work has been carried out.

The Welcome pneumatic stamp will be watched with interest, as there are those who think the ore here is not hard enough for such a type of mill.

The railway survey will be completed in a week or so, but there are many, too many, delays on the other side beyond Sabie.

Natives and Liquor.

The Heidelberg "News" comments in strong terms on the growing illicit liquor traffic at the Nigel. "The state of affairs at the Nigel revealed by conversation with residents is very unsatisfactory," says the paper. "A systematic and extensive trade in liquor is being carried on with impunity. There may be two opinions regarding the wisdom of permittting the sale of intoxicants to white men, but we should imagine that it would be difficult to find any disinterested person who would argue in favour of placing them within reach of natives. Yet for the sake of fifty lucre plenty of the white men are to be found unscrupulous enough to engage in the wisely prohibited traffic."

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

KOLMANSKOP DIAMOND MINES.

Some Interesting Details from the Annual Report of the General Manager.

The following report by the General Manager was submitted to shareholders of the Kolmanskop Diamonds, at the third annual general meeting, held on Friday, 29th March, at Capetown :—

The mining operations of the Company were this year conducted with little variation at the same places as in the preceding year. Work was, however, commenced in the main valley of the "Buschtal" and a portion of the Kolmanskop mountain. The average number of workmen this year amounted to 39 Europeans and 393 natives. In the second half of the year a shortage of labour occurred which continued to the end of the year, so that during this period there was an average deficiency of a quarter to a third of the necessary number. The production was very much influenced by this as the work had repeatedly to be done in localities which were conveniently situated without considering the value of the sand. During the year there were worked : About 450,000 loads 225,000 ch. m. mined (estimated); about 150,539 loads 752.655 ch. m. washed (measured). The output amounted to 117.234¾ carats, which gives average monthly production of 12,270 carats. After the installation of the second and third Schiechel machines had been completed (the first machine having been in work since the middle of December of last year) only from three to five hand machines were kept in use at such places as were not favourably situated for work by the Schiechel machines, but were easily accessible to the tramline. In the neighbourhood of machine No. 1, work was done at greater depth (1½ to 2m) with satisfactory results—about 1 carat per load washed—in the months in which the weather least affected this work, while at the other machines one had very frequently to fall back on the debris heaps which had already been worked through by hand machine, owing to the shortage in the necessary number of labourers. The output from these heaps was necessarily far less than it would have been from virgin ground. However, out of some 60,000 loads of debris sand approximately an additional 10.000 carats have been won this year, while approximately 30.000 loads of fresh sand yielded about 35,000 carats. The new ground to which operations were extended was about 30 hectares at Kolmanskop Mountain and 40 hectares in the Buschtal. The general view of the areas over which mining operations have been extended presented itself on the 31st day of December, 1911, as follows :—Entirely worked out, 1909, 30 ha, 1910 36 ha, 1911 44 ha, total 110 ha; partly worked out (surface layers) 1909 28 ha, 1910 45 ha, 1911 70 ha, total, 143 ha; unworked (out of ground prospected), 1909 900 ha, 1910 864 ha, 1911 820 ha, total 820 ha. Prospecting operations could only be kept up during the first 8½ months (January to September) as for the remaining months there was a deficiency of labour. In this year chiefly the "Annental" has been opened up and the "East Slope" has shown itself throughout diamond bearing and profitable to mine. The prospecting work extended over an area of about 300 hectares (including round the saddle of the Kolmanskop Mountain), and confirms a profitable mining area, as indicated in the annual report of 1909, of approximately 900 ha. The operations will again be taken up in the new year, as soon as sufficient natives are available, in order first to examine the remaining area of the 900 ha., and thereafter the adjoining area. The area in the Dunes has not yet been opened up. Operations were begun in the first half of this year in the drift sand field in front of the Dune field proper, and about 30 ha. were tested with a sand drill. In the course thereof a fairly considerable flow of brak water was found which seemed favourable for the sinking of a well. The well justified the expectations, and now gives almost sufficient water for the running of machines 1 and 3. The prospecting party which should have examined the gravel layer leading to the Dunes in the neighbourhood of the well was utilised to open up the well, and the prospecting work proper for the Dune area could not after this be taken up again owing to shortage of labour. It was found that drilling experiments with the sand drill did not give reliable results, therefore this year as soon as the work in the Dunes has been taken up again a commencement will be made with an iron-lined shaft, which it is expected will prove more effective. The prospecting trenches in the "Annental" were, so far as the sand deposit did not exceed 50 cm., continued to the hard rock bottom to a width of 2 m. and in lengths of from 1 km. to 2 km., according to the width of the valley and the occurrence of gravel deposits. A distance of 250 m. was left between every trench. The total length of the "Annental" until it merges into the Dunes is approximately 4 km., 2½ km. of these have been prospected in the manner before set out, while in the Northern part the prospecting operations were completed at the end of 1910 and beginning of 1911 by working with hand machines. The result, as stated previously, gives a general perspective which amounts to this, that the side situated towards the "Charlottental" carries throughout a payable diamondiferous deposit of an average of ¾ carats to the cbm. Beyond the centre of the valley, towards the side lying opposite, the diamondiferous deposits decrease. Apart from this, however, depressions in the ground filled with sand, carry diamonds. The prospecting trenches, as they are carried out, are shown by the Surveyor on the maps. It should be mentioned that the prospecting operations hardly permit of an exact calculation. The real object of this work is to ascertain the fact that the areas prospected can be profitably worked. The topographical map of the Company's area, made at the beginning of this year, and which has been brought up-to-date gives a general view of the area worked. The quality of the stones has somewhat decreased in size but not in regard to form or colour. The size has altered from an average of seven stones per carat in the preceding year to eight stones per carat this year. The smaller size of the stones was caused by the more thorough working of the Schiechel machines, with which in this year more than half of the production was achieved, the remainder of the output being produced by the hand washing machines of the old system. In addition to this, No. 1 machine has been working since the middle of December, 1910, on an area in which the size is somewhat under the average recovered on other parts of the property. The proportion in size per 1,000 carats during the last year was as follows :—About 2½ carat of ½ carat and upwards; about 250 carats of ¼ carat to ½ carat; about 115 carats of ⅙ carat to ¼ carat; about 217½ carats of 1·10 carat to ⅙ carat; about 84 carats of 1·10 carat. The average price obtained by the Regie per carat amounted to approximately M21.45, against M23.64 in the preceding year. The price this year has again been unsatisfactory in my opinion, as it was last year. The nett proceeds, without working expenses, amounted to M11.55. The working costs in this year were as follows :—Cost per load mined, M1.64; cost per load washed, M4.92; cost per carat, M4.95. (In these costs no administrative charges nor allowance for depreciation, etc., are included.) These increased costs as against the previous year are made up as follows :—1. The daily wage for the Ovambo labourer has increased from M2.40 to M3 per head, owing to the higher transport and recruiting fees while the efficiency of the labourers has gone down, which chiefly showed itself in the reduced result of their work. 2. The ground having to be mined from greater depths and transported from greater distances required more labour, while at the same time the diamondiferous contents were somewhat less. Up to now the richer places have always been at the surface. From about 20 cm. depth the value per load almost throughout is reduced by 30 to 40 per cent., but then remains constant until bed rock is reached. In sifting the gravel from the raw material, above referred to, in the most economical way lies for the future the main problem in regard to the question of more payable working. The question of the winning of the diamonds out of the gravel which has been prepared by the removal of the sand can be considered as good as solved by the Schiechel machine, even if these machines still require material improvements in order to reduce the working expenses. In itself the Schiechel system has fulfilled expectations. By repeated control washings with the improved Schiechel sieve it has been found, that even with this machine, losses of about 5 to 8 per cent. occur. Whether these losses can be entirely avoided will be ascertained by experiments with a double-banked machine, with which also at the same time the production can be doubled by the use of new sieves. Under any circumstances the actual process of concentration and gravitation should present no difficulties, as these can easily be remedied by alterations and improvements. The greatest difficulty for solution is the matter of the moving of the large bodies of sand out of the deep deposits, the sifting of this, and the transport to the Schiechel machines. Unfortunately none of the experiments hitherto undertaken have up to now produced a satisfactory solution, and this question is all the more difficult as the surface conditions are different with almost every company in the district, but by continued practical experiments a useful installation of machinery will, no doubt, be found for this purpose also. The requirements as to water for the installations and hand machines are met as to one half out of our own well, while the remainder is taken out of the water tank installed on our ground in the second half of this year by the Kolonial Bergbau Gesellschaft for the price agreed upon. The so-called drinking water well has decreased somewhat in productiveness, and is no longer used for washing purposes, but is now only used for drinking water. All three of the installations are connected among themselves by a 60 centimetre gauge light tramway, each installation has also about 3 km. track for sand transport. In the last month the building of a connecting line of rail with Kolmans Kuppe Station has been started, and this will be completed by March. The health conditions among the natives were generally satisfactory during this year. During the year a kind of typhoidal sickness appeared, beginning at the end of October, which, however, claimed far fewer victims than in the preceding year. To all appearances this epidemic is now (in January) dying away so that no further consequences affecting the work will result therefrom. The enlargement and removal of the Lazaretto for natives was undertaken in September and October of this year by which measure cases of sickness were prevented. The former large main location for natives was broken up in the first half of this year and smaller sized locations were erected near the machines 1 and 3 respectively, while the main location remained in the neighbourhood of machine 2. The future payability of the undertaking depends chiefly upon the introduction of taxation on nett profits instead of as hitherto on gross receipts. It is not to be denied that with the beginning of production from greater depths the costs will be increased, even with the installation of improved machinery. Work done hitherto has confirmed this supposition beyond doubt. A rational system of working further demands that the ground be systematically mined, and that one is not compelled, as must unfortunately frequently occur under the present system of taxation, to temporarily leave alone poorer deposit. From careful estimates based on experience from the mining results hitherto, the number of carats stated in the annual report for 1909 can even be exceeded, providing the question of dealing with the sand-drifting is satisfactorily solved, and that the Government tax is altered so as to enable the working of the poorer ground to be gone on with.

SOUTH AFRICA'S MINERAL OUTPUT FOR MARCH.

Details of the Gold, Silver, Coal, and other Mineral Returns for the Union.

According to the returns issued by the Mines Department this week, the mineral output of the Union in March was of the value of £3,452,617, as against £3.577,809 in February, a decrease of £125,192. Appended are the details :—

	March.	February.	Increase.	Decrease.
Gold	£3,233,485	£3,258,412	—	£14,927
Silver	9.291	8,321	970	—
Coal	167,798	153,855	13,903	—
Other minerals	42,043	157.181	—	115,138

The output of diamonds is published half-yearly.

GOLD OUTPUT.

The following table shows the number of mines working in the various districts declaring gold and the district outputs in March :—

District.	No. of Mines.	Stamps at work.	Tube mills at work.	Output, Fine Gold. Ozs.
Witwatersrand	62	9,566	256	729,492
Heidelberg	3	125	2	7,175
Klerksdorp District	4	70	2	2,788
Ottoshoop	1	10	0	112
Barberton District	12	250	1	7.345
Pietersburg	3	25	0	291
Pilgrim's Rest	18	190	5	13,974
Totals for Transvaal ...	103	10,236	266	761,974
Cape	—	—	—	1
Natal	—	—	—	13
Total for the Union ...	103	10,236	266	761,226

COAL OUTPUT.

The following is a summary of the operations of the coal mines during the month :—

District.	No. of Collieries producing.	Tons mined.	Tons Coal sold.	Value per Ton. Pit's mouth. s.	d.
Springs-Brakpan area ...	5	77,564	56,252	5	6
Middleburg	15	355,539	306,166	4	3
Other Districts	9	39,033	38,027	3	9
Transvaal totals ...	29	472,136	400.445	4	4
Cape	8	10,973	6.387	10	6
Orange Free State	5	52,612	41,696	5	4
Natal	20	323,422	232,460	5	7
Totals for the Union	62	859,143	680,988	——	

COPPER AND TIN.

The following is a statement showing the output of tin and copper for March :—

Copper.

	Output. Tons.	Shipments. £
Transvaal	78	—
Cape	1,361	—
Totals for the Union	1,439	—

Tin.

	Output. Tons.	Shipments. £
Transvaal	249	26,586
Cape	—	—
Totals for the Union	219	26,586

OTHER MINERALS.

Sales and shipments of minerals (other than gold, coal, copper, and tin) :—

	Tons.	Values.
Asbestos	104	£1,645
Graphite	3	88
Magnesite	33	75
Manganese	—	—
Lead	85	541
Zinc	—	—
Lime	7,085	12,387
Flint	80	571
Miscellaneous	22	150
	Ozs.	
Silver in gold bullion	81,635	9,261
Silver in other minerals	289	30

LABOUR RETURNS.

Progressive Totals.

1911.	White.	Coloured.
July	32,502	274,408
August	32,409	270,963
September	32,223	269,500
October	32,079	267,703
November	31,820	263,884
December	31,701	259,641
1912.		
January	31,812	265,100
February	31,845	274,140
March	31,867	283,765

ACCIDENTS.

During the month 267 accidents occurred in the mines throughout the Union as the result of which 5 white and 85 coloured workers were killed, and 27 white and 193 coloured workers injured.

Progressive Totals.

	No. of Accidents.	Killed. Whites.	Killed. Col.	Injured. Whites.	Injured. Col.
January	232	5	62	35	169
February	258	8	75	29	193
March	267	5	85	37	193

Benoni Consolidated.

The results of the operations at the Benoni Consolidated Mine for the month of March were as follows: Fifty-five stamps ran 26.493 days; tons milled, 19.777; gold recovered: mill 3,694.814 ozs., cyanide 656.999 ozs., total 4,351.813 ozs.; recovery per ton milled, 4.401 dwts.; total working cost, £18,478 13s. 7d.; revenue, £18,234 8s. 8d.; loss for the month, £244 4s. 11d. No allowance has been made for development other than actual cost of work done. The Board of Directors regret that, owing to the failure of the cyanide plant to treat successfully the sand portion of the pulp from mill, the operations for the month of March have again resulted in no profit being made. The screen value of the ore crushed for the month was 6.7 dwts., or 28s. 2d. per ton, equal to a yield, with, say, a 93 per cent. extraction, of 6.231 dwts., or 26s. 5½d. per ton. This value is verified by the recovery from the mill of 3,695 ounces, equivalent to 55 per cent. of the screen value. The clean-up of the cyanide plant, however, which has been operating only on the sands (the slimes being run to dam) was extremely disappointing, the total recovery amounting to only 656 ounces, the pulp from the mill assaying 2.64 dwts. Since crushing operations started in November last, 76,569 tons of sorted ore have been milled, the screen value of same averaging 6.37 dwts., or 26s. 9d. per ton, making a total gold contents of £103,590, equal to a recovery, with, say, a 93 per cent. extraction, of £96,338. Stoping operations have, therefore, closely borne out the estimated value placed on the payable reserves, which at the end of 1911 amounted to 606,839 tons, having a milling value of 6.56 dwts.; and as far as the mining operations are concerned the results up to date must be regarded as entirely satisfactory. The mill recovered 12,579 ounces, worth £54.197, or 52 per cent. of the total gold contents, to which must be added the gold absorbed by the plates. The total pulp leaving the battery, amounting to 76,000 tons, averaged 2.3 dwts. per ton, the gold contents of same being therefore 8,740 ounces. Of this amount only 2,187 ounces have been recovered from the cyanide works, equivalent to £10,564, or approximately 10 per cent. of the screen value of the ore. This result scarcely covers the cost of treatment. Under ordinary conditions, allowing for an extraction of 93 per cent. and a total absorption of gold in mill and cyanide works of, say, 2,500 ozs., or, say, £10,000, the total gold recovered would have been worth £86,338, as against £64,761 actually won, thereby showing a deficit over the period of operations of £21,577. It must, however, be borne in mind that about 38,000 tons of slimes remain untreated and have a value of 1.1 dwts. The greater proportion of this will eventually be treated. Owing to the unsatisfactory results, the Board considered it necessary to obtain independent advice. Mr. F. L. Bosqui, Consulting Metallurgist of the Rand Mines, Ltd., was consulted, and it is anticipated that his report and recommendations will be completed within a week's time. Under the circumstances, the Board, in view of the inability of the cyanide plant to treat the pulp from a monthly crushing of 20,000 tons, and the consequent loss of gold, have for the present adopted the policy of limiting the crushing capacity to about 12,000 tons per month. The manager is of the opinion that this is the maximum safe capacity of the cyanide plant for treatment of both sands and slimes, and it is hoped thereby to pay current expenses, including replacement of ore stoped, and avoid dislocating the labour force until arrangements are made to raise the necessary funds to make the required alterations and additions to the cyanide plant.

THE ELECTRICAL ENGINEER IN SOUTH AFRICA.

Why Colonial References Are Not Valued in Europe—A Bitter Attack on the Profession—Allegations with a Possible Substratum of Truth.

[By Colonial.][*]

Many engineers who have been in the Colonies have found, no doubt, on their return to England that the experience they have obtained abroad has not much weight at Home, and also that engineers trained in the Colonies are not considered as good as men trained in the Old Country or on the Continent. This is rather an interesting point, and there is much to be said on both sides; at the same time, it is an important question now that so many of our Colonies are going ahead in engineering matters, in some cases manufacturing their own goods. Many an engineer goes abroad for a few years, with the intention of ultimately returning to England, so that this matter is one which he must consider, in order that he may understand what his standing will be when he returns Home. One of our Colonies which is advancing apace in matters electrical, and opens tremendous possibilities for the electrical engineer, is United South Africa; a short description of the conditions and status of the engineer there may not be out of place, and will serve to show why Colonial experience does not count for much. The root of the matter is that many Colonial engineers do not know their work, and are, in fact, only half-trained men, in some cases being absolutely untrained, merely self-taught, and not entitled to be called professional men at all; some such men are chief engineers and managers of engineering works, and as they control the work of those under them, it follows that the latter do not see things done in the manner in which they should be done, and consequently get into slack ways themselves, and get no up-to-date experience. Many of these managers, borough electrical engineers, etc., are men who came to the Colony many years ago, and having absolutely no idea of modern methods, they run their works in the style that they were run in England, 10 or 15 years ago; this especially applies to central stations, some of which are an absolute disgrace to those in charge of them. What chance, then, does a central-station engineer in South Africa have of obtaining experience which will be useful to him on his return to England? Can it be wondered that his Colonial experience is belittled? It can safely be said that one of these engineers, having been, say, five or seven years in the Colony, would be rather "at sea" in a modern central station, run on up-to-date lines. It is not intended to imply that *all* the central stations in South Africa are obsolete, in fact many of them are quite modern; for instance, many of the new stations in the Transvaal have the very latest machinery, but it cannot be denied that things are often run in a very slip-shod manner, with an entire absence of discipline, and many of the engineers in charge of the plant do not understand or appreciate it.

Another reason for the non-recognition of Colonial experience is the fact that the Colonial engineers do not in any way endeavour to maintain their status; they will be shift engineers to-day, and switchmen or glorified wiremen to-morrow, if they can get better salaries as the latter; it naturally results that the wireman class are shift engineers, etc., in time. How, then, can it be expected that the home engineers will attach importance to an engineer's Colonial references? He may be one of the glorified wireman type, in spite of his good references as an engineer. It is no idle talk to say that there are many men in South Africa glorying in the title of "Electrical Engineer," boasting of their A.M.I.E.E. (how they ever get it, Heaven knows), who, if the truth were known, are only wiremen or drivers, and have received no training whatsoever; in spite of this, they are, to all intents and purposes, electrical engineers, and are classed as such, even in some cases by the Government. These men, then, come home with their papers, the same as *bona fide* men; can it be wondered at that they are looked at askance? The genuine must suffer with the rest, since no weight can be placed on their papers, and there is no doubt that "paper experience" counts nowadays. It must be admitted that many men who, on account of their poor qualifications, could never get a good position in England go abroad and manage to get what they cannot get at home. This must prove that the quality of the engineer in the Colonies is not up to the standard of the man at home. These few points will serve to show why Colonial references do not avail much in England; what, then, is the remedy? This question can be answered in a few words: "Raise the tone and status of the electrical profession in the Colonies." How can this be done? In many ways; a few may be mentioned. First, the help of the Government must be obtained; they must define the term "electrical engineer," and institute a State Board examination, which will take the form of an ordinary examination in electrical and mechanical engineering—the mechanical section alone would weed out scores; they must also make genuine enquiries as to the candidate's training and experience, and pass an Act forbidding anyone to be employed in a position of responsibility who has not successfully passed the State Board; in fact, they must follow the example of the mining electrical engineers in the Transvaal. Under these conditions, Colonial references, backed up by the State certificate, would be of value in England, and gradually the stigma attaching to them would disappear. This would stop engineers from lowering their status by going as switchmen, wiremen, etc., for, naturally, an employer would look askance at an electrical engineer in possession of his certificate who had lowered himself and his profession in this way; whereas, at present, nothing is thought of it, as many of the so-called engineers are in reality wiremen and electricians, and consequently dropping back to their real trade is lightly regarded. Cases are come across where men are employed as shift engineers who never before saw a boiler in their lives; is this right, when so much damage and loss of life may be occasioned by their ignorance? The crux of the whole matter is that those who are in charge, and who employ these men as shift engineers, are not themselves capable; in fact, many of them would not be competent to take the post they are offering to others. Municipalities are the worst in this respect; the councillors do not, of course, know anything about engineering, and get hold of men as their borough electrical engineers who are quite incapable of managing the department efficiently. It stands to reason that if good men are to get recognition, their chief must himself be a good engineer, so that he can appreciate their value and differentiate between them and the half-trained men. The only way to impress upon municipalities the importance of choosing well-trained men to manage their electric supply departments is through the medium of the Press—in fact, a regular campaign is needed in all the leading newspapers, pointing out the advantages to themselves and the towns and cities generally. There are many central stations which, run on up-to-date methods, could be made to pay, and pay well, instead of being a burden on the ratepayers. With prices ranging from about 6d. to 1s. per KW.-hour for lighting, 2d. to 3d. for power, and 1d. to 1½d. for traction, many works could be turned into veritable gold mines; whereas some of them make only small profits, or next to none, and in some cases they are run at a loss, simply because the chief knows nothing, either from an engineering or a business point of view. Some municipal supplies do *nothing* in the way of publicity, and many people in the towns hardly know that a power station is in existence. It may appear that all this is away from the point, but these facts are mentioned to show that the central-station industry is rotten to the core, especially those owned by the municipalities, and consequently the profession must suffer. If the concerns are not financial successes, then they cannot afford to pay good men; consequently the half-trained men are taken on and considered cheap! Then the confusing of the engineer with the "amateur" begins. All this can be traced to the incompetency of the chief. If a few statistics of some of these stations were looked at, the figures would be appalling to the home engineer—12 to 14 lb. coal per KW.-hour, etc.; the chiefs take no steps to alter it, and the Councils do not know any better. It may be asked why the engineers concerned do not remedy matters: the answer is easy: they cannot. They say their plant is out of date; in many instances it is, but it could easily be improved upon and "modernised," or, better still, replaced by up-to-date machinery. They will say that their committees will not sanction the expenditure—why? because the engineer is unable to prove to them the advantages, and consequent saving; it is beyond him. And so things go on in the same old way, and the chief bluffs the Council and keeps his post!

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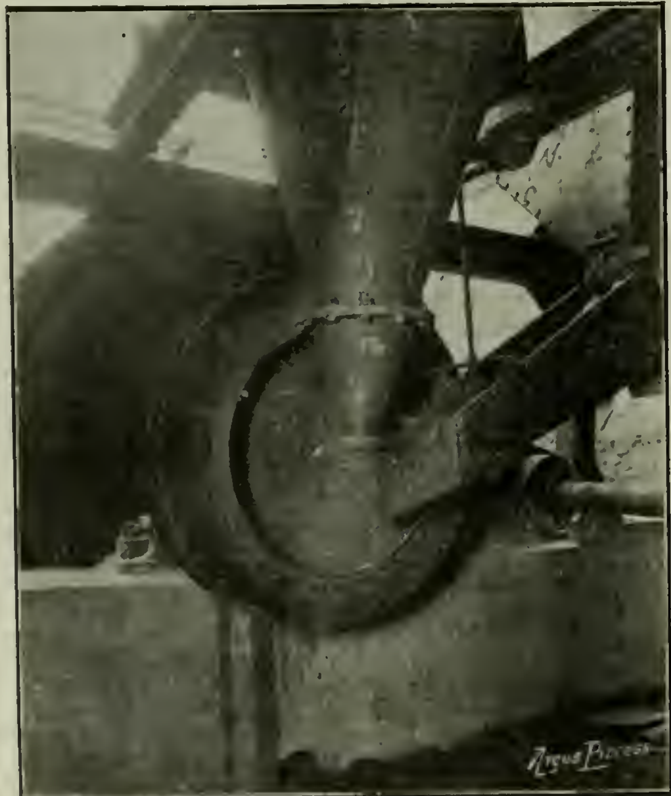
[*] This article has been contributed to the "Electrical Review" by a young engineer who has acquired experience in central stations, both in South Africa and at home. We, of course, disclaim responsibility for the views expressed, but believe they may be of interest to our readers. There is another side to the question, and we shall be glad to receive communications from those acquainted with it.—*Ed. S.A.M.J.*

In some parts they are waking up somewhat, and importing men from home, in some cases with success, but very often the wrong men are brought out, simply because the chief does not know a good man. The log books of some stations would form an excellent "funny book" for home engineers; thousands of figures may be seen, but what they are there for, no one knows; if they were asked how many lbs. of water they consumed per KW.-hour, or boiler hour, or their KW.-hours per boiler-hour, etc., they would look puzzled, and shrug their shoulders. Ask them to show cards from their engines, the results of boiler and engine tests, their coal analyses—few could do so; their coal is cheap (?), that is about all they know. Maybe some engineer, a little more enlightened than his brothers, reads that turbines are more economical than his ancient reciprocating sets, or he thinks they would be; he decides to recommend his Council to sanction the necessary expenditure; he knows nothing about them, probably has had nothing to do with them, but still decides to instal them without taking the trouble of going into the matter and estimating the saving, taking capital charges, sale of old plant, installing of superheaters, extra vacuum required, etc., into account, and probably ends up by being in a worse state than before. Before installing them, his experience consists of taking an assistant with him and *seeing* someone else's plant running. This will show what stamp of men some of the chiefs are in South Africa, and the consequent class of men under them. Can it, then, be wondered at that Colonial engineers' papers are of little avail in England when the profession is in this state? There are many good engineers in South Africa, but what can they do under chiefs of the stamp outlined? They must keep quiet and say nothing, whereas, were their advice taken, great improvement would result. Engineering is a great and important profession, and the electrical section will be of the utmost importance to South Africa, and in the development of the country; so let each member of it do what he can to raise the status of all connected with it. The South African Institute of Electrical Engineers has done yeoman service for the mining section, and obtained at least some recognition for the electrical engineer at the mines; but there is yet a far wider field open for it in the raising of the standing of the electrical engineer all over South Africa, and getting him to realise his own responsibility in the matter—not to allow himself to be classed among the wireman-engineer type, and to refuse to accept a position beneath his status because it happens to be more lucrative. The engineers must stand together to retrieve their position before it is too late, and then, and only then, will their Colonial references carry any weight at home.

Schmitt's Tube-Mill Feeder.

The accompanying illustration shows the tube-mill pebble and pulp feeder, devised by Mr. C. O. Schmitt. It consists of a shallow cylindrical trough or channel, which is separated by a dividing plate from an inner spiral chamber attached to the feed trunnion of the tube-mill. At the periphery of the dividing plate, and hidden by the outer rim of the trough, is an opening into the feed end of the spiral chamber behind. The pulp and pebbles are delivered from the dewatering cone and pebble shoot respectively into the trough, and at each revolution the quantity thus collected is directed by means of a baffle through the opening aforesaid into the spiral chamber, and thus to the interior of the tube-mill. The device is of advantage where fall is limited, since the apex of the dewaterer may be lower than the axis of the mill. Other pulp feeders require the apex of the dewaterer to be at least twelve, and preferably eighteen, inches higher than the axis. The photograph was taken at the Robinson Deep.



SCHMITT'S TUBE MILL FEEDER.

Mr. Penlerick Fined.

The case of Mr. Sidney Penlerick, late general manager of the East Rand Proprietary Mines, came on before the Magistrate of Boksburg again last week. The case had been remitted for the second time, the Magistrate being empowered with extended jurisdiction. The charge was to the effect that the accused had contravened the Mining Regulations by sending in false returns of gold recovered for a number of months between April, 1909, and August, 1911; also that certain gold in March, 1911, had been shown as derived from milling, whereas its source was cyaniding. The accused pleaded not guilty, and the evidence for the prosecution, as taken at the preparatory examination, was read. The defence called no witnesses, but made several exceptions to the charge on the grounds that the section disclosed no offence. The Magistrate over-ruled the exceptions, and sentenced the accused to pay £100, or to go to prison for two months. An appeal was noted, and the fine was lodged in court.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Promotion on the Mines.

A SPIRITED REPLY TO SOME RECENT CRITICISM.

To the Editor, *South African Mining Journal.*

Dear Sir,—It seems unfortunate that "Airblast," after giving expression to such profound truths as are contained in the early part of his letter, should have spoiled his case and neutralised any good effect which his efforts might have achieved by indulging in a wholly uncalled for and, as I shall show, utterly unjustified attack on the mines' secretarial staffs. "Airblast" would have been well advised had he written you two letters—one while smarting under some indignity, real or imaginary, placed on him by a "hyphenated" business manager, and the other giving effect to his very sensible views with regard to the preference shown to School of Mines men, to the exclusion and detriment of equally capable men who have received their training locally. Surely the two matters are quite foreign to one another! How can the reduction of the secretary's salary help "Airblast" and those who feel with him? Has "Airblast" ever heard of the economic law which lays down that the wages paid for any particular class of work are in a large measure regulated by the supply of men capable of performing such work? I venture to say—and, unlike "Airblast," I speak with some knowledge of secretarial appointments—that the most difficult official to find to-day is a capable mine secretary. Managers, mine captains, and shift bosses change, and there is neither delay nor difficulty about their successors. On most mines there is a plethora of certificated officials—managers, mine overseers, and engineers. With mine secretaries, however, the position is different. There are not enough capable men to go round; and, as is only to be expected, there is competition amongst the various groups to secure the services of the limited number available. This, perhaps, accounts in some measure for what "Airblast" considers the excessive salaries paid; though, as I shall endeavour to show, when the qualities which the position calls for and its responsibilities are taken into account, it will be found that the remuneration is surprisingly small. When your correspondent talks about one week's work per month, he makes one wonder whether his effusion is worth taking seriously; and the only reason why I have taken the trouble to reply is that it contains one or two lucid passages. If "Airblast" would only get rid of his prejudices he could make an interesting contribution to a matter of which he seems to have some knowledge, the question of promotion in the technical departments. But when he gives expression to his distorted views on mine office matters he reveals a lamentable ignorance of his subject.

I will now give a few reasons for what passes "Airblast's" understanding, viz., why it is that a secretary should be paid more than a shift boss. In the first place, what is the qualifying period of experience for a shift boss? The School of Mines man—your correspondent's *bete noir*—comes out fresh from the college, and is frequently appointed to the post straight away. Whoever heard of a man fresh from a commercial academy being appointed mine secretary? The thing is inconceivable. Leaving the question of School of Mines men out of the question, is it not the case that a man of intelligence can, and frequently does, qualify for the position of shift-boss in six months? I can assure "Airblast," and others who entertain the same views, that the qualifying time for even such subordinate positions as assistant secretary and storekeeper is as many years—and that after probably five or six years' varied commercial experience in other offices. I will, however, confine my remarks to the secretary, who, next to the School of Mines man, seems to be "Airblast's" greatest aversion. With few exceptions, the man appointed is at least thirty years of age, and has had to undergo an apprenticeship of from ten to fifteen years. Contrast that with the shift-boss of twenty or twenty-one, who twelve months prior to his appointment, may never have seen the inside of a mine. If "Airblast" ever becomes a general manager, his first action will doubtless be to reduce the secretary' salary to half the present figure. Subordinate officials will, logically, have their salaries reduced proportionately. He will then be in the happy position of having a storekeeper responsible to the secretary for anything from ten to seventy thousand pounds worth of stores in receipt of the munificent salary of twenty pounds a month. "Airblast" gives a doleful description of the lot of the underground man. Nobody ever thought it was a bed of roses; but surely the mine secretary does not live a life of everlasting joy and felicity! He is appointed—and rightly so—by the head office, and this fact is rarely forgiven him. He has to please the manager on the one hand, and the head office officials—directors, secretary, mine auditor, and financial manager—on the other, and, as is only to be expected, he is frequently between the devil and the deep sea. As to a mine secretary's qualifications, "Airblast's" talk about the work not being above the standard of "a board school youth grounded in simple arithmetic" is nothing but senseless twaddle. Firstly, the mine secretary has to be an accountant. This qualification alone takes years to acquire. Further, he has to be acquainted with all the laws relating to mining, *e.g.*, Mines and Works Act and Regulations, native labour, gold law, phthisis, mining taxation, explosives, stamp duties, contracts, and bills of exchange, to mention a few that occur to me as I write. Take one subject alone, viz., mining taxation; it probably takes as long to acquire a specialised knowledge of this subject as it does to qualify as a shift-boss. The mine secretary has also to supervise the storekeeping and timekeeping (native and European), and, in some instances, the compound work. If "Airblast" thinks that the experience necessary efficiently to carry out such work can be obtained in a few months, or even a few years, he is greatly mistaken. I am quite prepared to admit—it would be absurd to deny it—that all mine secretaries do not possess the qualifications which I have set out. Some secretaries, like some shift-bosses, have been appointed for reasons unconnected with their abilities. I will, however, venture the opinion that more nepotism can be traced in the underground department of any one of several mines than in all the mine offices on the reef.

A point which "Airblast" and others would do well to remember is that the office staff is limited by regulation and carefully scrutinised by head office, and that the clerks have to please not only the secretary but also the mine auditor. The result is that the secretary can't afford to carry deadheads. Contrast the position in this respect with the underground department. If the same system were applied there, I venture to think that many now in receipt of useful salaries would have to find employment elsewhere. Most managers will freely admit that the official who can help him most is a capable, sensible secretary. He can relieve him of the numerous harassing business details, and if he knows his work, he can be of the greatest possible assistance in checking extravagance (of shift-bosses and others) by so presenting the accounts and statistics that the manager can see at a glance how things are going in every department. In talking, as he does, about the relative responsibilities of mine captains and mine secretaries, "Airblast" plainly demonstrates his inability to form a sound judgment, and his utter ignorance of what takes place in a mine office. We secretaries frankly acknowledge the important part played by the mine captains; and they, in turn, will, I think, be the first to admit that the part played by a well-ordered mine office in the internal economy of a mine is just as important. Generally, as regards pay and leave privileges, both are on the same footing. In comparing the position of shift-boss with secretary, your correspondent will find few with even the most elementary knowledge of the conditions prevailing on mines to see his point. Shift-bosses are usually classified with assistant secretaries, timekeepers and storekeepers, and if there is any injustice it is against the clerical man, who, as a matter of fact, puts in as much overtime in the early part of any one month as a shift-boss does in a year, and whose duties are much more arduous and responsible. Generally speaking, there are three classes of shift-bosses on mines. First, the recent arrival from the School of Mines. It does not require much perspicacity to see that " Airblast " does not belong to this class. Secondly, there is the hard-working, sensible miner who has been underground from his youth, and who, by reason of his experience and knowledge, can command the respect of, and assist, the miners. These men are the back-bone of the industry. But from the tone of his letter, I find it impossible to place " Airblast " in this category. Lastly, there is the man who has been made shift-boss, Providence only knows why. He is a source of anxiety to the mine captain, and of embarrassment to the manager, who may not like to dispense with his services for fear of offending someone in authority. Such a man finds no counterpart in the modern mine office. The last point which your correspondent tries to make in the course of his ill-tempered and stupid flounder, anent the " business manager with a hyphenated patronymic," reveals the *raison d'etre* of the whole letter. Some gentleman possessing this attribute has evidently had the bad taste to cross him. If I am right in my surmise, surely it would be better form if " Airblast " were to go to the delinquent and tell him his mind, rather than write an ill-mannered scrawl inveighing against a body of men of whom and of whose functions he does not possess the most rudimentary notion. The only place where a misfit can thrive without being found out is underground.—I am, etc.,

MINE SECRETARY.

Tin in the Transvaal.

To the Editor, *South African Mining Journal.*

Sir,—In your last issue you gave particulars of some new tin flotations in London, from which it is evident that some of our London representatives and investors are more alert than our Johannesburg friends in realising the future possibilities of the large tin area that exists in the Waterberg district, north-east of Zaaiplaats, especially on the farms Appingendam, Bellevue and Delagoa. That the true tin lodes of this district have been located and exposed, particularly on the farm Bellevue, there is, in my mind, not the slightest doubt about it. It seems a great pity that so little capital is obtainable in this country to properly open up our tin fields, which in future are bound to become a big asset. The Bellevue Tin Syndicate has, to my own knowledge, opened up a lode 5½ feet in width assaying 3 per cent. at a depth of 30 feet, the outcrop only showing traces. This same lode I have located at various places along the strike, and carrying tin in every case where exposed. No work worth speaking of has been done on the strike except by the syndicate. I have also discovered two more well-defined lodes on this particular farm, one of which I have traced and located for a distance of at least three to four hundred yards, varying in width from five to eight feet, and assaying on the outcrops from 0·25 to 0·45. The lode matter consists of altered granite, the pegmatite veins being in close proximity to the lode and carrying tin. I believe active operations are about to commence on two different blocks of claims on the above outcrops. The reason why not more work is being done on this farm is, as I have stated, the want of capital, and also on account of some of the prospectors looking for the same occurrences that exist on Zaaiplaats and taking no notice of the true lodes that traverse this property and which are outcropping very prominently in different places.—Yours, etc.,

W. COWAN.

Rand Geology.

To the Editor, *South African Mining Journal.*

Sir,—I am rather surprised at Mr. A. R. Sawyer making the confession before the Geological Society that he once reported for the Geldenhuis Estate on their property, and failed to observe—as has Dr. Mellor—that on the crest of the hill, north of Main Reef sereis, there lie Du Preez series, as well defined as at Du Preez itself. By such confession it is tantamount to saying that Du Preez has no exteusion westward, which is absolutely wrong, in the face of Nature's generous exposé of it at intervals for miles in that direction. Not, perhaps, in the horizons where well-known geologists and engineers have been looking for it, but they must look again elsewhere, and try and make quite certain this time, as even laymen are beginning to discuss the matter from a commonsense point of view. They say that they cannot imagine how it is possible that the contractors who laid down this banket age of ours should have extended all other series, east and west, north and south, as the case may be, and only left a sample bit of Du Preez for the benefit of one mining group. As a matter of fact, before the war, I pointed out Du Preez' western extension—for consideration to come—to the directors of the Geldenhuis Estate, and their manager sank a few feet in the shales, next the North Reef, which never carries any values to speak of, and that was the last I heard of it! The shaft, with its dump, is there to-day as evidence of the great interest the then directors took in the opening up of this most-sought-after series, whilst a few days back I read that the directors of Rietfontein, adjoining, think so highly of it that they have just completed another borehole, of considerably over 3,000 feet, merely to try and locate it under diabase flows and what not. In about 1893 I located Du Preez in the southern portion of " Barretts Rietfontein " for the syndicate, but because it was too far south from the Rietfontein workings to please these gentlemen, or their geological advisers, nothing came of it, and the outcrops are still there untouched as a monument to them, or myself, in whichever light it is looked upon. The members of the Geological Society are very fond of discussing faults, but it is a great pity for the Rand's sake that they cannot see that one, as it would be worth discussing.—I am, etc.,

SCOTT ALEXANDER,
" Rand Stratigraphist."

Johannesburg, April 21, 1912.

The Butters Filter Case.

To the Editor, *South African Mining Journal.*

Sir,—In the action for alleged infringement of patents brought by the Moore Filter Company against the Tonopah Belmont Development Company for using a Butters Filter, the United States Circuit Court has decided that the Butters Filter apparatus and process are distinct from and independent of the Moore Patents, and are, therefore, no infringement thereof. The Court gave five separate reasons for arriving at this decision, any one of which alone is sufficient evidence of non-infringement. It is generally recognised that the Butters Filter Patents cover the most successful principle of slime filtration on the market.—Yours faithfully,

Charles Butters and Co., Limited,
J. C. HUMPHREYS,
Secretary.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings, Box 2061, Johannesburg.

Rhodesian Section.

LATEST MINING NEWS.

A Mines Office for Gatooma—The Pomposa Claims—Orcus Developments—Mr. Bayliss Leaves for the Congo—The March Output—Latest at the Falcon—Globe and Phœnix Reserves—The Shamva's Tonnage—Lonely Reef Developments—The Enterprise District.

The Mines Department has seen its way to meet the demand from the Gatooma area for the opening of a mines office in the central township. Prospecting licences will henceforth be issued at the office of the Assistant Magistrate, Gatooma, and an official of the Mines Department will attend every Friday at the same office during business hours for the purpose of receiving registration papers, declarations of work, and other mining returns. Hitherto, members of the mining community have been under the necessity of journeying to Hartley for the transaction of their business, involving, of course, expense and loss of time, in fact, general inconvenience. This bother is now obviated by the establishment of facilities on the spot, which is a consideration which will be vastly appreciated throughout the whole mining area. The change is not without its interest to outsiders, since it indicates an official acknowledgment of the importance and influence of this growing and enterprising community.

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Mr. P. S. Triggs will immediately erect a seven-stamp 1,250lb. gravity mill on the Pomposa property, Gatooma district. It is stated that this venture has never looked so well as at the moment, the reef has been proved for a great length along the strike, whilst several parallel veins have been prospected with satisfactory results. There are very few privately-owned properties in the district that have been so thoroughly opened up as the Pomposa, about a dozen shafts have been sunk, most of them to water level, which is about 116 feet. Some hundreds of feet of driving at depth has been done. The values for the whole length of the strike are given as averaging up to a good profitable value.

* * * *

Mr. P. L. Playfair, recently mine captain of the Simmer and Jack Proprietary Mines, Ltd., Johannesburg, has been appointed manager of the Orcus claims, and has taken up his residence on the property. The Exploring Land and Minerals, who hold the option over the property from Mr. Luxat, are pursuing an energetic prospecting policy, and having proved a line of reef along a considerable strike, have pegged a number of blocks as extensions. A headgear is being erected and a pumping plant has been installed during the week, to which is to be added immediately a hoisting plant, to enable work to be done below water level; the present intention is to sink to a hundred feet and then to drive along the body.

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Mr. R. T. Bayliss, managing director of the B.S.A. Company's Mines Development Company, Mr. J. C. Pickering, the manager in Rhodesia, and Mr. Heathcote, the London secretary, together with Mr. A. H. Ackermann, resident engineer of the B.S.A. Company, have left for the Congo. On their return they will make short halts at Bwana M'Kubwa, Broken Hill and Wankie.

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The Southern Rhodesia gold output for March has been declared at 51,072 ozs., value £215,102, an increase of 1,208 ozs., value £5,358, compared with February. Of the total, Matabeleland contributed 28,023 ozs., value £117,787, and Mashonaland 23,049 ozs., value £97,315. Other minerals produced were: Coal, 15,255 tons; lead, 50 tons; silver, 14,423 ozs.; chrome ore, 2,699 tons. These compare with 17,530 tons of coal, 13,404 ozs. of silver, 46 tons of lead, 3,136 tons of chrome iron ore, and 1·35 tons of wolframite, in February.

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According to Umvuma advices, that great gold-bearing kopje of ore known as the Falcon is about to be equipped with reduction and treatment plant. The Falcon ore body, in addition to carrying about 6 dwts. gold per ton, contains a small percentage of copper. It is said that the erection of plant will be completed by the end of October next. The management will have to expedite matters greatly if this anticipation is to be fulfilled.

* * * *

That the excellent state of affairs at the Shamva Mine—constantly increasing ore reserves of a steadily improving value—continues to be maintained is shown by the following cable, despatched by the local to the London office of the Shamva Mines, Ltd., on the 12th inst.:—Ore developed during the quarter ended 31st March, 1912, 283,740 tons, of an average assay value, unreduced, of 13·48 dwts.; reduced, 7·28 dwts. Tonnage at date—2,091,859 tons, of an average unreduced assay value of 8·08 dwts., reduced 4·97 dwts.

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A cable was recently despatched from the Bulawayo office to the head office in London of the Lonely Reef Gold Mining Co., Ltd., advising that the reef had been cut at the 8th level of the mine. At the centre of the cross-cut the reef is 48 inches wide, assaying 1 oz.; at 5 ft. north 58 inches wide, assaying 30 dwts.; at 5 ft. south, 48 inches wide, assaying 29 dwts. The point at which the reef was cut is in a lower grade section corresponding with No. 7 level. Expect values to improve on drives being extended.

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It is officially announced that the ore reserves at the Globe and Phœnix mine at the 31st March last totalled 178,582 tons, of the average value of 1 oz. 16·6 dwts., thus giving 326,805 ozs., value £1,372,581. At the end of December last the reserves totalled 173,613 tons, of the average value of 37 dwts. per ton, which gave 321,184 ozs., value £1,348,973. A year ago the tonnage was 181,137, and the average value 35·2 dwts. per ton, the total contents being 318,801 ozs., value £1,338,964.

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In the Enterprise district Mr. Byerley has been making considerable progress on the Perseverance mine, and will shortly commence crushing 1 oz. rock with a Tremain mill. Mr. Byerley has great confidence in the property, and it would not be surprising if the mine ultimately proved to be a very valuable proposition. He is also busy with development work on the Micky mine, in the Darwin district. A good deal of development work has been done, and the prospects opened up on the reef are now said to be more than favourable. Crushing here, too, may shortly be looked for. Reverting back to the Enterprise district, it is interesting to note that the Gold Fields people have secured a short option over the Bank property, and, as they never seem to take up anything nowadays that is not next door to being an absolute certainty, Messrs. Phipps and Butcher are to be congratulated upon having succeeded in inducing this great house to exploit their property. The purchase price of the claims—some ten blocks—has been fixed at the sum of £20,000, half in cash and the balance in shares.

MINING MEN AND MATTERS.

Mr. Alfred Cohen, resident director of Pniel Diamond Mining Co., Ltd., has left for England.

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Messrs. H. J. King and E. Wolfes, of the firm of S. Neumann & Co., sailed from Capetown on Wednesday last for England.

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Mr. Herbert Moss, Chairman of the Anglo-German Tins, Ltd., is visiting the property in German South-West Africa as a preliminary to a visit to London.

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Messrs. Chaplin, Geldenhuys, Oliver, Creswell, Wilcocks, Runciman and the Minister of Mines are the members of the Select Committee on the Miners' Phthisis Bill.

* * * *

The members and friends of the Association of Certificated (S.A.) Mechanical Engineers are holding a smoking concert at the Langham Hotel (Luthje's) this evening, at 8 o'clock. The general meeting will be held at 7 o'clock. Tickets for the concert can be obtained from the Honorary Secretary, Box 4305. Mr. Alexander Wallace, of the Robinson Deep, will occupy the chair.

* * * *

It is announced that Sir Abe Bailey, K.C.M.G., has resigned his seat on the board of the Eldorado Banket, and Mr. R. G. Fricker, Major H. E. Sapte, and Admiral Sir Albert Hastings Markham, K.C.B., have, on the nomination of the Gold Fields Rhodesian Development Company, Limited, been appointed directors. This step appears to follow naturally from the transference of the Rhodesia Exploration holdings to Gold Fields control.

* * * *

The annual dinner of the South African Institute of Engineers was held in the Carlton Hoetl on the 13th inst. Mr. F. H. Davis, president, occupied the chair. Those who had been invited, and most of whom were present, included the following :—G. Ainsworth, Sir George Albu, G. S. Burt Andrews, J. Arthur, K. Austin, J. Ballantyne, R. Barrow, R. A. Barry, Bartholomew, E. L. Bateman, J. W. Beatty, G. Bendien, R. G. Bevington, T. Black, A. E. Blevins, A. Bonus, F. L. Bosqui, H. D. Bowker, H. Briggs, F. W. Girdler Brown, C. Browne, J. N. Bulkley, A. G. Burden, W. W. Bush, T. P. E. Butt, E. W. Buxton, W. Calder, J. M. Calderwood, P. Carter, Dr. Catling, D. Christopherson, C. Cock, J. F. Cook, M. H. Coombe, W. F. Cosser, J. Cowie, J. W. B. Graggs, W. Cullen, H. W. Curling, H. Leslie Daniel, W. W. Dashiell, J. Hubert Davies, E. Davies, Fred H. Davis, W. H. Dawe, R. Dodman, D. Drury, T. A. Dryden, J. A. Durie, Earls, H. Eckstein, C. T. Elliott, J. Dowel Ellis, M. I. W. Ellis, T. Farris, E. Farrar, G. E. Farrar, W. J. Foster, H. P. Fraser, W. Gau, O. T. Gibb, J. G. Gibson, R. G. Given, F. Goodwin, R. B. Greer, W. Haig, D. F. Hall, W. T. Hallimond, J. G. Hamilton, R. Hamilton, H. S. Harger, H. L. Harland, H. E. Harris, R. Heine, Dr. Hendryx, R. W. Hodges, H. Hofmeyr, W. L. Honnold, R. Hosken, C. H. Hutton, G. Imroth, W. Ingham, E. C. Izod, J. M. Jackson, E. Jahr, J. Johns, Dr. G. L. Johnson, E. H. Johnson, T. Johnson, McA. Johnston, R. Jones, G. Kennedy, H. Kestner, C. Klendgen, C. E. Knecht, R. Langdon, J. E. Lanyon, H. Laret, E. J. Laschinger, J. G. Lawn, C. D. Leslie, P. Linklater, A. Lloyd, F. Lunnoell, J. McG. Love, J. MacInnes, J. C. MacKowen, W. Maus, H. B. Maxwell, S. McChesney, J. McCracken, A. W. McGregor, J. F. McGuire, C. McMillan, P. Mettenberg, H. Miller, Moor, C. E. Moore, W. J. Morcom, Z. W. Morton, J. Munro, H. Newberry, A. D. Newman, Prof. J. Orr, P. B. Osborn, A. S. Ostreicher, C. B. Pattrick, G. Pattrick, W. J. Pitchford, J. H. Piton, R. G. C. Pitt, J. A. Pitts, W. A. Pitts, C. M. Polmear, S. R. Potter, F. Prior, G. Richardson, P. Richardson, J. H. Rider, A. Rodger, C. H. Rogers, L. C. Rogers, C. O. Schmitt, Schorkorpf, F. W. Searle, J. H. Shillito, W. Skinner, Smith, G. Stephen, F. O. Stephenson, J. D. Stevens, E. J. St. John, A. W. Stockett, F. Stokes, F. C. Sturrock, H. Taylor, R. M. Taylor, W. T. Temby, W. A. Tester, H. Thomas, W. Thomas, Prof. Thompson, Dr. L. G. Thompson, W. Thompson, Tillard, A. M. Tippet, M. Torrente, H. P. Townsend, S. T. Tregaskis, J. A. Vaughan, W. B. Veale, J. Vincent, Vincent, W. B. Waite, A. Wallace, J. Wallace, W. Wallace, J. W. Warren, R. C. Warriner, E. J. Way, C. Webb, G. Webber, E. G. Weyhausen, B. G. Whitecombe, W. L. White, J. Whitehouse, A. C. Whittome, H. B. Wilkinson, L. B. Wilmot, C. E. Wilson, J. H. Wilson, H. N. Wood, W. H. Wood, J. A. Woodburn, E. Woodman, P. Woods, J. B. Woodworth, J. A. Yule. Mr. W. L. Honold proposed the toast of The Mining Industry, to which Sir George Albu, Bart., responded. Mr. E. J. Way proposed "South Africa," and Mr. H. Hofmeyer responded. Mr. J. G. Hamilton, M.V.O., President of the Chamber of Mines, proposed the "Institution of Engineers," and the President responded. The toast of "Our Guests" was proposed by Mr. J. A. Yule, vice-president of the institution, and responded to by Mr. J. Munro. Mr. W. Cullen was entrusted with the toast of the President. The arrangements were admirably carried through by the following committee :—Chairman, Mr. F. H. Davis (president); Mr. J. A. Vaughan (past president), and Mr. J. A. Yule (vice president), and the secretary (Mr. A. C. Whittome). The speeches are dealt with elsewhere in this issue.

Romola Nigel.

The following extracts are from the manager's report for the month of March on operations on the Rhodesian property:—Crushed, 546 tons from "Claydon" Mine, principally from development rock; cyanide, 315 tons treated; total recovery, 278 ounces fine gold, which realised £1,171 7s. 5d.

The Viking Mine.

In our last issue we stated that in the Viking property the quartz reef occurred in granite. We now wish to make a correction. The statement should have read that the reef occurred in a granite contact.

Rhodesian Mines Trust.

The Rhodesian Mines Trust, Ltd., issues a report for the year to September last, showing a loss of £1,762, a result solely due to the stagnation in mining markets. The company has increased its holdings in Rhodesian mining companies, and now holds a large interest in the Asp Gold Mining Company, Ltd., which is developing claims of great promise, situated in the Mazoe district. A three-quarters interest in the Shamva East, Ltd., is owned, and as the claims are situated next to the Shamva they may be said to have promise. Development is proceeding with satisfactory results. Other claims are held, upon which work is now being concentrated. Shares in other companies are taken into the balance sheet at cost, £70,547, and on the market taking a favourable turn the directors should quickly be able to convert scrip into cash at a handsome profit.

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THE DISCUSSION ON THE RAND ACCIDENT RATE.

Blasting Certificates and the Standard of Work—Interesting Views.

At the meeting of the Chemical, Metallurgical, and Mining Society, last Saturday evening, the final discussion took place on Mr. J. Chilton's paper on "Accidents in Transvaal Mines: with special reference to falls of ground." Mr. Tom Johnson said that the Eight Hours Act in Britain could not be said to have produced an increased death-rate—in fact, in 1911, when the Act was put into force, there was the lowest death-rate per 1,000—viz., 1·18 per 1,000—which represented a decrease of 30 per cent. on the figures for 1910. The figures for the Transvaal for last year were the lowest on record. He dissented from the opinion that the causes of the high rate of accidents were hustle, the introduction of new men, or changes. These things accounted for little in the matter where white miners were being considered. Accidents would always occur in mines because of unforeseen circumstances, but it would serve a good purpose if the cause of every accident was ascertained.

Mr. J. Moyle Phillips read a long contribution to the discussion. Much had been said of the miner's incompetency. There was no adequate teaching system on the Rand; men became miners how they could. The rising generation afforded no hope, for no mother would permit her son to follow the trade which killed his father of phthisis in a few years. Having averred that the shift-bosses on the Rand were as good as those elsewhere, and expressed the opinion that various mines in other places were far and away more dangerous than those on the Rand, Mr. Phillips went on to deal with the issuing of blasting certificates. He knew cases where a carpenter had secured a certificate simply by reading up the regulations, and a scrap-iron merchant had himself declared that he obtained a blasting certificate through "literary efforts." The introduction of blasting certificates had not raised the standard of work one iota; there was no guarantee that the holder was a capable or a practical man.

Mr. H. Stadler put forward a proposal for the establishment of a committee to consider the advisability of standardising grades. It was intimated that the matter was receiving the attention of the Council. The same member complained that a paper submitted by him to the Society had been rejected.

Transvaal Coal Trust.

The directors of the Transvaal Coal Trust, Ltd., intimate that the preliminary public sale of stands in the Brakpan Township, held in Johannesburg on the 16th inst., together with subsequent private sales during the past two years, have resulted in the disposal of 116 business stands and 22 residential stands for the total purchase price of £27,276. Sales have been effected on the usual terms, involving the payment of a cash percentage and periodical settlements, plus 6 per cent. interest on the amount ontstanding in respect of the balance, transfer being given against the final payment. The company has received an intimation from the Railway Administration that the Brakpan Station, situated within the area of the township, will be opened for traffic next week.

New Heriot.

At the New Heriot during the quarter ended March 31, 31,880 tons of ore were crushed. The revenue, including £2,786 of gold from accumulated sands and slimes, totalled £64,389; the working expenditure, £36,965 (23s. 2d. per ton): working profit, £27,424 (17s. 2d. per ton); the gold revenue declared £4,278; and the capital expenditure £2,431.

On development, driving, sinking, etc., 525 feet were made. The mill crushed 31,800 tons, from which 14,704.201 ozs. of gold were obtained, and from accumulated sands and slimes 664.813 ozs. The total revenue from current working was £64,389. In the quarter's return there is also included 1,021.515 ozs., the value of which is £4,279, thus bringing the total revenue for the three months to £68,668. Working costs absorbed £36,965, or 23s. 2s. per ton, which left a profit for the quarter of £27,424, or 17s. 2.457d. per ton. Including the declared reserve, the total profit was £31,703. On the 17th January the company's large compressor broke down, and steps were immediately taken to replace it. The accident and its probable results were cabled to London for the information of shareholders. The erection of a new compressor (which was fortunately obtained promptly from the coast), was expeditiously accomplished. and the machine was running satisfactorily by the end of February.

Wolfram Demand.

The importance of wolfram for the electric industry has considerably increased since Professor Dr. J. Meyer, of Berlin, discovered a method of extracting scandium earth from wolfram, after Professor G. Eberhardt, of Potsdam, had succeeded in proving by spectral analysis that scandium earth, which has hitherto been believed to be extremely rare, is present in substantial quantities in the wolfram of the Saxon Erzgebirge. One of the properties of this rare earth is that it greatly improves the incandescent body of the Nerst lamp when added to its component parts (yttrium and zirconium earths).

Ebenezer Diamond Mine.

At the Ebenezer Mine, a large amount of work has been accomplished in two months. All the machines which it is intended to instal are practically completed, and it is possible the first crushing and washing will take place on or about the 26th of this month, when it is anticipated some of the directors will be present, and it is hoped to commemorate the event by a suitable official function.

Legal Decisions Affecting Mines.

OLIFANTS TIN DISCOVERIES: AN ACTION FOR DECLARATION OF RIGHTS.

In the Transvaal Provincial Division of the Supreme Court on the 10th instant and following days, before the Judge President and Justices Wessels and Smith, the action Olifants "B" Syndicate v. H. de Jager was heard. This was an action in which the plaintiffs claimed a declaration that a certain discovery of tin made by the defendant in the Waterberg district was made on behalf of the plaintiff syndicate; alternatively, a declaration that the defendant made the discovery in the course of his duty as an agent of the syndicate, and that the syndicate was entitled to all rights and benefits accruing therefrom. Mr .E. Esselen, K.C., and Mr. N. J. de Waal for the defendant. After a protracted hearing judgment was given last Thursday in favour of the syndicate. In delivering judgment the Judge President said on the question of the relationship between the parties the position taken up by De Jager was not clearly stated, but it seemed to come to this, that he was a perfectly independent man, that he had a contract with the syndicate upon certain farms, but for the rest he took no instructions from them. On the other hand, the contention of the plaintiffs was that De Jager was engaged on behalf of the syndicate, that he made up his mind, after having viewed the properties, to assist the syndicate, he would then get a certain share in the farms and would become a member of the syndicate in all future farms which they might secure; that it was eventually agreed that he was also to be paid for any special services rendered, and was to be paid a certain salary. His Lordship came to the conclusion that the story of the plaintiffs must be accepted. The Court must be guided by the conduct of the defendant, and it seemed that he clearly understood he was going to devote all his time and energies to the syndicate's business. He was not only a member of the syndicate, but a paid agent thereof. On the question of abandonment, there was conflict of evidence, but it had not been proved. In order to do so, it must be shown that rights were abandoned with full knowledge. It was clear that at the date in question the syndicate did not know and were not in full possession of the facts. If so, there could not be any question of abandonment. On the question whether the syndicate was entitled to the discovery, the law, although difficult of application, was plain. The contract of a partnership must be based on good faith. The purpose of the partnership was to prospect for tin and to acquire all possible rights. That being so, there was no doubt the discovery fell within the scope of the partnership. The plaintiffs were entitled to the benefits of the discovery made by the defendant.

THE WEEK IN THE SHAREMARKET.

Keeping Steady Without Much Business.

The volume of business done this week has been very small, and the tendency has been towards quietness. Realisations from the other side have damped whatever little ardour remained here, and until better news is received from Paris no improvement is likely here. Tin stocks, however, are perceptibly harder, and a move in diamond syndicates was indicated by some enquiry for Frank Smiths. In the general opinion no great activity or interest in the market can be expected here before the season of the mid-year dividends.

	* Friday, 19th.	* Sat., 20th.	* Monday, 22nd.	* Tuesday, 23rd.	Wed., 24th.	Thurs. 25th.
African Farms ...	16 6B	16 6	16 6B	16 3B	16 6B	16 9
Adair-Usher Process	1 0B	1 6S	1 6S	...	1 6S	1 6S
Aurora West ...	8 0S	...	...	...	...	...
Apex Mines ...	38 6B	38 9B	38 0B	39 0B	40 0B	41 6B
Bantjes Consolidated	21 9B	21 3B	21 6B	21 6B	21 6	21 3
Benonis	6 6B	6 8	6 9B	7 0	7 0	7 0
Bushveld Tins ...	1 0B	1 1	1 0B	1 3	1 3	1 2B
Brakpan Mines ...	62 0B	61 6B	61 0B	...	61 0B	64 6B
City and Suburban ...	51 0B	51 3	51 0B	51 0B	52 0	51 0B
City Deeps	57 0	56 0B	56 0	55 0B	58 6B	58 3
Cloverfield Mines ...	5 2	4 10B	4 9B	4 10B	5 0B	5 1B
Cons. Langlaagtes ...	22 6B	22 0S	22 3	22 3B	22 6S	22 3B
Cons. Main Reefs ...	19 6	19 6	19 3B	19 9	20 3B	20 6
Cinderella Cons. ...	22 6B	23 0S	...	...	...	...
Coronation Freeholds	0 7B	0 7B	0 7B	0 6S	0 7S	0 7B
Con. Investment ...	...	22 0B	22 0B	22 0B	22 0B	...
Concrete Cons. ...	11 0B	...	11 0S	12 0	11 0B	11 0
East Rand Cent. ...	8 4	8 0B	8 0B	8 0B	8 0B	8 3B
East Rand Coals ...	2 5B	2 5S	2 5B	2 5S	2 5	2 5B
East Rand Deeps ...	2 7S	2 6B	2 6B	2 6S	2 6B	2 6S
East Rand Props. ..	66 0B	65 0B	66 0	65 6B	66 3B	66 0B
East Rand Deb. ...	£93½	£94	£94½	£95	£95	£95
Eastern Gold Mines	2 0B	2 0S	2 0B	2 0B	2 0B	2 0B
Govt. Areas... ...	25 3S	25 0	25 0B	25 6	25 9	26 0B
Glencoe (Natal) Colls	6 0B	...	...	6 0B	6 3B	6 0B
Glynn's Lydenburgs	...	...	...	...	...	28 0B
Glencairns	...	5 0S	4 0B	4 0B	5 0S	5 0S
Ginsbergs	...	...	...	...	...	28 0B
General Minings ...	20 6B	20 6B	...	...	...	...
Jumpers	10 0S	...	10 6S	12 0B	12 6B	12 0B
Jupiters	12 0S	12 0B	12 0	12 0B	12 6S	13 0B
Kaalfontein Diamonds	0 8B	0 8B	0 8B	0 8B	0 8S	0 7B
Klerksdorp Props. ...	3 3S	...	3 0S	3 3B	3 3S	3 4B
Knight Central ...	14 9B	14 0B	...	14 3B	15 0B	15 0
Lace Props.	3 3B	3 4	3 3B	3 3S	3 3	3 3B
Lydenburg Gold Farms	9 2S	9 0B	9 2B	9 1	9 1B	9 1B
Luipaardsvlei Estates	8 0	...	8 0S	8 3B	8 0B	8 3B
Main Reef Wests ...	28 3B	28 3B	28 6	27 0B	28 6	28 6
M.R. West Deben...	£100	£100	£100	...	£100	£98
Modder B's	56 6B	55 3B	...	55 0B	55 0B	53 9
Midas Deeps ...	0 10B	0 10B	0 9S	0 9	0 9	0 9
Middelvlei Estates...	2 0B	2 0B	2 0B	...	2 0B	2 0B
Modder Deeps ...	30 0B	...	30 0B	...	30 0B	30 0B
Natal Nav. Colls ...	...	15 0B	15 0B	...	...	15 0B
New Eras	7 3B	7 4S	7 0B	7 0B	7 0B	7 3B
New Kleinfonteins ..	30 0B	31 6	30 0B	30 0S	31 0B	31 0B
New Rietfonteins ...	10 6B	10 8B	10 6B	10 6	10 0B	10 0B
New Unifieds ...	...	...	...	16 0B	16 0S	...
New Boksburgs ...	1 7B	1 9B	1 6S	1 9S	1 9B	1 9B
Nigels	...	...	...	...	...	...
Orange Diamonds ..	1 9B	1 9B	1 11S	2 0S	1 9B	2 0S
Pretoria Cement Co.	54 0	53 6S	54 0B	55 0B	55 6B	55 0B
Potchefstroom Est....	...	...	...	1 6B	1 6S	1 6B
Paardekraal Estates	...	1 0S	1 0S	1 0S	1 0S	...
Premiers Deferred	180 0	...	...	...	170 0B	180 0B
Premiers Preferred	...	170 0B	...	...	...	170 0B
Princess	11 6B	11 0B	10 0B	11 6B	...	...
Rand Nucleus ...	...	3 0	3 0S	3 0B	...	3 0B
Randfontein Estates	31 0	30 0S	30 3B	30 6B	30 9	31 0B
Randfontein Deeps...	...	...	...	3 6B	3 6B	3 6B

B Buyers. S Sellers.

	Friday, 19th.	Sat., 20th	Monday, 22nd.	Tuesday, 23rd.	Wed., 24th.	Thurs. 25th.
Rooiberg Minerals ..	32 6B	32 3B	32 0	31 6	31 6	31 9B
Rand Collieries ..	...	...	...	8 0B	...	9 0B
Rand Klips	6 1	5 11	6 0B	6 2S	6 0S	6 0
Ryan Nigels ..	...	4 0B	4 0B	4 0B	4 0B	4 0S
Rood. Durban Deeps	25 0B	25 0B	25 0B	25 0B	25 6B	...
Salisburys	...	2 0B	...	...	...	...
Simmer Deeps ...	4 0B	4 0B	4 0B	4 0B	...	...
South African Lands	4 8	4 7B	4 8B	4 7B	4 7B	4 7
S. Randfontein Deeps	3 10	3 9S	3 8B	3 8S	3 6B	3 9B
Sub Nigels	6 0B	6 0B	6 0B	6 3	6 0B	6 0B
S. A. Breweries ...	39 0S	39 0S	39 0B	39 0B	...	39 6S
Springs Mines ...	13 9B	13 6B	...	13 6B	14 0	...
Trans. G.M. Estates	44 0B	41 0B	43 9S	43 6B	44 0B	43 6B
Temple Tins	3 0S	...	3 0S	3 0S	2 9	2 10
Trans. Coal Trusts...	41 0B	40 6S	40 9B	41 0	40 0B	41 0B
Tudors	2 0S	2 0S	...	2 0S	2 0S	1 0
Trans. Cons. Lands	...	...	...	30 0B	30 0B	32 0B
Van Ryn Deeps ...	20 6B	20 3B	20 6B	20 9S	21 0B	21 3
Village Deeps ...	...	42 6S	...	43 0B	43 0B	43 6B
Vogel. Cons. Deeps...	...	...	...	...	0 6S	...
Witwatersrands ...	57 6B	58 0	56 0B	56 0B	57 0B	60 0S
Wolhuters	22 9S	22 0B	22 3	22 3B	22 9B	23 0
Witbank Collieries...	42 6B	42 6B	42 6B	42 6B	42 6B	43 0
Wit. Deeps	...	...	53 0B	53 6B	54 0B	55 0B
West Rand Est. ...	...	...	2 9B	...	2 9B	...
Zaaiplaats	41 0	39 0S	42 6	42 6	41 6B	43 0

B Buyers. S Sellers.

French Bobs.

In the Supreme Court of South Africa (Transvaal Provincial Division) on April 15th, before the Hon. Sir John Wessels, in Chambers, application was made for the recognition of a certain receiver in bankruptcy appointed at the instance of the English debenture-holders of the French Bobs Mines, Ltd. On the motion of Mr. Taylor, for the applicant, Mr. Peat was recognised as receiver, notice of the recognition to be given to a certain Mr. Eales.

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Electrical Notes.

THE TROUBLES OF CABLES.

Important Discussion Before the South African Institute of Electrical Engineers.

[By J. S. Ross, Associate Member of Council of the South African Institute of Electrical Engineers.]

"In submitting these few notes, I make no attempt at a criticism on the author's most useful paper (Mr. A. E. Gibbs). They are simply a few hints which may help those who have not yet experienced similar troubles. In dealing with the laying of cables, both the author and Mr. Elsdon Dew refer to the importance of the efficient bonding of lead and armour, particularly with reference to mine cables. There are many reasons why mine cables should receive special attention, reasons which are evidently not fully appreciated by some mine authorities, judging by the lack of provision for cables in shafts and drives. As many are doubtless aware mine cables are made use of as hand rails, lamp and candle holder suspenders, pipe and drill rests, etc., while timbermen and pipe fitters often remove clamps and other fittings, sometimes even going so far as to disconnect the earth wires. I know cables where not only has the serving been worn off, but the armour has been worn by being used as supports in climbing ladder-ways. Such being the case it is obvious that great care should be taken in installing and earthing these cables. When earthing mine systems, one should remember, in addition to the points already mentioned, that water mains are constantly being disconnected and diverted, and are not always to be relied upon for continuity; and that the resistance and vitality of underground workers is greatly decreased by atmospheric conditions, and in cases of shock assistance is difficult to obtain. I am of opinion, therefore, that cables should be earthed at several points; that the use of joint and terminal boxes with wiping glands should be insisted upon, this type of box having the additional advantage of making the bonding of lead and armour an easy matter.

Regarding earth plates, the acidity of mine water presents difficulties. In one instance I know of a copper plate 30in. × 30in. × ¼in. was placed in a water duct and when examined three months later it was found to have diminished to 20in. × 16in. × 1-16in. I was able to get better results with the next one installed by tinning it thickly with coarse solder. In another instance, which may be of interest, showing as it does that water columns are not to be depended upon for continuity, the column was used as the return for the telephone system. After a repair to the column, it was found that at certain periods the telephone service failed, and that these failures coincided with the emptying of the column before starting up the pumps. It was found on examination that in making the new joints, the red lead filling used formed a layer round bolts and under washers, and that consequently there was no metallic connection.

Another detail worthy of consideration is that in passing cables through timber, holes should be made sufficiently large to prevent fraying the serving and exposing the armour, as I have frequently seen armour severed by corrosion in such cases. This, in one instance, led to serious results, as a timberman while repairing the shaft, removed a number of holding clamps, and there being no armour to sustain the suspended cable, it parted, and 500 feet dropped down the shaft, injuring two natives and doing a considerable amount of other damage.

I shall be glad if in his reply Mr. Gibbs would suggest the best method of dealing with a case similar to the following:—A paper insulated cable carried through a shaft for 200 feet, passed through a chamber terminating with an end box in a link cage. Twelve months after installation it was observed that the terminal box and porcelains were covered with an exudation of matter resembling cylinder oil, which, upon investigation, proved that the temperature of the chamber was such that it dissolved the impregnating compound, which in turn dissolved the bitumen compound in the terminal box, being eventually drained out through the porcelains, the result being that the insulation of conductors became slack and spongy. While on this subject I should like to point out that where terminal boxes are fixed in the vicinity of steam pipes, or fixed to iron walls exposed to sun rays it is not good practice—although common—to use paper insulated tails, as the heat from these sources causes the impregnating compound to drain into the box and force out the sealing compound.

Another common practice which leads to trouble is the insulating of sealing bands and tail joints in these boxes. With reference to the filling of joint and terminal boxes, I consider excellent results can be obtained by the following method:—With the terminal boxes collar the porcelains with paper or clay, screw a funnel into the plug hole, and before pouring in the sealing compound, heat both box and funnel with a blow lamp. The additional pressure attained by this method reduces blow holes and cavities to a minimum. A suitable funnel can be made with a piece of ¾in. steam piping and a 3in. to ¾in. reducer.

In support of Mr. Elsdon Dew's contention that insulation tests are not always to be relied upon, the writer submits for inspection two pieces of conductors taken from a 2,000 volt cable, punctured by a heavy surge. That this cable was affected was uncertain, but it was assumed, and when tested for insulation in the ordinary manner the result was infinity. Not being satisfied, a pressure of 2,000 volts was applied, with still no sign of a fault; the pressure was increased to 2,500 volts, and after 10 minutes electrification it arcd across: with a pressure increased to 3,000 volts, in 20 seconds it broke down. On this occasion the fault was located by sound. It is obvious that had the insulation test been relied upon the first increase of potential over normal working would lead to further trouble. Although not the general practice I am of opinion that all cables should be tested at a pressure of double their normal working, before being put into commission.

How important attention to detail in mine installations is, is evidenced by the following facts taken from a Home Office report on accidents in British Coal Mines. The report covers the period of January, 1905, to January, 1911, and shows that electric shock was responsible for 53 accidents and 55 deaths. The cause of these accidents were shown as follows:

	Accidents.	Deaths.
Absence of, or inefficient earthing	22	24
Defective insulation of cable system	20	20
Contact with uninsulated live parts	9	9
Miscellaneous causes	2	2

In the Hebburn Mine, New South Wales, accidents from electric shock were so prevalent that the mine was shut down and a Commission appointed to enquire into the matter.

Examples such as these should impress upon us the fact that efficient earthing of cables and electric equipment is of more importance than conductors, and it is our daily duty in the interests of life and limb, as well as of the profession, to see that all possible precautions are taken to prevent such occurrences.

Professor W. Buchanan (Hon. Treasurer): I have not written out any criticism of the author's excellent paper, but as he invites members to state their experiences with cable faults, I take the opportunity to mention the following examples that may be of interest to the younger members. The sketch illustrating a modern method of filling a junction-box, reminds me of a case where the box was installed at the top of a hill, therefore having the cables sloping downwards on each side. The cable was lead-covered, concentric insulated with jute impregnated with resin dissolved in resin oil. The box was filled with compound in the usual manner, but when examined by an inspector three days afterwards, the box was found to be quite dry, and was therefore filled up again. About a month later it was again discovered to be empty, and as there was no doubt about it having been filled before, it was concluded that the compound escaped along the cable. Refilling at regular intervals showed that a diminishing quantity of compound was taken each time until after a few months, saturation seemed to be reached, no more leakage appearing. Another example occurred many years ago at Larne, Ireland, where some cables were put down for alternating current arc lighting at 2,000 volts. They were only 7-16 inch diameter, single core, lead covered, without any protective covering, and laid three feet in the ground on top of a layer of sand that was spread over the bottom of the trench to a thickness of about three inches, with a board 4 by ¾ inches placed over the leads. A few months after the cables were thus laid some faults occurred, and when the frequency of breakdown became serious, I had to ascertain the cause. It was found that near the faults the lead covering had many small scratches and abrasions, some of which penetrated into the insulation, thus allowing moisture to cause an earth from the conductor to the lead. It appeared that the rain, percolating to the sand, gradually washed it from underneath the cables, when the pressure of earth forced them and also the board down to the bottom of the trench, where the lead came into contact with numerous stones. This by itself would hardly account for the faults developing so quickly, but the eddy currents in the lead sheath due to the 100 ~ current would at times appreciably heat the cable, causing expansion of the lead, while, when the current was switched off every night, it would contract on cooling, and the movement at certain parts would be sufficient to cause the observed cutting of the lead. It was finally decided to take up all these cables and replace by concentric and armoured. It may be of further interest to mention that when the faults were located by the loop test, the results were found to be in error by from twenty to thirty yards, the reason being that in making so many joints by cutting out faults and inserting new pieces of cable, the slack introduced made the cable longer than the linear measurements indicated, but with experience the necessary allowance was readily made. The only other incident that I wish to mention refers to a very special class of cable the Ferranti trunk mains used to transmit 10,000 volts from Deptford to various sub-stations in the West of London. They were made in lengths of about 20 feet, and consisted of concentric copper tubes, insulated with impregnated paper, the whole being protected by iron piping, being therefore devoid of flexibility. These were laid for a considerable distance on the side of an embankment of the S.E. Railway. In the day time the heat of the sun would expand the pipes, while the cooling by night or by a shower of rain would cause contraction, thus opening some of the joints sufficiently to admit moisture to the insulation. The resulting fault did not usually develop at once, but the lights would go down momentarily, due to a heavy overload coming on the system; this would occur with increasing intensity and at diminishing intervals until the fuse blew. Frequently this took place within one hour of the first indication, but sometimes the cables would appear all right for some days afterwards, and if it were attempted to break down the fault by running on a separate machine to a pressure above normal, there was no certainty that the main would break at the particular place desired. The reason for this effect seemed to be that, owing to the very thin film of moisture first penetrating to the inner conductor, the resistance of the fault was so high that only sufficient current passed to evaporate the small quantity of moisture present, but in doing so the insulation got slightly carbonised, so that a greater quantity of moisture could enter the second time, and the resulting fault have a resistance lower than before. After a few discharges the charring of the insulation reduced the resistance sufficiently to pass a current capable of blowing the fuses. If the rain or deposition of dew ceased, the dry fault would continue to have sufficient resistance to prevent sensible leakage current passing.

Mr. J. W. Kirkland: I happened to be calling in at the Robinson Deep Mine the other day and saw an example of what seemed to me to be an exceptionally severe short circuit in a three core 2,000 volt underground cable. Mr. Bentley, the chief electrician, said that the result of the fault was that he could not get any voltage at the far end, nor could he get any loop test. There was a complete lack of continuity between the three phases. He had to put kafirs on to dig, and after a great amount of digging (because one always begins at the wrong end), he found that the three conductors were so completely fused and burnt out that it was as if one had taken a draw knife and scooped a great hole in the cable, without even leaving any copper plating on the insulating walls.

The President: There is one little point in cable work to which I might draw attention, which has been brought to my mind by the sketches on the blackboard, and that is, not only the necessity of properly filling all joint and end boxes, but the difficult nature of doing it. Unfortunately, somehow or other one does not seem able to get hold of a filling compound which will not shrink in cooling, and, after one has filled up the boxes thoroughly, as one would think, using a vent at one hole and a filler at the other, it is found that, after putting the plug in, and letting it stand for several days, the compound will sink in the box. I had a case at the Greenwich Power House—of which I showed you some illustrations a month or so ago—of one of the end boxes of a cable bursting and shutting up the station for some time. It was found on investigation that the compound had shrunk in this box to such an extent as actually to expose the joints in the conductors. Whether moisture had got in or not, I could not tell. Of course, the usual result of an explosion is to take away all evidence of the causes of the fault. I do not know it myself, but I was reading the other day of an invention by Mr. Dickinson, Engineer to the Corporation of Leeds, who has designed a special box which can be filled properly. My advice to those who have end boxes in their charge is to open them now and then, take out the plug and see whether they are full or not. One may come across some astonishing results, when it is done.

Electrical Method of Cultivation.

A British immigrant to Canada who is taking up a farm at Chatham, Ont., proposes to use electricity for the cultivation of his produce. The electrical system which he is going to put into operation is already producing splendid returns, he says, in the South of England and in France. Briefly, it is to heat the soil by means of underground wires. These, carrying electricity and generating heat, are laid at 5 ft. apart and 1 ft. underground, 25 miles of wire being required for 20 acres of ground. The heat thus diffused is carefully regulated, and its effect is to force an astonishing growth of vegetables and fruit. It is far more effective for forcing, he declares, than the glass-house system, and invariably enables garden produce to be ready for the market from one to three weeks earlier than by any other means, ensuring good prices. The cost of the electric power is small, and in Ontario, in the regions covered by the service of the Hydro-Electric Commission, it is, no doubt, smaller than in most places.

Electrical Smelting of Tin.

The experiments on a large scale in the electrical smelting of tin carried out in Cornwall during the past summer by Mr. J. Harden, for the Gröndal Kjellin Co., Ltd., of London, are the complement of the researches of Mr. J. F. Maclaren, initiated in London in 1909, and later of Dr. Walmsley, at the Northampton Institute. Although they used inadequate and extemporised appliances, the results of the experiments of these two gentlemen sufficiently attested the technical and economic feasibility of electric smelting, which has since been abundantly confirmed by Mr. Harden's more extended operations. The novel lines of the blast furnace used have not been divulged; the only detail which has transpired is that it is fitted with three carbon electrodes, 203 × 203 mm. and 1·5 m. in length, with corresponding holders and regulating arrangements. The results of the process are briefly as follows:—The yield of pure tin is with the electric furnace continuous from the beginning; no skilled labour is required, as with the ordinary process; the creation of "hard slag" is avoided, and the output is greater—up to as much, in some cases, as 99·75 per cent. Experiments begun on a small scale, and gradually enlarged, showed that with a purity standard of 96 per cent. of tin, the weekly consumption of energy was about 2,200 kw.-hours, and in single instances only 1,700 kw.-hours, per ton of tin, which might even be lessened, by special arrangements, to 1,400 kw-hours. The current used was three-phase 50 cycles at 650-670 volts, stepped down to 30, 40, 50 and 60 volts.

Mechanical and Electrical Engineers' Examination.

The Commission of Examiners for Mechanical and Electrical Engineers' Certificates of Competency will hold the next examination on Tuesday, Wednesday, and Thursday, the 21st, 22nd, and 23rd May, 1912, at 9.30 a.m., at the South African School of Mines and Technology, Eloff Street, Johannesburg, and also at Dundee, Bloemfontein, and Kimberley. The prescribed form of application for examination is obtainable, without payment, by applying to the Secretary to the Commissions of Examiners, P.O. Box 1132, Johannesburg. Those wishing to enter for the examination must send in their applications to reach the Secretary by the 6th May, 1912. The following syllabus of examination is published for general information, and a detailed copy will be supplied on application to the Secretary. Candidates will be examined in the following subjects:—Mechanical Engineers: Legal knowledge, strength of materials and design of structures, power plant, driven machinery and mechanical appliances, electro-technics (elementary). Electrical Engineers: Legal knowledge, strength of materials, power plant, driven machinery and mechanical appliances, electro-technics (advanced). Candidates for examination as mechanical or electrical engineers to take charge of machinery on mines will, in addition to the above subjects, be examined on "Mining Plant."

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CAPE INSTITUTION OF ELECTRICAL ENGINEERS.

Peninsula Electricity Supply.

At the meeting of this society, which took place on Wednesday last at the South African College, Mr. Long, chairman-elect, gave the following interesting address :—It is usual with our institution for a presidential address to take the form of a review of the progress in electrical science geoerally, dealing more particularly with the latest deveopments. The subject has been dealt with so often by an abler pen than mine, and there have been no extraordinary developments during the past twelve months, that it occurred to me a review of the electrical industry in the Cape Peninsula since the inception of electric supply here might be of some interest to members of this local section, more especially when considering the developments in the public supply which have recently occurred and are about to take place. The earliest use of electricity for lighting purposes that the author has been able to obtain evidence of, appears to have been carried out at the Cape Town Railway Station and the Docks, in 1882. It is not surprising to hear that at this early date only arc lamps were used, supplied with energy from two 10 ampere constant current Brush arc lighting machines, installed in a building in St. Andrew's Square, by the S.A. Brush Electric Lighting Co., which it is presumed was a small subsidiary company of those old pioneers, the Anglo-American Brush Electrical Engineering Co. In addition to eight lamps installed at the Railway Station, the following premises were also lighted : Gaiety Bar, one outside and two inside; Standard Bar, one outside and two inside; Central Hotel, one outside; Fountain Hotel, one outside; Cafe at top of Adderley Street, one lamp; two shops in Longmarket Street, one lamp each. As the generators were long series arc lighting machines, it is presumed that these lamps were in series with those at the Docks and Railway. In the year 1886, the company was

BOUGHT UP BY THE HARBOUR BOARD,

who removed the generating plant to the Dock area, and shortly afterward added to the generating plant a 25 K.W. Mordey alternator. About this time the Harbour Board took over the lighting of Parliament House, which from 1885 until this date was supplied from a direct current steam-driven generator placed in a building in the grounds adjoining the Public Library, and it is interesting to note that the supply between the Docks and Parliament House was transmitted by means of alternating current at 2,000 volts on bare wires up St. George's Street. The same system of transmission was adopted for the lighting of the new and old Somerset Hospitals, which were also supplied from the Docks, although the latter was not undertaken until as late as 1894. This original plant in the Docks was running as late as 1903, when it will be remembered by most of you the new Dock Power Station, alongside the Graving Dock, was completed. The Railways were supplied with energy from the Harbour plant for light Cape Town Railway Station until 1889 when the present Railway Electrical Department was inaugurated.

TRAIN LIGHTING.

It is interesting to note that the first work undertaken by the Department took the form of train lighting; the suburban trains being lighted by means of accumulators in short vans, coupled to the end of the train, and of course taken off in the daytime for charging purposes at the headquarters, Salt River Works. This system was inaugurated in 1890. During the same year Salt River Station (then much nearer the works than the present junction) was lighted, also by means of a 100-volt battery of accumulators. In 1895 the headquarters of the Railway Electrical Department were removed to Capetown, and a small central station installed. Mather and Platt D.C. dynamos, driven by Davey-Paxman engines of 150 h.p. were provided for charging accumulator vans; and in addition to this plant, Brush constant current arc lighting machines were installed, together with a Mordey alternator. In 1897, owing to it being considered that the H.T. wires in St George's Street were dangerous, Parliament House was supplied from the Railway Power Station by means of a concentric cable. The Corporation at the time being short of plant, and therefore unable to undertake the supply. In 1898 and 1899, the plant was extended by means of Mordey alternators, direct coupled to Westinghouse engines, but the latter proving unsatisfactory, were removed in 1900 and replaced with Davey-Paxman engines driving the alternators by means of ropes. By this time the railway load had been considerably increased, all stations as far as Rondebosch being electrically lighted, in addition to Valkeenburg Asylum. In 1904 the long series arc lighting system gave way to short series; eleven lamps being run across 550 volt D.C. machines direct coupled to Belliss engines of 100 and 200 K.W. respectively.

PUBLIC SUPPLY.

The first public electric supply in the Cape Peninsula was that inaugurated by Messrs. Edlin and Stevenson, who secured certain concessions from the municipalities in the southern suburbs. The original plant installed was at Rondebosch, and consisted of four Jehnson and Phillips Knapp D.C. dynamos, belt driven by two Marchall steam engines. The total plant capacity was 44 K.W., the system of distribution 3-wire 220 volt across the outers, and the price per unit charged to consumers 1s. 9d. In 1893 the Capetown and Suburban Syndicate acquired the municipal concessions, and installed at Rondebosch alternating current, removing their D.C. plant to Wynberg. In the year 1900 the Cape Peninsula Lighting Company was formed to take over the affairs of the syndicate. In 1901, 50 K.W. was added to the Wynberg Station, consisting of Parson's steam turbine direct-coupled to two 25 K.W. dynamos each 220 volts (tandem set). In 1903 the old plants at Rondebosch and Wynberg were shut down, and the generating station at Claremont started operations. This plant consisted of : One Parsons' steam turbine direct-coupled to 3-phase alternator, 3,300 volts, 50 periods; two Parsons' steam turbines direct-coupled to direct-current machines, each 135 K.W.; one tandem set from Wynberg (alluded to before); total 455 K.W. capacity. The statistics available as regards the early years of the suburban electric lighting enterprise are unfortunately very meagre, but it is ascertained that the units sold in the year 1896 (four years after the inception of the undertaking) totalled about 68,000. In 1911, the units sold reached 329,000 roughly.

CITY OF CAPETOWN.

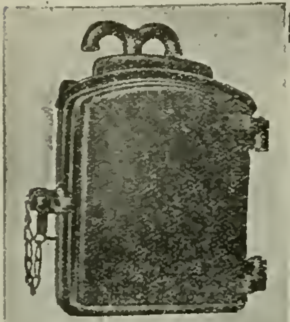
The delay in starting a public supply of electricity in the City of Capetown, which as many of you will remember took place as late as 1895, was unfortunate, at any rate in one respect, namely, it gave our friends the Gas Company a considerable start. Anyone connected with the public supply of electricity will agree that to-day, in spite of the much reduced cost of electric lighting brought about by the reduction in charges, together with the use of metallic filament lamps, there are many householders who still use gas, owing to the initial cost of installing electric light. Had the Corporation been in the field a few years earlier the users of electricity for domestic lighting would be considerably larger to-day. Saturday next, the 13th inst., is the 17th anniversary of the official opening of Capetown's original central station near the Molteno Reservoir by the Mayor, Mr. George Smart. The idea of lighting the city by electricity originated with the late Councillor Chevalier T. J. O'Reilly, K.S.G., C.M.G., J.P., but it was mainly due to the exertions of the then Councillor Sir D. P. De V. Graaff, M.L.A., when Mayor of the City, that the scheme was undertaken. Mr. Smart, upon the occasion of the inauguration of the works, stated in his speech that the idea of lighting the city with electricity was also mooted by Mr. Gamble, who advised that a reservoir should be constructed upon Table Mountain, and also by the late Sir John Woodhead, who advised the tunnel from the reservoir. These waterworks having been carried out, a resolution was brought forward in the Council providing for the use of the hydraulic power available, by installing an electric lighting system. Mr. Smart stated that he could claim for Sir David Graaff that, from the time that resolution was adopted, he set himself to work to carry it out. A majority of the Councillors were turned to his way of thinking, and the result was that a tender for the works was accepted, and the contract given to Messrs. Siemen and Halske, of Berlin. At a meeting of the Council held on the 28th March, 1895, it was unanimously resolved to associate the name of Sir David with the electric lighting system by designating the same the " Graaff " electric lighting works.

SYSTEM AND PLANT.

The system adopted was the then well-known low-tension fire-wire distribution system, lighting current being supplied at 110 volts between any two adjacent wires, and the 440 volts between the two outside wires being used for the supply of current to motors. This was changed to a three-wire system during 1897, current for lighting being then supplied at 220 volts; the supply for motors remaining 440 as before. The original plant comprised two multitubular boilers, manufactured by Messrs. Simonis and Lanz, of Frankfurt-on-Main; two continuous current shunt-wound dynamos, with external armatures, of 150 K.W. capacity each, by Messrs. Siemens and Halske; two 200 h.p. vertical cross compound engines, by Messrs. Kuhn, of Stuttgart, and two 200 h.p. Pelton wheels, by J. M. Voitch, of Wurtemburg. By means of special clutches the dynamos were driven either by the Pelton wheel or steam engines, water for the former being supplied from the reservoir on Table Mountain. In the early stages of the undertaking, the steam plant only was used, water being unvailable, but owing to this water power only being sufficient at any time to drive one dynamo, it soon became necessary to use both steam and water together. The current generated at this station was conveyed by means of trunk mains to the Dorp Street distributing station, where feeders were run to different parts of the City. A battery of 1,400 amperes capacity was also installed at Dorp Street, and was provided by Messrs. Siemens and Halske in their original contract. The whole of this generating plant is still in existence, although the only portions now in operation are the turbine-driven plant at Molteno.

DORP STREET STATION.

In the early part of 1898 it was found necessary to extend the plant, and in consequence the site in Dorp Street was converted into a generating as well as a distributing station. At this station 300 h.p. was installed; comprising two loco. type boilers, by Clayton and Shuttleworth, of Hyde; one 200 h.p. Bumpsted and Chandler, Crompton high speed, direct-coupled, continuous current set, and two 50 h.p. steam balancers of similar design. Of this plant, the 200 h.p. set has since been used at Dock Road, but is at the moment being removed to make way for a 2,000 k.w. turbo-alternator. At the same time two separate machines were installed at the Molteno generating station, being driven by means of ropes from the existing engines in order



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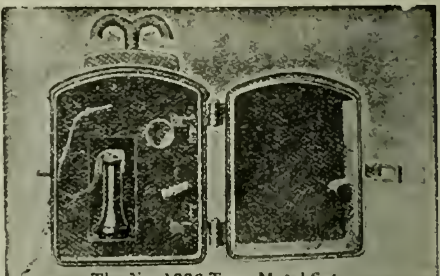

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that the whole steam plant might be utilised in conjunction with the available water power. Towards the end of 1900 still further extensions were carried out, four Davey-Paxman boilers being installed in a temporary wood and iron shed near the site of the present power house. The generating plant in this shed, which was put up temporarily owing to the phenomenal increase in consumption, comprised two 500 h.p. high-speed tandem compound engines, manufactured by Sisson and Co., of Gloucester, direct coupled to direct current machines by Messrs. Johnson and Phillips. Owing to the great and growing demand, a Belliss and Morcom engine, direct-coupled to a Mather and Platt generator, was also installed in the temporary shed in the early part of 1903 . This has, of course, been removed, and is now running in the Dock Road power station.

CENTRAL POWER STATION.

The present Central Power Station in Dock Road was officially opened on April 14, 1904, curiously enough only one day off the anniversary of the original station . The plant is well known to most of you, and, in any case, as it follows standard practice for units of the size installed, hardly requires description.

KALK BAY.

The next and probably the last Municipility in the Cape Peninsula to open a generating station for the supply of electricity, was that of Kalk Bay. The electrical undertaking was inaugurated jointly with the drainage scheme, the sewage of which has to be twice pumped. The plant was installed in August, 1907; the capacity of same being 300 k.w. and the approximate area of district three square miles; the furthest point supplied being four miles from the works. At present the plant is worked for about 13 hours per day. Next year it is proposed to run continuously, but from August, 1907, to January, 1910, the plant was only worked seven hours daily. The following table shows the number of units sold during the past three years, and also the estimated units sold in 1913, with increased load :—

Period covered.	Units sold.	Consumers.
July, 1908, to June, 1909	35,870	41
July, 1909, to June, 1910	44,508	64
July, 1910, to June, 1911	66,910	117
Estimate for 1913	225,000	550

Number of consumers to date, 210.

Up to the present there has been no extension to generating plant at Kalk Bay. From the date of the official opening of the Dock Road power station until 1903, there were no extensions other than the adoption of mechanical stokers, but during the above year, after considerable negotiations, the then Government of the Cape Colony and the Capetown City Council came to an arrangement by means of which all the requirements of the former, both at the Docks, Railway, and Post Office, should be supplied from the Dock Road power station.

PLANT IN THE PENINSULA.

At this stage it is interesting to sum up the plant at the various central stations in the Peninsula. We had no less than seven central stations, not including Camps Bay, between the Docks and Kalk Bay, the aggregate of which totalled approximtaely 6,600 kilowatts, delivering some 7,000,000 units to the various consumers. To allow for distribution losses, assume 8,000,000 units generated, that is to say, the load factor on the whole of the plant installed was only about 14 per cent., in spite of the fact that the tramway power station load factor on plant installed was about 25 pre cent. Leaving out the trams and dealing with lighting alone, the load factor was only 10 per cent. To undertake the combined load of the Railways, Docks, and Post Office, the Council installed two additional generators of 400 k.w., one of which of which has been found for the requirements, including Seapoint; whereas the plant discarded by the Government amounted to over 2,000 k.w. During the two years that the Government's requirements have been generated at Dock Road, the consumption of the two departments has increased nearly 60 per cent. above what it was during 1908, whereas the increase in Capetown public supply between 1904 and 1908 was only 18 per cent. The above increase of 60 per cent., I may say, has been mainly taken by the consumers of Capetown, Seapoint, and Woodstock, and goes to show how beneficial such a combination is to all parties concerned.

COMING CHANGES.

As you are all aware, great changes are about to take place in the electric supply in the southern suburbs. Wynberg has made arrangements to be supplied from Kalk Bay, and it will be seen from the statistics of the latter's undertaking that its output will be increased by approximately 230 per cent., and this, I understand, can be undertaken without increasing the generating plant. Mowbray, Rondebosch, and Claremont will shortly be supplied from the Dock Road power station, and it is interesting to note that although the total units sold in these three municipalities only run into a little over 200,000 per annum, the taking over of the area by the Capetown Corporation has made it possible for prices to be quoted which will lead to an additional sale of energy from the transmission lines to Claremont of some 2,250,000 units. In fact, it is estimated that as the result of this combination with the southern suburbs and Capetown the Dock Road power station will increase its output to 9,000,000 units in 1913, as against an estimate for this year of 6,000,000. To provide for this extra load I may say that an additional 400 k.w. alternator at the power station would be ample to supply all the requirements from Seapoint to Kalk Bay; but for reasons of all-round economy it has been decided to instal a 2,000 kilowatt turbo alternator and a 1,000 k.w. rotary converter, which under normal conditions will supply the whole requirements of the Peninsula from Seapoint to Claremont, at any rate, for the next two years. The total plant installed will still be less by about 500 kilowatts than the total installed in the Peninsula for purposes other than tramways in 1908, and at the same time will include 100 per cent. spare, in view of the fact that the present reciprocating plant will only be used as a stand-by. If anyone has any doubt of the economy that must follow a combination of the various electrical undertakings in the Cape Peninsula, the above figures are, I hope, sufficient to place the matter beyond such doubt. Finally, gentlemen, it would appear, in view of these recent developments, that the electrical industry in the Cape Peninsula is now likely to make rapid strides, which I sincerely hope will be to the benefit of all those interested therein.

DIFFICULTIES OF AMALGAMATION.

In proposing a vote of thanks to Mr. Long for his interesting address, Prof. Bohle pointed out that the most noteworthy point was the existence of eight power stations within about eight miles' distance, and each with a different type of plant, making an amalgamation almost impossible. In spite of this, unification had taken place and the price of energy for light had been reduced under Mr. Long from 1s. 2½d. to 9d. down to 6d. for large consumers. It was to be hoped that before long we should have only one power station supplying the whole Peninsula, and even the towns beyond up to Stellenbosch, Paarl, and Wellington. To-day, it was possible to transmit energy over almost any distance at reasonable cost, and distances of 30 miles were considered small. At the same time he considered the pressures used in the Transvaal were too high for the areas supplied, because the cost of maintenance increased with the rise in pressure, especially in the Transvaal, where lightning troubles frequently occurred. The saving in copper with the increase in the transmission pressure might very often be more than counterbalanced by the saving in maintenance with a lower pressure. However, these points might be considered on the merits. Of importance were the unification of all existing power stations, which, as Mr. Long had shown us, would enable the Corporation to sell electricity at much lower prices than those in vogue to-day.

Mr. Vaux seconded the vote of thanks, which was received with acclamation. Amongst those present were also Mr. Jeffries, City Engineer; Mr. Harrison, Chief Engineer, G.P.O.; Mr. Bankly, Tramway Manager; Mr. Simpson, Mr. Rosser, Mr. Tarlton, Mr. Cooke, Mr. Drakes, and many others.

Union Electric Co.

The Johanensburg selling agents to the Union Electric Co., Ltd., have recently carried out a very complete electrical installation for lighting, heating and power at the new premises of the "Rand Daily Mail," Johannesburg, current being taken by duplicate feeders from the municipal supply. The lighting installation consists of approximately 590 incandescent lamps and 10 arc lamps; the heating installation provides for 100 kw. throughout the different offices, consisting of Union Electric Co. convectors of from 5 kw. to 2 kw. each. The power installation totals 120 h.p., the principal motors being of 45 h.p. each, used for the large printing machines. These motors are of the interpole D.C. type, 460-500 volts, and are designed for a speed regulation from 100 to 1,200 r.p.m. Speeds from 100 to 600 are obtained by means of series resistance in the armature circuit and the higher speeds by resistance in the shunt. The output of the two printing machines is 50,000 newspapers per hour between them. The controllers are of the tramway pattern, and they are fitted with no-voltage release. Other motors of 5 h.p. are used for the linos, and other auxiliary machinery. Altogether some 10 miles of wire have been used in the wiring of the building. Among other contracts recently carried out by the Union Electric Co., of which Mr. H. W. Curling is the Johannesburg manager, is a motor-driven centrifugal pump for the Rand Water Board. The motor was of the Union Co.'s make, giving 130 h.p. on 2,000 volts 50 cycle three-phase, and included a liquid starter and H.T. control panel. The pump was by the Pulsometer Co., England. The Union Co. have also in hand the contract for the arc lighting of Messrs. Chudleigh Bros., drapery establishment in Johannesburg, consisting of 96 lamps, 48 being of the Excello pattern, rated for 10 amperes, and burning four in series on 230 volts. The remaining 48 are of the open type, rated for 8 amperes, also burning four in series. All the lamps are fitted with the Union Co.'s "Kandem" coupler for purposes of lowering the lamps, by which ropes, winches and pulleys are eliminated. An order has just been placed with this company for 100-s.p. double quick-break switches of special design for the Johannesburg Municipality feeder boxes. Further installations by this company are of large three-phase motors for the Johannesburg Brick and Pottery Co., and three-phase motors for the City and Suburban Gold Mines, also single-phase motors for the Johannesburg Municipal Sewage Pumping Station.

Coal in Central Africa.

Indications of coal are reported to have been discovered near Albertville, on Lake Tanganyika. Coal has also been discovered elsewhere in the Katanga, at Shiwa and Luweisha, on the Upper Lualaba, and in the country crossed by the Lubudi River and by the Lovoi River, two western tributaries of the Upper Lualaba River. The Shiwa coal has no calorific value, and as to the Lubudi and Lovoi coal, there is no news as yet as to its value. Lignite (brown coal) has been discovered in Katanga, on the south-west of Lake Mwero.

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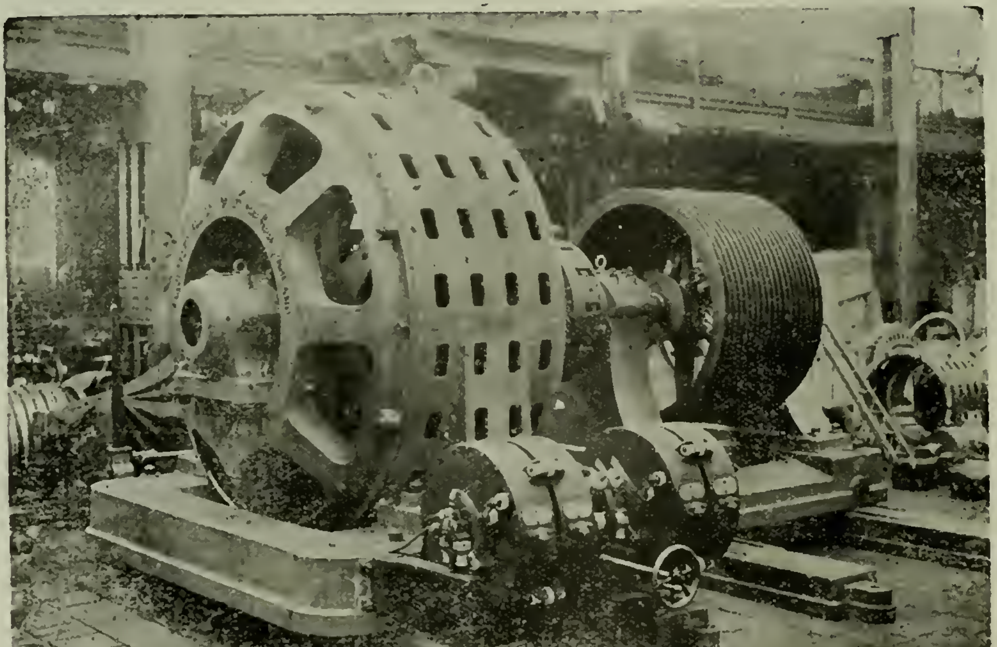

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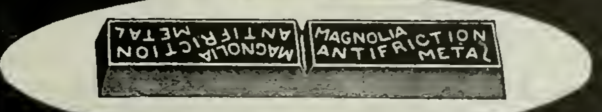

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Engineering Notes and News.

Victoria Falls and Transvaal Power Co.

It is reported from Berlin that the quotations on the Exchange for the debentures of the Victoria Falls and Transvaal Power Company, of which an extensive holding is in German ownership, have recently experienced a slow decline. A Berlin newspaper learns from quarters closely associated with the company that the fall in price is connected with the circumstance that consideration is being given to the question of the company's new capital requirements.

The Coming of the Age of Oil.

There is in London at the present moment (says the *Westminster Gazette*) the man whose researches are destined to bring about the greatest change in power production since the steam engine was worked out. Dr. Diesel lectures at the Institution of Mechanical Engineers, and what he has to say will attract the more public and scientific attention, because for the moment the production of coal in this country has ceased. It is a significant fact that twenty years ago this quiet, thoughtful-looking man, with grey hair and eyes that twinkle through spectacles, was regarded as little better than a charlatan. Engineers, even in his own country, spoke of his invention with contempt. Dr. Diesel has lived that down, and has had an ample revenge. To-day he is a rich man, with the possibilities of untold wealth ahead of him. Engineers in Europe and America are competing against one another in the production of his engines. The navies of the world are eagerly experimenting with Diesel motors, commercial vessels have been fitted with them, they are driving electric lighting and other plants, a beginning has been made in using them as locomotives. All this Dr. Diesel foresaw and predicted years ago, but he had the sanguine spirit of the inventor. He knew the wonder of what he had done; he did not realise how long it would take him to conquer the world. In another age miners and coal owners would probably have combined to destroy the engines of Dr. Diesel, as the operatives of Lancashire broke up the early spinning jenny. For here is the man who is going to sweep away the terrors of a coal strike and make it impossible for the industry of the land to be stilled at the behest of one trade. He looks forward to a future in which the crude oils of the world will be furnishing the motive power for the greater part of the works, and supplies will be drawn from vast areas in every continent. He has a dream of the Colonies developing rapidly by the aid of fuels drawn from vegetable products. If you talk to him of the wonders that petrol has done he will smile and say, "There is not enough petrol to run the great industries. You may use it for a few light industries, perhaps, but you must utilise your crude oils if you are to have the cheap power essential to manufacture on the large scale. Of crude oil there is an almost illimitable supply." Even as you have a vision of the English coal-fields deserted and silent, Dr. Diesel reassures you. He has come not to destroy the coal trade, but to conserve the supplies. The British Isles have little natural oil, but Dr. Diesel is prepared to get the oil upon which his engine works from coal itself. We use coal in the most wasteful manner. He would have us effect enormous economies, and defer still further the day when our coal-fields shall be exhausted. Instead of using coal direct in steam engines we will, in the future which Dr. Diesel predicts, distil from it the tar and tar oils, which can be utilised by the Diesel engines, and finally employ the coke for heating and metallurgical processes. In these ways every ton of coal will be made to yield far more work than in the past. We shall be consuming our fuel scientifically and completely, instead of wasting nine-tenths of it, as is now done.

RHODESIAN ENGINEERING NOTES.

At the Bell Mine a double-sheave steel headgear has been erected over the new vertical shaft. It is of modern design, and has just been completed. Wooden headgears, it is interesting to note, save on small tributing mines and propositions in the initial stage of development, are rapidly going out of favour in Rhodesia. All the larger mines of the country, such as the Globe and Phœnix and Giant, are now equipped with steel pit frames, and many of the less important propositions are purchasing steel structures in place of the wooden frames hitherto used.

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Although a temporary breakdown of the Nissen gravity stamps at the Claremont Mines affected the returns for February, the mill ran 21 days, and the stamps are said to be giving satisfaction. We understand that one or two other Rhodesian mines are considering the installation of Nissen heads.

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At the Globe and Phœnix a considerable amount of construction work is proceeding. Three tube mills are being erected, and additional roasting furnace plant is approaching completion. The present equipment of the Globe and

Phœnix consists of 40 stamps and pans, and with the addition of the new plant the company will not only be able substantially to increase the tonnage crushed, but will also secure a better extraction, especially from the gold-bearing stibnite ores.

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At the Empress Palmeira Mine, of the South African Prospecting and Concessions Company, the new machinery has been thoroughly tested, and the results of the trial runs are reported as being quite satisfactory. The new hoisting plant is in operation, and the rock drills ready for work. There has, however, been some trouble and delay experienced in regard to the delivery of drill steel. As soon as orders are complied with, the drills will be got to work, and development will rapidly be pushed ahead.

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A new slimes plant is being installed at the Gaika Mine. A generating plant is also being put in. Both these are expected to be running next month.

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Messrs. Fraser & Chalmers are equipping the Agnes Mine for Mr. P. S. Triggs. The plant to be erected includes a five-stamp gravity mill (each stamp of 1,250 lbs. falling weight), a Marshall engine, Marshall hoist, and 30 h.p. Marshall boiler, with Hadfield crusher, Frenier pump and Knowles' sinking pump.

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The Rhodesian Refractory Minerals Process Company, Ltd., have completed their experimental metallurgical plant at Gadzoma, and are now prepared to receive parcels of ore for testing purposes. The company has recently been carrying out tests on a bulk sample from the New Found Out Mines.

Coal in Madagascar.

Coal has been discovered towards the southern part of the island of Madagascar, in the valley of Onilahy, eighty miles from the port of Tulear. The quantity is recognised as important, and the quality is known as "boghead," analagous to the beds worked in the Transvaal and in Natal. This kind of coal is employed largely in the gold quartz mines in South Africa. The Government has decided to lease the properties in the Janapera Valley, an effluent of the Onilahy. The transport of the coal will be effected by barges for the present, later a railway or a canal will be constructed should the output be of importance.

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Finance, Commerce, and Industries.

Building Plans.

Eight municipalities in the Transvaal Province during the month of March approved plans having an estimated value of £136,477 as against £143,701 for the month of February, showing a decrease of £7,224, and seven municipalities in the Cape Province approved plans having an estimated value of £32,270.

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Roodepoort Proposed Loan.

At the forthcoming meeting of the Roodepoort-Maraisburg Town Council it will be recommended that the Finance Committee be authorised to negotiate with the Administrator for an additional loan of £38,000 on the basis of the existing loan of £20,000, for the purposes of the electric light scheme, water district scheme, abattoirs, etc.

* * * *

Trade with the Congo.

The Association of Chambers of Commerce has received a letter from the Department of Commerce stating that it has been brought to the notice of the Government that a considerable amount of credit has been allowed by South African and Rhodesian firms to traders and others in the Belgian Congo, and that firms should be careful to ascertain the character of the men with whom they are dealing, or of the men whom they appoint as their agents there. The Department is advised that though the British Vice-Consul at Katanga cannot give any information as to the financial status of any firm, he will be pleased to help firms as much as he can.

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Commercial Travellers' Samples.

The Railway Administration has adopted the recommendation of the Johannesburg Chamber of Commerce that the privileges provided for commercial travellers by clause 123 of the Tariff Book should also apply to managers and partners travelling as canvassing representatives of their firms. The General Manager informed the Committee that the experience of the Railway Administration went to show that the weight of 63 lbs. per cubic foot given for Jarrah timber in the Tariff Book was considerably under the average actual weight; and the opinion of the Chamber was asked as to a proposal to include Jarrah with the timbers grouped at 70 lbs. per cubic foot. In agreeing to the proposed amendment of the Tariff Book, the Committee reminded the General Manager that alterations of this character are always inconvenient to merchants, by reason of existing contracts, and for this reason it was urged that at least three months' notice should be given before bringing such alterations into effect, so that merchants may be saved from unnecessary loss.

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Customs Interpretations.

Attention is called to the following rulings and interpretations of the Customs Tariff: Add to list of approved boiler compositions appearing on page 260 of the official Tariff Book, "Anti-Lithon" Boiler Composition. "Beaver Board" (a substitute for lath and plaster), item 175 (15 per cent.). "Compo Kettle" (for melting and filtering printers' roller composition), item 98 (a) (3 per cent.). Disinfectants, add to approved list of, "Runlets" Sanitary Fluid. Fat Liquor (for dressing leather), item 175 (15 per cent.). "Feroda" (a friction surface lining for machinery), item 175 (15 per cent.). "Gammeter Multigraph" Printing Machine, item 175 (15 per cent.). Potash-Muriate of, item 175 (15 per cent.). Add to list of approved boiler compositions, page 260 official Tariff Book, "Cameronia" Boiler Composition. "Chrome Mordant" (for tanning), item 150 (free). "Full Cream" milks, add to list of, "Valley Star Brand" Swedish Cream. Grain Dressing (Hayward's Carbolised), item 117 (3 per cent.). "Grains of Paradise" (Guinea Grains or Melegueta pepper), item 35 (2½d. per lb.). Potash-Muriate of, item 154 (free). "Blo," an electric apparatus for hair-drying, etc., item 175 (15 per cent.). Drenching Bits (for administering medicine to horses), item 175 (15 per cent.). "Full Cream" milks, add to list of approved brands, "Valley Star Brand," "White Star" Swedish Milk and "Little Nurse Brand." Nicotine Fibre, Bentley's (for fumigating), item 117 (3 per cent.). Sirolin (a medicine), item 36 (b) (per imperial gallon, £1). Steel Wire (for reinforced concrete), item 175 (15 per cent.). Aluminium sheet or plates, item 175 (15 per cent.). Ambulance sleighs, item 175 (15 per cent.). Bate (for tarring), item 175 (15 per cent.). Bottle covers of corrugated paper (printed on or unprinted), item 175 (15 per cent.). Disinfectants, add to approved lists, page 264 official Tariff Book (a) Sanitas Carbolic Powder; (b) Carbolic Powder A; (c) Sanitas "Oko" Powder; (d) Sanitas Bactox Powder; (e) Quibell's Sanitary Powder. "Full Cream" milks, add to list of, "Springbok" Brand. "Liebicia" (a cask-cleansing solution), item 175 (15 per cent.). "Oildag" (a lubricant), item 175 (15 per cent.). "Printograph" (a multiple typewriter), item 175 (15 per cent.).

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The Labour Market.

The report of the Inspector of White Labour states:—Amongst the more important works in progress is the Johannesburg Municipal Town Hall, the main tender accepted, subject to possible reductions, being £293,938. The structural steelwork at the New Market House is nearing completion. The building is about 670 feet long with a roof-span about 38 feet, containing nearly 500 tons of steel, the cost of which, erected, is about £22,000. The contract for the masonry, brickwork, carpentry, etc., is now placed—contract about £54,000—and will give employment to a good number of tradesmen for some time to come. The Young Men's Christian Association building is now commenced. Contract in the neighbourhood of £25,0 Mosenthal's Building is being erected by the same contractor, costing about £50,000. The work has also been given out and excavations started for the new Union Club. Cost of the building will exceed £30,000. The labour supply is equal to the demand.

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Rand Water.

At the meeting this week of the Rand Water Board, a report was presented by the Finance and General Purposes Committee as to the water supply account for 1911-12. It appears that after working costs have been provided for, a sum of £2,450 will be carried to the reserve fund. It was originally estimated that the water sales for the year would reach an average of eight million gallons a day. This figure was well maintained during the first half of the year, but, owing to a falling-off in the water supply from the Zwartkopjes district, the quantity sold during the second half-year fell away to 7·45 million gallons a day, reducing the average daily quantity sold for the whole year to 7·87 million gallons. The estimates for the current financial year are based on the assumption that the sale of water from the Board's sources of supply will amount to 8¾ million gallons during the first half, and 9¼ million gallons during the second half of that year. The quantity of water which is now available from the Board's sources is estimated as follows: Zwartkopjes sources, 3½ million gallons a day; Zuurbekom, 4½ million gallons a day; Springs district, 2 million gallons a day; other sources, ¼ million gallons a day; making a total of 10¼ million gallons a day. From this figure has to be deducted the quantities used on works, lost in distribution, and through other sources of wastage, estimated at 500,000 gallons a day, leaving a maximum saleable quantity of 9¾ million gallons. It is proposed to apportion the municipal contribution to the Board's fixed charges in respect of the six months ended March 31 last, amounting to £50,480, as follows: Johannesburg, £42,245; Germiston, £2,273; Boksburg, £1,515; Krugersdorp, £2,042; Roodepoort-Maraisburg, £1,203; Benoni, £951; Springs, £248; total, £50,480.

Railway Spending Programme.

The estimates of loan expenditure recently presented to Parliament by the Minister of Finance contained under the heading of Railways and Harbours an item of £4,910,000 for railway and harbour works in progress or proposed, as more fully set out in the estimates of capital expenditure on railways and harbours administration. The latter were laid on the table of the House by the Minister of Railways on Monday, and give details as to how the £4,910,000 is made up. The general summary is: New programme, 1912-1913, and balance of authorisations as at January 31, 1912, respectively. New lines (new proposals) and completion of lines under construction, £2,157,838 and £3,161,105. New works on open lines, £1,993,000 and £1,135,021. Rolling stock, additional, *nil*, and £921,185. Harbours, £337,000 and £267,360. Working capital, £47,000 and *nil*. Totals, £4,534,838 and £5,484,671. This gives the total proposed programme from February 1, 1912, of £10,018,509, of which £495,855 was spent between February 1 and March 31, 1912, leaving £9,523,654 to be spent during the financial year 1912-1913, or thereafter, as follows: For the financial year 1912-1913 and subsequent to March 31, 1913, respectively: New lines and completion of lines under construction, £2,500,000 and £2,574,918. New works on open lines, £2,160,000 and £737,574. Rolling stock (additional), £450,000 and £471,185. Harbours, £365,000 and £217,977. Working capital, £35,000 and £12,000. Totals, £5,510,000 and £4,013,654. Of the new programme of £2,157,838 a sum of two millions is set down for new lines, of which no details are given, leaving £157,838 for new programme for lines already authorised and under construction, made up as follows: Port Elizabeth-Avontuur, £3,000; Ceres Road-Ceres, £18,400; George-Oudtshoorn, £90,776; Lady Grey-Gairtney, £3,835; Llewellyn-Franklin, £30,055; India Junction-Alberton branch, £1,001; Komatipoort-Tzaneen, £6,300; Umlaas Road-Mid-Illovo, £4,197; Howick railway, £2,874. The details of new programme on harbour expenditure, £336,000, are: Table Bay, £127,347; Knysna, £6,960; Algoa Bay, £11,223; Mossel Bay, £5,911; Buffalo Harbour, £68,103; Port Natal, £91,220; Walfish Bay, £500; Port Nolloth, £700; Life-saving appliances, £5,000; contingencies, available for unforeseen expenditure under any of the above-mentioned sub-heads, £90,036.

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Cape Manufacturers' Congress.

A congress, which is being held under the auspices of the South African Manufacturers' Association, opened during the week at Port Elizabeth. The Transvaal Manufacturers' Association was not, however, represented, as the work of the South African Association is in reality confined to the Cape Province. Several matters of interest to the inland manufacturers will, however, come up for consideration. The following was, *inter alia*, on the agenda:—To be moved by Mr. A. Jackson, Port Elizabeth: "That in the interest of manufacturers of harness, saddlery, boots and shoes, and other leatherware, who are not carrying on a business of tanners at the same time, it is of the utmost importance that the duty on leather remains as at present." To be moved by Mr. D. F. Mobbs, and supported by Messrs. Cuthbert & Co. and Mr. W. Playdon, Port Elizabeth: "That the duty on boots, shoes and leather remain as at present." To be moved by Mr. Denford, Port Elizabeth: A resolution regarding duties on shop fittings, etc. Mines and Works Act.—Introduced by Executive Committee: "That this congress of manufacturers, whilst recognising the need for Government supervision of machinery and boilers respectively, protests against a number of regulations which have been framed in connection with the Mines and Works Act, 1911, as being totally unsuited to the conditions under which factories are operated, and requests their immediate amendment." Importation of Skilled Artisans.—Introduced by Executive Committee: "That with a view to encouraging industrial expansion within the Union, and recognising that there is a shortage of skilled labour in many industries, this congress of manufacturers urges the Government to at once take steps through the Agent-General to inform oversea artisans that there is occupation at good wages to be obtained in South Africa; and further for the purpose of encouraging men of character and ability to settle here, the Government be requested to grant assisted passages to wives and children of artisans." Development by Means of Commodity Rates.—Introduced by Executive Committee: "That raw materials of South African production and their manufacturers produced in one part of South Africa and not produced elsewhere in the country, shall be carried to such other parts at such railway rates as will permit as far as possible such products to compete with the like imported article." Distribution Rates.—To be moved by Mr. F. Ginsberg, Kingwilliamstown: "That distribution rates be computed on the basis of the rates from the port nearest to the sending station." Direct Representation in Parliament.—To be moved by Mr. F. Gibaud, Port Elizabeth: "That the Executive Committee take into consideration the advisability of securing direct representation of the manufacturing interests in the House of Assembly."

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A Big Undertaking.

In the *Cape Times* "M. R." writes: "Those who are for ever ignorantly barking at De Beers as the parasite of the country sucking all in and giving nothing back, would do well, provided they can obtain, as the present writer was fortunate enough to obtain, a special letter of introduction to the manager (Mr. Quinan) to visit the great Explosive Factory at Somerset West, founded in 1899, by the late Cecil Rhodes, with the avowed purpose of cheapening dynamite for the development of South African mines—an aim in which it has been so completely successful that the present price of explosives generally is half the old Nobel rates. . . . The property owned by the corporation covers nearly 3,500 acres of land, upon which are to be found not only the factory with its extensive laboratory and every variety of machine and workshops connected with the industry, even to a printing office, but also a boarding-house, a school, a hospital, bathing ponds, cricket and football grounds, etc., for the use of the employees. The wage bill among the thousand persons employed is about £10,000 a month, of which the great proportion goes to whites, though a large number of natives are employed, some of whom get as much as 3s. 8d. a day."

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Cape Town Commerce.

Mr. Jagger this week presided over the fifty-first annual meeting of the Chamber of Commerce. He declared that during the year the trade of South Africa had further increased, though so far as importations were concerned the increase was not nearly so large as in the previous year. Agriculture continued to be prosperous, despite East Coast fever and drought, and there was ample evidence that the country was advancing. Exports showed an increase of almost 3½ millions, or about 6·4 per cent., compared with the previous year. It was regrettable that this increase was produced entirely by minerals—in fact, there was a slight falling off in the total value of the exports of agricultural produce, accounted for mostly by the drop of £290,000 in maize, which was due in some degree to the fall in prices. One outstanding feature of the export trade, said Mr. Jagger, was the preponderance of minerals, which amounted to 81·8 per cent. It was not a satisfactory position for South Africa. It was not satisfactory that our national expenditure and national liabilities should be based on what, after all, was a diminishing asset. Hence it was an imperative necessity to increase the products of the land. After mentioning the pleasing expansion of trade with Rhodesia, German South-West Africa, and the Congo, Mr. Jagger referred to the small increase in the large importation of food and drink in 1911. The total in this respect was £6,336,666, an increase of 6·82 on the previous year. It was disappointing to find that, in spite of the Government's efforts in assisting agriculture, the imports of such articles as butter, cheese, condensed milk, meat and poultry all showed increases last year. On the other hand, the importations of corn, grain and flour showed the large decrease of £309,000, or 19 per cent.

Natal Manufacturers.

The second annual report of the Natal Manufacturers' Association states, *inter alia*:—"As foreshadowed in the last annual report, the labour question is growing more acute, and rapidly becoming a very serious problem. The stoppage of indentured Indian labour has increased the difficulties in this respect, and the labour now available is not sufficient to meet the demands of increasing development. One important industry has recently had to close down in consequence of this difficulty. So far as skilled labour is concerned, it is to be hoped that technical education will gradually overcome the disinclination of European youths to embark upon an industrial career, and in this respect the local Technical Institute is deserving of support. The whole labour question is occupying the attention of your committee, and a report will be presented to you in due course. Another matter which has occupied our attention during the past year has been the federation of all the Manufacturers' Associations in South Africa. The project was discussed at length at the Congress held at Capetown in December, 1910, and at which delegates were present representing Cape Colony, Natal and the Transvaal. The outlines of a Constitution were there drawn up, and afterwards submitted to the various Associations. Greatly to the regret of your committee, however, the Transvaal Association declined to be a party to the proposed Federation."

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Collection of Debts.

The Executive Committee of the Association of Chambers of Commerce has under consideration as a reference from the last annual congress proposals to the following effect, viz.: (a) That magistrates should have power in connection with certain writs to issue a garnishee order attaching not more than one-third of an employee's salary or wages until the debt is satisfied or the debtor relinquishes his position; (b) that upon a debtor removing from the jurisdiction of a magistrate's court where judgment has been obtained against him to that of another, the creditor shall be entitled, upon obtaining a return of *nulla bona* on his writ to proceed to civil imprisonment without the necessity of having to obtain a fresh judgment against the debtor, and that in the event of a defendant being successful in the court of any magistrate it shall be lawful for him to proceed for civil imprisonment against the plaintiff who has been unsuccessful without having to obtain judgment against him afresh. The Committee of the Johannesburg Chamber of Commerce recommends that the Chamber should express agreement with the second of these provisions, but it is not prepared to support the proposal to authorise magistrates to issue garnishee orders.

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Cape Manufacturers and the Customs Tariff.

This congress of manufacturers is of opinion that the Union Customs Tariff should be divided fundamentally into three schedules or classes, as follows: (1) The "Revenue Schedule," in which every item not actually specified in either of the two other schedules, shall be included. This "Revenue Schedule" to be subdivided into as many classes and at such varying rates of duty as may from time to time be deemed necessary by Parliament to meet the exigencies of revenue, thus providing the necessary elasticity for revenue purposes in regard to all the truly revenual items of the tariff. (2) The "Protection Schedule," in which every article enjoying protection should be placed, advertising thus to the world what articles are protected in South Africa, and the amount of the protection. (3) The "Reserved Raw Materials Schedule," in which should be placed all raw materials (not procurable of South African production) employed in the manufacture of articles named in the Protection Schedule. This third schedule to be divided into two sections, as follows: (a) Raw materials in their crude form (not procurable of South African production) used in the manufacture of articles named in the "Protection Schedule." (b) Partially manufactured and finished articles (not procurable of South African production) to be used as component parts in the manufacture of articles named in the "Protection Schedule." Also a clause in the Tariff Law should declare that, except under the contingency provided for in sub-section (d) hereunder: (a) The duty upon articles named in the "Protection Schedule" should not be lowered for a term of 10 years. (b) The duty, if any, shall not be raised on raw materials named in either section of the "Reserved Raw Materials Schedule," for a period of 10 years. (c) It shall be permissible, from time to time, with the consent of Parliament, to add new articles to the "Protection Schedule," and to either section of the "Reserved Raw Materials Schedule." (d) In the event of any trust, syndicate, association or combination in the nature of a trust, coming into existence, which shall create or tend to create a monopoly in the manufacture of any article or articles, whether completely manufactured as for sale to the public, or as "component parts," for sale to other manufacturers, as materials in the latter's products, then it shall be lawful for Parliament, upon petition from interested parties, if coupled with proof of injury, to either reduce the rate of duty, or to forthwith remove the item or items from the "Protection Schedule," and deprive it, or them, of all privileges of that schedule.

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Building Society Meeting.

The annual general meeting of the Johannesburg Permanent Mutual Building and Investment Society was held this week, Mr. Waldie Peirson presiding. There was a full attendance of directors, and a fair complement of shareholders. The directors' report drew attention to the fact that the amount invested on loans on property and society's shares stood at the sum of £123,727 13s. 11d.; that during the year 362 shares had matured, the amount paid out to investors being £34,635 9s., in addition to £22,961 14s. transferred to borrowers' accounts. A profit of £6,616 13s. 2d. was announced, which, together with the balance carried forward at last balance of £1,643 5s. 2d., made a total of £8,259 18s. 4d., which the directors recommend should be appropriated at the rate of 8 per cent. per annum, which would absorb £6,590 7s. 8d., to transfer £1,643 5s. 2d. to reserve, leaving a balance of £26 5s. 6d. to be carried forward. It was stated also that £12,000 was placed with the local banks on fixed deposit, £8,000 of the amount being a reserve in connection with the savings bank department.

* * * *

Alliance Society.

The report of the directors of the Alliance Permanent Mutual Building Society and Savings Bank covers nine months ended the 31st of March last. The paid up capital stands at £52,557 10s. 3d., an increase of £8,650 9s. 5d., representing 2,968 ordinary contributions and 270 fully-paid shares—an increase of 287. New shares were issued to the number of 944, while the number paid out, matured and transferred to loan accounts totalled 656 of the value of £11,875 3s. 11d. The savings bank department shows an increase of £3,405 18s. 6d., the total deposits at date, including accrued interest, being £52,085 11s. 9d. One hundred and sixty-six new accounts were opened, and there are at present 534 current accounts in operation and fifty-seven fixed deposit accounts, the average balance of the former being £66 2s. 10d. and of the latter £294 2s. 8d. By the transfer of premiums on fully-paid shares issued during the past nine months the reserve fund has been increased to £4,502 10s., the full amount being placed with the bankers on fixed deposit, bearing interest of 3½ per cent. per annum. Fresh advances were made to the extent of £22,474, and after allowing for all repayments and transfers from share accounts, the total loans outstanding amount to £99,654 12s. 6d., showing an increase of £9,124 4s. 6d. The sum of £98,396 14s. 6d. is secured by properties, carefully valued by the board at £154,648, while mortgagors have to their credit on share accounts the sum of £12,150 5s. 1d., the net loans being therefore £86,246 9s. 5d., against securities valued at £154,648. The advances against shares amount to £1,255 18s., the balances pledged being £4,271 17s. 6d. The net earnings for the nine months amount to £3,408 7s. 2d., and of this £2,897 16s. 1d. will go to shareholders in a dividend of 9 per cent. and £510 11s. 1d. carried forward.

A Prosperous Life Insurance Co.

The twenty-fifth annual report of the Manufacturers' Life Insurance Company shows that the company continues to make wonderful progress. During the year 1911 the insurance issued and revived amounted to £2,571,237 10s. 2d. Of this £1,789,377 18s. 7d. was issued in Canada, the largest home business in the history of the company, and an increase of £464,377 18s. 9d. over 1910. The insurance in force at December 31st, 1911, was £13,562,550 17s. 10d., a gain of £1,063,376 5s. 10d. for the year. The net premium income was £527,756 16s., an increase over 1910 of £29,497 8s. 7d., while the total income amounted to £671,388 1s. 1d., a gain of £46,097 5s. 2d. Payments to policy holders and beneficiaries amounted to £262,981 7s. 7d., being an increase over 1910 of £60,121 2s. 9d. The death claims for the year were very favourable. The assets at the end of the year were £3,000,342 14s. 11d., an increase of £328,847 17s. 6d. The reserves for the protection of policy holders amounted to £2,617,509 9s. 1d. After making a special reserve of £31,732 3s. 10d. for dividends payable to policy holders in 1912, the surplus, exclusive of the Shareholders' Fund, amounted at the close of the year to £228,435 1s. 2d. The deduction from reserves, amounting to £41,715 10s., allowable under the new Insurance Act for policies four years and under in force, was not taken into account in determining the amount of the surplus. The following comparisons show a record of steady progress:—Insurance in force, December 31st: 1907, £10,528,182 16s. 10d.; 1909, £11,876,307 16s. 6d.; 1911, £13,562,550 17s. 10d.; insurance issued and revived—1907, £1,195,696 12s. 6d.; 1909, £1,913,758 6s. 9d.; 1911, £2,571,237 10s. 2d.; income—1907, £499,954 18s. 11d.; 1909, £589,195 14s. 9d.; 1911, £671,388 1s. 1d.; payments to beneficiaries and policy holders—1907, £148,197 9s. 11d.; 1909, £180,101 16s. 4d.; 1911, £262,981 7s. 7d.; reserve for protection of policy holders—1907, £1,696,789 10s. 1d.; 1909, £2,198,481 6s. 11d.; 1911, £2,617,509 9s. 1d.; assets—1907, £1,943,677 10s. 5d.; 1909, £2,392,133 8s.; 1911, £3,000,342 14s. 11d.

New Companies.

Grand Theatre (Capetown), Ltd., the Grand Theatre, Market Street, Johannesburg, £3,500.
Afra, Ltd., St. Mary's Buildings, Kerk Street, Johannesburg; £1,500.
The Marico Milling Co., Ltd., Zeerust, district Marico, Transvaal; £1,500.
Gibraltar Land Co., Ltd., 24-25, Permanent Buildings, Harrison Street, Johannesburg; £200.
Fairview (T.C.L.), Ltd., Corner House, Commissioner Street, Johannesburg; £45,000.
El Oro (Transvaal) Gold, Ltd., 22, Robinson Buildings, 84, Commissioner Street, Johannesburg; £17,000.
W. Haine, Ltd., Walter Mansions, Eloff Street, Johannesburg; £8,000.
Provincial Stock Farmers, Ltd., 42, Human Street, Krugersdorp, Transvaal; £4,000.
Fez Syndicate, Ltd., second floor, Provident Buildings, Fox Street, Johannesburg; £2,000.
M.A.G., Ltd., 5, Primrose Buildings, Fraser Street, Johannesburg; £99.
Castle Tobacco., Ltd., 114, Market Street, Johannesburg; £1,500.
The Rodway and Esson Patent Automatic Inflator Co., Ltd., 9, Reserve Investment Buildings, Fox Street, Johannesburg; £10,000.
Bellevue Tins, Ltd., 199, New Stock Exchange Buildings, Johannesburg; £8,000.
Algemeene Trouw Vereeniging, Beperkt, 17 and 18, New Court Buildings, Market Street, Johannesburg; £500.
Sunday Post, Ltd., "Transvaal Leader" Buildings, Harrison Street, Johannesburg, £20,000.
Concordia Lydenburg, Ltd., New Court Buildings, 84, Market Street, Johannesburg; £1,395.
Flottmann Engineering Co. (of South Africa), Ltd., 7 and 8, Ginsberg Chambers, Main Street, Johannesburg; £5,000.
Ferguson Champ d'Or G.M. Co., Ltd., Mine Property, Luipaardsvlei, near Krugersdorp, Transvaal; £35,000.
Incambu Remedy Co., Ltd., 2, Balmoral Chambers, Commissioner Street, Johannesburg; £1,000.
The United South African Gold Mining Co., Ltd., 222, St. Andries Street, Pretoria; £1,000.

Foreign Companies Registered.

Richard Ruben, Ltd., c/o David Campbell Brown, General Mining Buildings, Johannesburg; £8,000.
Petersen, Ltd., c/o John Main, 7, Fraser Street, Johannesburg; £150,000.
Union Electric Co., Ltd., c/o Harold William Curling, 42 and 43, Permanent Buildings, Harrison Street, Johannesburg; £25,000.
First London Co-operative Co., Ltd., c/o James Donaldson, 148, Exploration Buildings, Commissioner Street, Johannesburg; £500.
The Kaffrarian Steam Mill Co., Ltd., c/o David Alison, 16-17, Sacke's Buildings, Johannesburg; £100.000.
Wm. Dawson and Sons (South Africa), Ltd., c/o Harold Thorne, c/o Wm. Dawson and Sons (South Africa), Ltd., New Club Buildings, 83, Main Street, Johannesburg; £2,000.
South African Milling Co., Ltd., c/o Clarence James Murray, Commercial Exchange Buildings, Johannesburg; £500,000.
Klipval Pongola, Ltd., c/o George Frederick Wilhelm Reinstorf, Sulphur Spring, Piet Retief, Transvaal; £15.000.
The Amalgamated Properties of Rhodesia, Ltd., c/o Houlton Augustus de Beer, 25-28, second floor, Sauer's Buildings, corner Loveday and Market Streets, Johannesburg; £750,000

Prospectuses.

The Rodway and Esson Patent Automatic Inflator Co., Ltd., Johannesburg.
Vilma Diamond Mining Co., Ltd., Pretoria.

Increases of Capital.

New Penwith, Ltd., Johannesburg; £18,750 to £30,000.
Witwatersrand Co-operative Smelting Works, Ltd., Johannesburg; £57,940 to £60,567.
Grand Theatre (Capetown), Ltd., Johannesburg; £3,500 to £4,000.

In Liquidation.

Eureka Brick Co., Ltd., Pretoria; voluntary.
Paddy Marico Exploration Syndicate, Ltd., Johannesburg; voluntary.
Main Reef Exploration Syndicate, Ltd., Johannesburg; voluntary.
Severn Estates, Ltd., Johannesburg; voluntary.
King George G.M. Co., Ltd., Potchefstroom; voluntary.
Union Coal Co., Ltd., Johannesburg; voluntary.
Bailey's Copper, Ltd., Johannesburg; voluntary.
Waterberg Gold, Land, Investment, and Exploration Syndicate, Ltd., Johannesburg; by order of Court.
Coliseum, Ltd., Johannesburg; by order of Court.

Contracts Open.

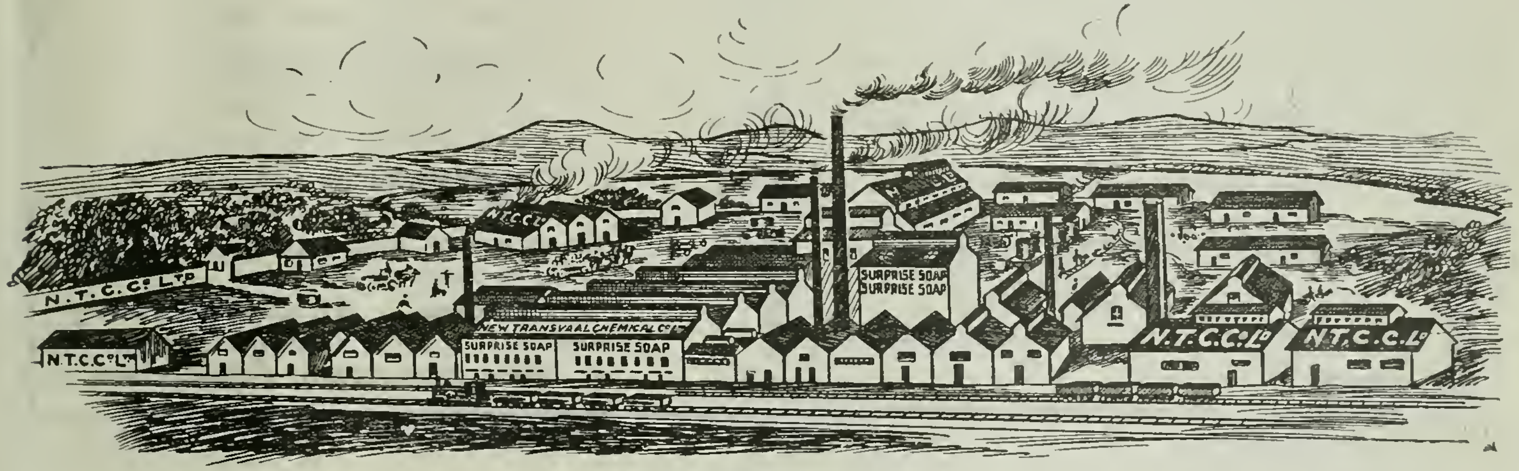
The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of fencing material and gates (May 28).
The Municipality of Boksburg invites tenders for the supply of rolling stock, converter plant, and overhead material, required in connection with trackless tramways (June 26).
The Chairman of Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for additions to Fairview Junior school Troyeville; also additions to Boksburg North School (May 3).
The Municipal Council of Johannesburg invites tenders for uniforms for tram officials (May 7); also chloride of lime (May 10); also mackintoshes (June 1); also spares for stone crusher (June 14).
The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of the following articles to the Department of Posts and Telegraphs:—540 polished walnut backboards, 37 in. x 12 in., as per drawing No. 24 D.; 370 polished walnut backboards, 40 in. x 12 in., as per drawing No. 24 E.; 150 polished walnut backboards, 54 in. x 14 in., as per drawing No. 663. Quotations must include delivery as shown below, and must indicate time within which delivery will be effected: Capetown, backboards as per drawing No. 24 D., 140; backboards as per drawing No. 24 E., 190; backboards as per drawing No. 663, 50; Johannesburg, No. 24 D., 200, No. 24 E., 150, No. 663, 100; Pietermaritzburg, No. 24 D., 200, No. 24 E., 30 (May 1); also for the supply of horse rations to the Urban Police (Cape Division) (May 15).
The Town Clerk of Clocolan, O.F.S., invites tenders for the erection and completion of a water scheme at Clocolan (May 31).
The Chairman of the Tender Board, Provincial Auditor's Office, Capetown, invites tenders for the reconstruction of bridge over the Knysna River. (May 13.)
The Municipal Council of Johannesburg invites tenders for the supply and erection of constructional steelwork in floors and roofs, etc., for the new Town Hall and Municipal Offices, Johannesburg. (June 14.) Automatic oil switches (May 2). Points and crossings for tramways (June 21). Books of coupons, wood-working machines, water piping (April 30). Motors, bitumen sheeting (May 3).
The Municipal Council of Krugersdorp invite tenders for 5,fi000 Imperial gallons of creosote (May 13).

RISING SOUTH AFRICAN INDUSTRIES: II.—SOAP AND CANDLES

Enterprise of the New Transvaal Chemical Co., Ltd., Delmore—A Praiseworthy Object Lesson in Local Industry.

As a typical study of what colonial industry can achieve, the record of the New Transvaal Chemical Co., Ltd., shows us results that firms who have had lesser obstacles in the way of progress and advancement could be justly proud of. The inception and past successes of the Company are to-day the common property of all those who are interested in the industrial development of the Union, but it is well to dwell upon those capabilities which have so far been successful in combating the numerous obstacles that all new enterprises have to overcome in a new country; and the energy, enterprise and organisation shown by Dr. Schlesinger and the directors of the company are worthy of all praise. The benefits that accrue to the country by the industries that are established therein are not, at first thought, apparent, but to the discerning mind the fact that such industries are in being is a great factor in reducing the cost of the article manufactured; because the competition engendered between the colonial and oversea manufacturers will eventually reduce the cost to the public of any such article that is required for consumption. The New Transvaal Chemical Co., Ltd., who largely manufacture soaps and candles, which are the necessities of life, are, therefore, responsible for the lowering of the cost of these articles, through their successful endeavours to compete with the overseas manufacturers. The works of the company at Delmore are equipped with the most up-to-date machinery, and are capable of turning out the very finest class of work; the staff of employees number several hundreds, and the works cover a frontage of half a mile. The employment of such an amount of labour and capital can only be considered as a valuable asset to the country, and the demand that is necessarily engendered for the raw material required for manufacturing purposes, to be grown in the country, serves the purpose of enlarging the scope of benefits that must accrue to the State.

Wherever possible, only matter and material that can be procured and grown in the country is used in the manufacture of the company's products, and it is interesting to know that a great percentage of the materials used in the finished article is locally produced; even in America (a country teeming with Nature's gifts, which are so suitable for manufactures) only some 50 per cent. of material used is of local production. The company, therefore, deserve the generous patronage of the public to support them in their efforts. For many years the company have placed on the market candles of every description and variety, suitable for every purpose—mining, household, commercial, and ornamental—and the knowledge and experience of their staff of chemists have created qualities suitable to the peculiar temperature and climatic variations of this country, and to-day their candles stand pre-eminent in value and popularity. The demand for locally manufactured soaps has been met with the usual versatility of the company, and after exhaustive experiments, with reference to the conditions of the waters of the country, soaps that have no equal are on the market. To-day their famous Surprise Soap is in use in every home, and the other brands manufactured by them are in equal demand. The exceptional capabilities the company have of manufacturing products that are essentials of use in the home, etc., have resulted in the placing on the market of a disinfectant, "Antiseptol," which, in all ways, meets the demand for such an article, and which has been proved to give satisfaction when other brands have failed. Great strides have been made in the manufacturing of artificial manures, and every class of manure has been manufactured for the special requirements of the nature of the growth and soil under cultivation. The company are willing at all times to give their help and experience in this matter to the farmer and those who are requiring information.



The Works at Delmore.

The Chemical Company have the control and working of the famous Seltzbach Springs, situated at Van der Merwe, Transvaal, and have placed the Natural Mineral Water on the market. This water has wonderful recuperative qualities, and is largely used in cases of malarial and rheumatic tendencies; that the water is of the very best quality and absolutely pure has been proved by the analysis recently conducted by Drs. J. Loevy and Pakes, Government Analyst and Bacteriologist, respectively, who describe it as being free from the slightest trace of any organic substance, and owing to the presence of natural bicarbonates, it has a palatable and refreshing taste. Anti-friction greases are another of the many varied products that have the attention of the company, and the importation of oversea greases has largely decreased since the introduction of the company's greases on the market. The consolidated efforts of the company in manufacturing has tended to the use of local natural products, which in the ordinary way are generally considered worthless, and it is the aim of the company in every direction to encourage and use any local product or industry in their manufactures. In conclusion, it is not too much to say that, in every way, the company's efforts should be seconded, because the existence of such energy and capabilities in our midst can only tend to the increasing prosperity of the country.

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FACTS REGARDING THE

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WORTH REMEMBERING.

1. The **TRANSVAAL** is producing over one-third of the World's Gold Output.
2. **TRANSVAAL** Mines have spent 24 millions sterling on machinery and plant.
3. The **"South African Mining Journal"** is the **Official Organ** of the **Mine Managers' Association.**

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Automobile Notes.

A Legal Decision Affecting Motorists.

A case of peculiar interest to motorists was decided during the week in one of the local courts, in which a motorman in the employ of the Tramway Department was charged with recklessly driving a car, or at a speed in, or a manner which was dangerous to the public. He was further charged with failing to comply with the direction of a pointsman to stop to permit of cross traffic. The prosecution broke down on the evidence of a municipal representative, who took exception to the charge on the ground that a tram-car was not illegal within the meaning of the Section, in which the word "tram-car" was deleted in the revised by-law of 1906. Despite the police evidence, which went to show that the signal given to the tram-driver was disobeyed, resulting in a collision with a trap, which was damaged, the accused was discharged. It goes without saying that a gross miscarriage of justice typifies this particular case, which has created quite a mild sensation in motorist circles, and conjecture is rife as to who will foot the bill for damages when an automobile sooner or later figures under similar circumstances to the trap involved. The magistrate's decision, to which much justified exception is taken, will doubtless be responsible for a wide-spread agitation in the interests of the public safety, as the position which the present case has disclosed is certainly unique in the public life of the place, and intolerable to a large degree. The fact that a tram-car is permitted to career at a break-neck speed over important street inter-sections, without due regard and consideration for other road users, and in deliberate defiance of the officials who endeavour to control the traffic, simply renders the specific duty devolving on the familiar pointsman as little short of a *reductio ad absurdum.*

Motor Traders' Cup.

The Transvaal Automobile Club have arranged to hold the competitions for the Motor Traders' Cup, and that presented by the Club, on Ascension Day, the 16th prox.; the venue, however, has not yet been decided upon, but it is understood will constitute an outward run from Johannesburg of forty to forty-five miles and return, making a round trip of eighty to ninety miles. These contests are confined to amateurs and professional members of the Club, in the above-named order, and it is anticipated that the entries for these two popular events will be of the usual gratifying nature. Particulars, when available, will be published in these columns. The Club also announce that the tenth annual general meeting will be held on Wednesday, May Day, in Dowell Buildings, Loveday Street, Johannesburg.

Annual Report of T.A. Club.

The annual report of the T.A. Club Committee, together with the balance sheet, have been submitted to members. The Committee, *inter alia*, are pleased to be able to state that the average annual increase in the club's membership has been more than maintained during the past year, and the membership at present numbers 260. In this connection a very pleasing feature has been the growing desire on the part of ladies to become members of the club. It is hoped that the increase in the number of members will be an even greater one during the coming year, and that the efforts of all existing members will be concentrated to this end. A reference in the report is made to the several club runs and competitions held during the past season, with the names of successful competitors, and it will be noticed that the order of the contests is undergoing a change this season, for example, the date for the corresponding competitions last year to those being held next month being 26th November, but which in no way detracts from the interest taken in the events. The committee further point out the very great interest which has marked the introduction of the Motor Car Licensing Bill to the Union Parliament, and which will shortly be passed by that body, and emphasise the fact that the recommendations put forward by the T.A.C. will be embodied in the Bill practically in their entirety. Members are reminded of the work being accomplished by the club in regard to the existing road system of the country by the fact, as stated in the report, that during the past year the Committee have been in constant communication with the authorities responsible in regard to improving and maintaining roads, and in this connection the thanks of the club are due to the Public Works Department for the courteous manner in which the various suggestions have always been received. In a reference to road maps, regret is expressed for the scant progress which has been possible in this important connection. No attempt is made to minimise the need which exists for up-to-date compilations to supersede those of a misleading nature now in use. Members, however, are reminded that work of this nature cannot be attempted, with any measure of success, without involving considerable expense, and the Committee trust that an earnest effort will be made during the next year to solve this very important matter. Attention is also drawn to the fact that a large number of members have during the past twelve months taken advantage of the Club's affiliation agreement to the R.A.C. during their visit to England, and the advantages which members receive are obvious and gratifying, inasmuch as they are entitled to election as honorary members, and for the time being participate in the many benefits enjoyed by the ordinary members of the R.A.C. Last, but not least, the report dwells on the pleasant relations which have been established between the club and the authorities, and which continue to exist, and trusts that members will realise and appreciate the forbearance towards motorists generally exercised by the police in the difficult discharge of their duties.

The Price of Petrol.

Owing to the continued rise in the price of petrol, the home journals are drawing attention to the paraffin carburettor, of an efficient design. Some of the cars on show at Olympia were fitted with carburettors for paraffin spirit, and also had a petrol tank with a two-way tap, by which means the driver of the car could switch off from petrol to paraffin, with no resultant trouble in regard to the running of the machine. The idea certainly commends itself from several standpoints, as a small petrol tank and a two-tray tap obviates all starting difficulties; motoring would not only be cheapened, but simplified if paraffin could be used, and owing to the fact that no difficulty need be experienced in obtaining it, even in the remote parts of South Africa, there arises a point in favour of the adoption of the paraffin carburettor which will survive a lot of criticism where this country is concerned.

To Advertisers.

The attention of motor traders in particular is invited to a recognition of the singular position which this journal enjoys as an advertising medium. It need hardly be pointed out that its wide circulation in influential quarters has long been a desirable feature of the publication, and the fact that it finds its way straight to the buyers renders it a valuable adjunct to those desirous of extending their trade throughout the Sub-Continent. Reference has been made to the twenty-first anniversary number, in course of compilation, a work calculated to claim attention from all sections of the community, and which will mark a new era in journalistic effort in South Africa, eclipsing in volume and interest anything yet attempted in these parts, providing, incidentally, an exceptional opportunity for advertisers, in which all wisely disposed may participate. As previously pointed out, the automobile industry is so almost entirely dependent on the great mining industry, which this journal represents, that the value of the latter's aid in advertising cannot possibly be over-estimated by those who desire introduction to the many influential patrons which this journal, for over two decades, has successfully catered for.

A. GOERZ & COMPANY, LIMITED.

(Incorporated in the Transvaal.)

NOTICE IS HEREBY GIVEN that the Thirteenth Ordinary General Meeting of Shareholders in A. Goerz & Company, Limited, will be held in the Board Room, Silesia Buildings, Main Street, Johannesburg, Transvaal, on FRIDAY, the 28th JUNE, 1912, at 11 a.m., for the following purposes :—

(1) To receive and adopt the Directors' Report and Accounts for the fourteenth financial year of the Company, ended on the 31st day of December, 1911.

(2) To appoint Directors in the places of Sir Carl Meyer, Bart., and Mr. James Zutrauen, who retire in accordance with the provisions of Article 74 and, being eligible, offer themselves for re-election.

(3) To appoint Auditors in the places of Messrs. Price, Waterhouse and Company and Messrs. F. W. Diamond and English, who offer themselves for re-election, and to fix their remuneration for the past audit.

(4) To transact any business which under the Articles of Association may be transacted at an Ordinary General Meeting.

Holders of Share Warrants to Bearer are hereby informed that for the purpose of attending or voting at the Meeting, either in person or by proxy, their Share Warrants must be deposited (together with a statement in writing of the names and addresses of the holders of the Warrants) at any one of the following offices of the Company :—

JOHANNESBURG.—Silesia Buildings, 76, Main Street (not later than 15th June).

LONDON.—Pinners Hall, Austin Friars, E.C. (not later than 30th May).

PARIS.—25, Rue de Clichy (not later than 3t0h May).

For Share Warrants so deposited a Certificate will be issued entitling the holder to attend and vote in person or by proxy at the Meeting in the same way as if he were a registered member of the Company. The Share Warrants deposited in Johannesburg will be released at any time after the Meeting, and those deposited in London and Paris will be released on and after the 15th June, 1912.

The Transfer Books of the Company will be closed from the 28th June to the 12th July, both days inclusive.

By Order of the Board,
V. J. RONKETTI,
HENRY CLARK, Secretaries.

Silesia Buildings, 76, Main Street,
Johannesburg, Transvaal.
Pinners Hall, Austin Friars,
London, E.C.
26th April, 1912.

General Mining & Finance Corporation, Limited.

(Incorporated in the Transvaal.)

NOTICE is hereby given that the Twelfth Ordinary General Meeting of Shareholders of the General Mining and Finance Corporation, Ltd., will be held in the Board Room, General Mining Buildings, Johannesburg, on Friday, the 7th day of June, 1912, at 11 a.m., for the following purposes :—

1. To receive and consider the Balance Sheet and Profit and Loss account, and the Directors' and Auditors' Reports for the year ended 31st December, 1911.
2. To elect Directors in place of General Konsul Albert Blaschke and Geh. Regierungsrat S. Samuel, who retire in terms of the Articles of Association, but who are eligible, and offer themselves for are-election; and also to elect a Director in place of Dr. Arthur Salomonsohn, who has resigned his seat on the Board.
3. To appoint an Auditor or Auditors for the ensuing year, and to fix the remuneration of the retiring Auditors.
4. To transact any other business which ought to be transacted at an Ordinary General Meeting..

The Share Transfer Books of the Corporation will be closed at follows :—

(a) At the Head Office from the 3rd of June to the 21st of June, 1912, both days inclusive.

(b) At the London Office from the 6th May to the 11th of May, 1912, both days inclusive.

Holders of Share Warrants to Bearer desiring to be present or represented at the Meeting should deposit their Shares at the places and within the times following :—

Johannesburg : At the Head Office of the Corporation, General Mining Buildings, at least three days before the time appointed for the holding of the Meeting; or

London : At the London Office (Transfer Department), Winchester House, Old Broad Street, E.C.,

Berlin : At the Berlin Office, 51, Markgrafenstrasse; at the Dresdner Bank, Behrenstrasse, 38/39; at the Direction der Disconto-Gesellschaft, Behrenstrasse, 43/44; at the firm of S. Bleichroeder, Behrenstrasse, 63; at the A. Schaaffhausen'scher Bankverein, Franzosischestrasse, 53/55;

Paris : At the Paris Office, 29, Rue Taitbout; at the Bank de l'Union Parisienne, 7, Rue Chauchat;

Basle : At the Schweizerische Bankverein;

Zurich : At the Schweizerische Kreditanstalt :

at least thirty days before the date appointed for the holding of the Meeting.

By Order of the Board,
W. H. BETZ, Secretary.

General Mining Buildings (P.O. Box 1242),
Johannesburg, 25th April, 1912.

It is Waste

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THE SOUTH AFRICAN

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Notes and News.

Modder Deep Sinking Record. We are informed that the Rand sinking record of 233 feet per month, which was achieved in March last at the Government Gold Mining Areas (Modderfontein) Consolidated, has been beaten by a foot during April at the Modder Deep. The previous record of 213 feet was also held by the latter mine. No details are available at the moment, but it may be mentioned that the Government Areas shaft is of seven compartments, and that at the Modder Deep of three, and is one of twin three-compartment shafts which are being sunk within about 100 feet of each other.

* * * *

Premier Diamond Mine. The total output returns of the Premier (Transvaal) Diamond Mining Company for the six months ended April 30, 1912, are: Loads washed, 4,233,206; yield, 881,518 carats. This is equivalent to about ·208 carats per load. The yield has consistently decreased from 1·29 carats per load in 1903, and was last year ·213 carats per load. The output figures for the last three years have been:—

	Loads Washed.	Yield in Carats.	Value per load.	Cost per load.
1909 ...	7,517,793 ...	1,872,136 ...	3/1 ...	1/11
1910 ...	9,331,882 ...	2,145,833 ...	3/2 ...	2/ 0
1911 ...	8,325,272 ...	1,774,206 ...	3/5 ...	2/ 1

The working cost, it will be observed, has been increasing. Prices have increased since 1909 and averaged last year 16s. 2d. per carat.

* * * *

Moore-Butters Litigation. As we go to press, we have received the following letter from Messrs. Hudson and Frames, solicitors: "With reference to the letter by Charles Butters & Co., Ltd., appearing in your last issue, we are instructed by the Moore Filter Co. to say:—(1) That the decision of the United States District Court makes no reference whatever to any Butters patent, but only to the Cassel patents. (2) That the finding of the Court is that the stationary type of filters does not infringe the Moore patent, which is a movable type. And we are to add that the Moore Filter Co. exclusively control the Cassel patents, which are the basic patents on all the stationary types of filters."

* * * *

Albu Meetings. Full reports of the Albu meetings held on Thursday appear in another part of this issue. Reports of those held yesterday, unfortunately, must be held over till next week. The meetings of the subsidiaries of the Consolidated Mines Selection will also be found fully reported in this issue.

* * * *

Obituary. It is with sincere regret that we record the death this week of Mr. Herbert Clayton, Editor of the *Evening Chronicle*, and former Editor of this journal. Mr. Clayton came to this paper in 1902 from London, where he had been Assistant Editor of the *African Review*, and resigned his position in 1906 to start a monthly of his own devoted to mining and finance. He was subsequently associated with the founding of the *Evening Chronicle*, and Rand journalism loses in him a vigorous and independent writer and a forceful and popular personality. His death at 33 cuts short a particularly promising career, and nowhere is his passing more sincerely regretted than among his former colleagues on this paper, whose deepest sympathy goes out to his widow and young family.

* * * *

The Hendryx Agitator. The tests of this machine have lately been in the hands of the Mines Trials Committee, and it is reported that as far as they have gone they tend to confirm the favourable impression created by the preliminary trials at the Wolhuter.

The Rooiberg Mine.

The Rooiberg quarterly report for the period ended 31st March last states that the 10-stamp mill ran for 86·889 days, crushing 4,648 tons (2,000 lbs.) of ore, with an output of 182·146 tons (2,240 lbs.) of black tin. The estimated profit was £9,487 13s. 5d., excluding allowance for mine taxation. Concentrates in reserve amounted in value to £1,616. The total tonnage of accumulated, partly treated product is estimated to amount to 41,527 tons of an average assay value of 2·53 per cent. metallic tin. Development and exploration have been carried on vigorously, and the ore milled has been principally drawn from supplementary fillings off the main lode channels. The grade of ore has remained practically the same. Exploratory work has been carried on principally at the South End and Camp Workings. At the former a prospecting shaft has been sunk to a depth of 50 feet and a well-defined lode intersected which carries good values intermittently, and is now being driven upon. At the Camp Workings a shaft has been sunk on a fissure to a depth of 40 feet; in the course of sinking a body of high-grade ore was encountered which is being further explored. Surface trenching in the vicinity of the Camp Workings has revealed the existence, in places, of nodules of shed tin of a high standard of purity. The water supply from the boreholes has been ample for the requirements of the old equipment, and the water from the new dam is being conserved for the new plant. The new equipment should gradually come into working condition during May. It is proposed with the new plant to deal with 3,000 tons per month, made up of 1,600 tons of ore from the mine of an estimated grade of 4 per cent. metallic tin and 1,400 tons of partially treated sands and slimes accumulations of an estimated value of 2·54 per cent. metallic tin. It is anticipated when the new plant is in thorough working order that an extraction of about 85 per cent. should be obtained from the treatment of current ore from the mine, and that from the accumulated sands and slimes—on retreatment—an extraction of about 70 per cent., and that considerably improved profits should result. The compressor is now working and a portion of the development is being done by machine drills. Capital expenditure amounted to £20,828.

* * * *

Voorspoed.

There were 1,715,884 loads of ground hauled and washed at Voorspoed Diamond Mine during the year ended December 31st last, and in addition there were 42,464 loads of waste ground hauled, making a total of 1,758,348 loads mined and hauled. The working cost was 2s. 3·25d. per load mined, or 2s. 3·92d. per load washed. The cost per load for treatment was 8·39d.; all development expenses are included in working costs. The working profit was £21,840, and the average price has been estimated at 18s. 6·5d. per carat. Some 14·10 carats per 100 loads were recovered as against 16·62 carats for the year 1910. A better recovery is expected when the plant is arranged to meet the difficulty of hard ground which prevails to a notable extent. The mine is said to be looking as well as ever, and the chairman sees no reason why the average yield of the past five years, 16·7 carats, namely, should not be attained with a suitable plant, the providing of which is now in progress. Mr. Raffalovich, the former manager, resigned at the end of the year, and was succeeded by Mr. Adams, late of the Dutoitspan Mine.

* * * *

Business Managers on Mines.

The subject of appointing business managers on mines has received not a little consideration in the past, and numerous views have at one time or another been advanced, both in favour of and against the appointment. One important group is now, it appears, giving the matter renewed attention, and, on certain of its subsidiaries, is appointing business men to act in conjunction with the mine manager and supervise all such details of mine management and routine as are not of a purely technical nature. The official in question is thus intended to act as a complement to the manager, instead of an accountant assistant. The general supervision of matters relating to labour, expenditure and revenue, the care of the gold produced and its safe delivery to a bank, are amongst the many duties of this official. Of course, a great deal depends on the ability of the mine manager and business manager to run together in double harness. A good deal of tact, and a strong determination to co-operate in the best interests of the company concerned, are most essential.

* * * *

The Sunlight Mine.

An occasional Pilgrims Rest correspondent draws our attention to what he states are inaccuracies in an article recently appearing in this journal on the Sunlight Mine, near Pilgrims Rest. In the course of his communication, he states: "The mine is not now, nor has it been, 'at a standstill,' and there has been 'no disagreement in the management.'" We are glad to give publicity to these corrections, coming, as they do, from a wholly reliable source.

* * * *

New Transvaal Gold Farms.

The question of reducing the capital of the New Transvaal Gold Farms and the nominal value of the shares was touched on by Mr. D. Symons at the meeting of that company, held last week. Prospecting work has been carried out on certain of the company's farms, so far without satisfactory results; but as against this the Chairman set the fact that enhanced prices are obtainable to-day for land. Mr. Symons referred especially to the holdings of the company in the Maclear district. Mr. Goldring spoke in dissatisfied terms of the loss sustained by the company through the sale of certain farms. The report and accounts were adopted.

* * * *

The Phthisis Report.

"We have been informed by members of the Miners' Phthisis Commission," says the *South African Medical Record*, "that the published report of that body is so full of typograhical errors that it is most unsafe to draw deductions, especially statistical deductions, from it. Over four hundred errors have been discovered. Who is to blame for this we do not know, but it is a most unsatisfactory state of things."

* * * *

Miners' Phthisis Committee.

The trouble that arose last week in the House of Assembly regarding the composition of the Select Committee which is to consider the Miners' Phthisis Bill served to show that the original Committee was not regarded as such a one as the subject deserves. Mr. Merriman insisted on putting his nominees to the vote, or rather his proposal to add two names to those on the Committee. He felt very strongly, he stated, that Sir David Harris and Mr. Theron should be added to the Committee. Thereupon the Labour Party nominated another member, and Mr. Hewat, the Opposition Whip, and others followed suit. The original number was carried, as against the proposal to add to it, on a division which Mr. Merriman forced. Mr. Merriman immediately requested that his name be withdrawn from the Committee, but the following day agreed to serve, though still maintaining that the Committee was far from being the strong practical one the subject deserved.

* * * *

Certificated Engineers.

On Saturday evening last the members of the Association of Certificated (S.A.) Mechanical Engineers held a smoking concert at the Langham Hotel. Among the guests were Messrs. Rider, Cook, Farrar, Bulkley, W. Ingham, J. A. Vaughan and other leading consulting engineers of the Witwatersrand. Several speakers addressed the members on matters affecting the Association. The President (Mr. Alex. Wallace), the Vice-President (Mr. S. McChesney), and the Honorary Secretary (Mr. Kenneth Austin) described what had been accomplished since the inception of the Association. The last named made a serious appeal for an increase in the number of members, so as to include every certificated engineer in the Union. Mr. J. H. Rider (consulting engineer to the Central Mining and Investment Corporation, Ltd.) stated that he was very glad to have an opportunity of meeting the members, and welcomed the existence of the Association, which had for its chief object the raising of the status of the engineer. The meeting was very successful, as it enabled the mechanical engineers resident and in charge of all machinery on the mines to meet, discuss and interchange views with the chiefs of the "head office" staffs under conditions, which, from the experience gained at the meeting, were distinctly social, pleasant and useful. Mr. E. T. Denby (Past-President) called attention to the fact that out of all the lives saved after the recent disaster at sea, not one of the "Titanic's" engineers' names appeared in the lists published. "Here," said Mr. Denby, amid intense feeling, "here was an ennobling example of the correct ideal of an engineer's duty!" The result of Mr. Denby's remarks was that every person in the room arose, and, with respectful deference to the dead, paid a personal tribute to the memory of noble men, engineers of whom they were all proud, who died at their posts in the performance of their duty.

* * * *

The Institution of Mining and Metallurgy.

The leading Mining and Metallurgical Institution of the world has just celebrated its twenty-first annual general meeting. The report and president's and treasurer's statements submitted drew attention to the marked progress made by the Institution, and the great and growing influence of the body. The President said that the report and statements of accounts, which were in the hands of the members, spoke for themselves, and appeared to call for but little comment from him. He thought, however, that they had every reason to congratulate themselves upon the marked progress of the Institution in every direction, as evidenced in those documents. Their membership not only increased normally, but showed a substantial and continuous upward acceleration, whilst the finances of the Institution were in an equally satisfactory condition. They had no need to glorify unduly the work of the Institution, but it must be a matter of deep satisfaction to all of them to record its great and growing influence, not only in regard to their joint professions, but as to and upon that greater technical and investing public the world over, to whose needs they had to give practical expression, and whose interests it was always their first duty to safeguard. He thought, therefore, that they might fairly accept the fact of their continued and increasing growth, and of their constantly widening sphere of influence, as strong evidence that they were recognised as fulfilling those duties with honesty and efficiency. Mr. Arthur C. Claudet, Treasurer, in seconding the motion, said he had not much to add to what the President had stated and to the information given in the report. There were one or two points which he wished to emphasise. With regard to the accounts, he thought that those who had looked into them—if anybody had—would see that they were very satisfactory. He did not know whether he was right in making the statement, and he did not want to be too harshly criticised for it, but he did not believe there was any society of the age of the Institution of Mining and Metallurgy (they were only twenty years old) which could show a more progressive or more useful existence. He would also like to call special attention to the Post-graduate Grants Trust Fund, which, as they would observe, started some years ago with £1,025. The balance now remaining, including a grant of £40 refunded by the late Mr. F. J. M. Huddart, was not much more than half that sum, and he hoped that others would send donations to the fund, which had been the means of assisting a good many graduates to take post-graduate courses to which they attached so much importance, who, from various causes, would not otherwise have been able to do so.

TOPICS OF THE WEEK.

THE OUTLOOK FOR BRAKPAN AND SPRINGS MINES.

Most satisfactory reports were presented at the annual meetings this week of the companies in which the Consolidated Mines Selection Company holds a controlling interest. Full accounts of the proceedings will be found elsewhere in this issue, and it will be seen that Mr. J. G. Hamilton was able in every case to make a favourable pronouncement. The prosperity of the group is, of course, rooted in the excellent initial returns from Brakpan and the good prospects of Springs Mines. The labour supply is now ample, Brakpan profits are being fully maintained, a dividend of 15 per cent. at June and, possibly, more in December is anticipated, and the company is now out of debt. At Springs, the rate of shaft sinking, despite water and other troubles, is so good that the reef is expected to be struck before the end of the year in the north shaft, and the latest results from the Geduld augur well for reef prospects. In several particulars Mr. Hamilton's speeches will be found to amplify and bring down to date the returns recently printed from Brakpan and Springs. In the case of the former, Mr. Hamilton was able to announce that the company was now entirely out of debt, having repaid the loan contracted to cover the additional capital expenditure incurred over and above the working capital supplied and the interest earned, of which full particulars are given in the directors' report. The tonnage treated this month will be fully 48,000 tons, and he ventured to anticipate that the profit, exclusive of the reserve gold, would be in the neighbourhood of £30,000, and that, with a continuation of the present conditions, they should be enabled to at least maintain that figure in future months. "I quite realise that to prophesy 'before one knows' is a risky and often thankless task," he added, "but I feel that the circumstances justify me in being confident of the declaration of a dividend at the end of June, and in saying that the dividend is more likely than not to be one of 15 per cent. I qualify this forecast, as it must necessarily be qualified in the circumstances, by stating that its fulfilment is evidently dependent on the profits to be obtained this month and for May and June; but there is absolutely no reason that your directors know of to anticipate any decrease in the results now being secured. I may go even further and say that I think we may pretty confidently look forward to a somewhat increased distribution at the end of the year; but you must realise that I say this with all due reserve as to possible contingencies. These things in the event are, as always, 'on the lap of the gods.'" This is as definite and as reassuring as any chairman could make it or as any shareholder could expect. Of the Springs Mine, Mr. Hamilton was also able to speak most hopefully. The actual depths of the shafts on Monday were 2,211 feet in the north shaft and 1,742 feet in the south shaft. Mr. Hamilton pointed out that the indications as to the value of the reef when opened up were confined, in the first instance, to the assay values obtained from the borehole cores, and in the second instance to the developments which were taking place upon the Geduld Proprietary Mines, upon the dip of which the Springs Mines ground lies. The values obtained from the borehole cores, as given in the directors' report for the year 1909, were as follow: Borehole No. 1, 28·42 dwts. over a width of 18·56 inches; borehole No. 2, 21·42 dwts. over a width of 10·81 inches. Developments at depth on Geduld are most encouraging. On No. 2 level, being driven at a vertical depth from surface of 1,825 feet, and situated 3,240 feet east of the No. 2 vertical shaft, 1,330 feet of development have been sampled out of 1,402 feet driven, and have given the satisfactory average of 9·12 dwts. over a milling width of 40 inches. "It is somewhat difficult to give reliable figures to-day," said Mr. Hamilton, "as to what the actual financial position of the company will be when the shafts are down to the reef. At the same time, you will naturally desire to get some general idea on the subject, and I can tell you it is estimated that, barring any unforeseen adverse occurrences, we should have some £50,000 left with which to start the development of the mine after the sinking costs of both shafts shall have been defrayed. The option on the second block of 165,000 shares, at the price of 40s. per share, falls due on the last day of the present year; but I have some natural diffidence—at any rate, in the present condition of the market, in anticipating that this option may be exercised." From the accounts of the meetings it will be seen that Mr. Charles Marx, Mr. Clem Davies and Mr. M. G. Elkan fully shared the cheerful views of Mr. Hamilton, and that the companies of the Consolidated Mines Selection group are in a flourishing position. Indeed to the excellent showing by these far East Rand companies is no doubt largely due the accession of confidence in the South African sharemarket that ushered in the week.

THE NATIVE LABOUR POSITION.

From the annual report of the Witwatersrand Native Labour Association, the speech made by the Chairman of that body last week, and the speeches made at various company meetings held this week, a good idea can be formed of the present native labour position. At the W.N.L.A. meeting, the Chairman, Mr. H. O'K. Webber, dealt mainly with the fluctuations in the supply during last year, the health question, and the elimination of recruiting competition. Owing to the abnormally dry weather during the last three months of 1911, the usual increase which in former years commenced in November, did not make itself felt until the month of January of this year. Since then Mr. Webber was able to announce that there had been a steady increase, so that at the end of this month the number of natives in the employ of members would approximate 220,000, as compared with 213,111 at the end of April last. "It looks," Mr. Webber added, "as if there will not be much increased demand during this year." The chief sphere of operations of the Association continues to be in Portuguese territory, whence the number of natives recruited in the districts south of latitude 22 degrees during the year 1911 was 40,894, as compared with 44,684 for the year 1910. From districts north of latitude 22 degrees we received during the recruiting season beginning August, 1910, to March, 1911, 19,650 natives, and this compares with 15,640 natives for the period beginning August, 1911, and ending March of this year. This decrease is due, firstly, to certain restrictions having been placed on recruiting in certain areas, and, secondly, to greater care being taken in the examination of natives at the ports of embarkation and at Ressano Garcia, with a view to eliminating those suspected of physical unfitness. During the year 1911, the number of natives coming from the Cape Colony to the mines was 59,814, compared with 62,719 for 1910; from Natal there were 16,303 as compared with 13,173 for 1910; from Basutoland 13,722 as compared with 12,319 for 1910; from the Transvaal 18,042 as compared with 19,630 for 1910, and from other parts of South Africa 6,127 as compared with 5,976 for 1910. In order that the tendency of the natives to come in of their own free will may be encouraged among the natives of the Cape Colony, and in order that they may be given every facility to emigrate from the Transkeian territories for work in the Transvaal, the Association has lately inaugurated a system of establishing forwarding stations at convenient places in the Transkei and Pondoland, where natives wishing to work on any particular mine can accept the terms offered by that mine and engage themselves on the spot before proceeding to the Transvaal. "It is hoped that by this means," said Mr. Webber, "the natives of the Transkeian territories will gradually learn to find their own way from their homes direct to the mines on which they wish to work. They will be given every facility for coming up to the Rand, though those in charge of these volunteer attesting stations will not in any way engage in what is known as recruiting the natives for work. As time goes on, it is hoped to extend this system to all the territories within the Union and thereby do away with expensive organisations for recruiting natives and the paying out of advances to them before they leave their homes." We understand that plans to this end are even further advanced than Mr. Webber indicated, and that the costly recruiting competition so often of late deplored by Rand chairmen may soon come to an end. It is unnecessary to dwell on Mr. Webber's extended and sympathetic reference to the improvement in conditions under which the natives work and live on the mines. Everything humanly possible is being done to improve their lot, and this, coupled with the fact that the supply is improving daily, and that the "insensate recruiting competition" promises soon to end, makes the native labour outlook for the mines at the moment exceedingly satisfactory.

PROGRESS OF THE RIVER DIGGINGS.

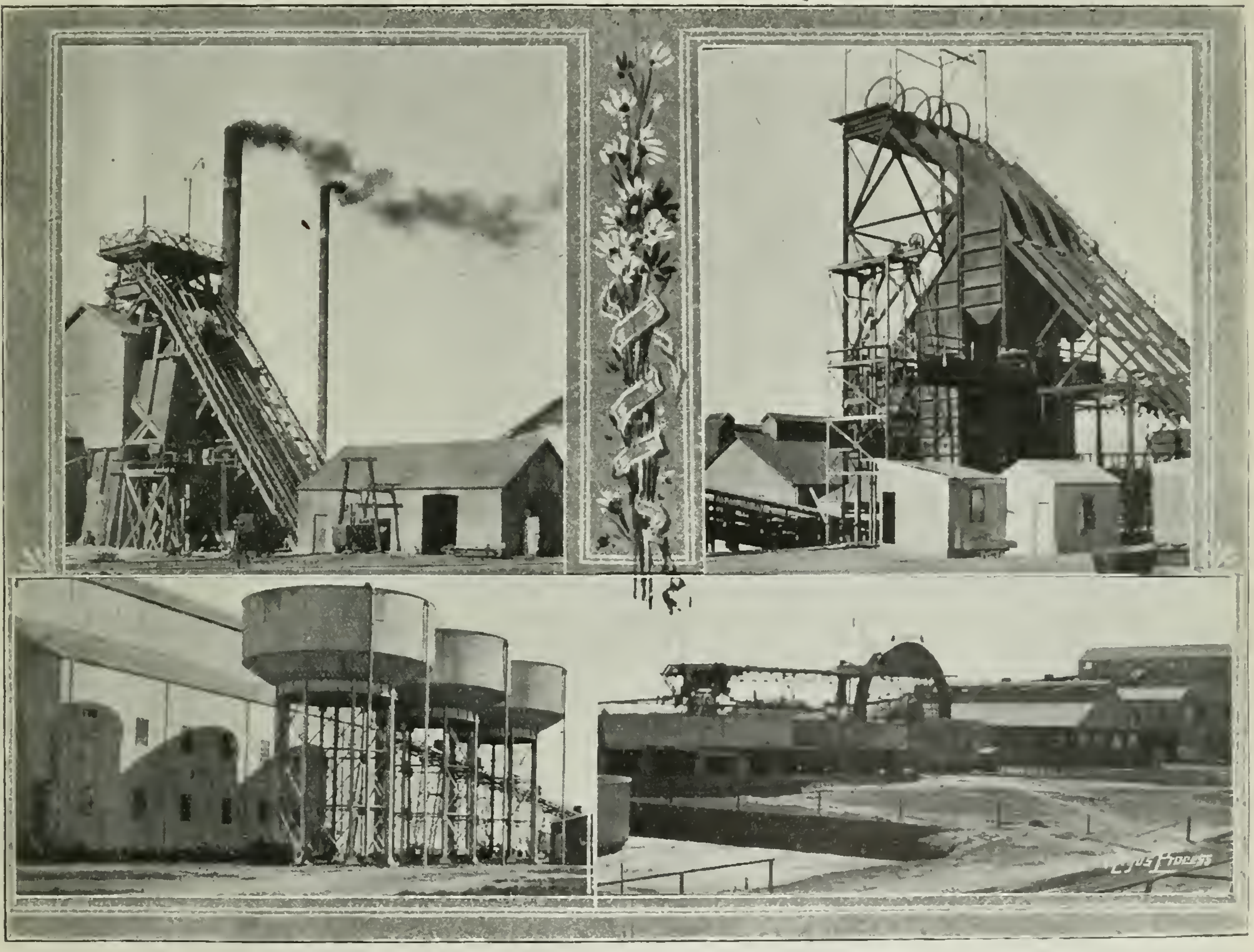
Although, as we have pointed out more than once in these columns of late, the returns from the more highly "boomed" farms on the River Diggings continue to be disappointing, the alluvial fields of the South-Western Transvaal are returning a steadily increasing output. According to the latest official figures, the output for last month totalled a value of £36,702, for February £32,817, and for January £32,012, a total for the three months of £101,531; while the yield for the whole of 1911 amounted to the value of £198,825, so that the output this year is at the rate of more than double that of the previous year. Although Mooifontein's output has diminished by £4,342 to £12,525, Bloemhof has increased its yield by £6,921 from £6,123 to £13,044. The *Klerksdorp Record* points out that during this period a rush of diggers from Mooifontein to Bloemhof occurred, and, although the rush was caused by the reports of good finds, it is obvious that the increased yield is greatly attributable to the increase in the number of diggers. The next contributor in order of value is the farm Weltevreden, adjoining Mooifontein. This digging shows a slight increase in its March output over that of February, the amounts being £3,430 and £3,365 respectively. London, which was fourth on the list in February with £1,556, retains the same position, but has increased its output to £2,081. Avondster's return for February was valued at £1,756 15s., and it comes fifth in March with £1,608, and Panfontein, another new contributor, adds £1,256 to the total. Goedgenoeg, although it occupies a lower place in the list than it did in February, has advanced its yield by over £100. The falling-off in Modderkraal's output from £1,237 in February to £479 in March is a feature of the returns. Most of the other contributors are only in the initial stages, and, although they do not add much to the total, they are indicative of the large area over which the diamonds are distributed, no less than nineteen farms being on the list of contributors. The Government, in their returns for the month of December, gave the number of diggers on the whole fields as 4,000, but this was no doubt based upon the number of licences issued. A return of licence revenue for the month of March gives a proportionate idea of the population. It is as follows: Bloemhof, £375 5s.; Mooifontein, £181 10s.; Weltevreden, £159 10s.; London, £97 5s.; Goedgenoeg, £52 10s.; and Modderkraal, £44. The fact that these returns are spread over such a large area goes to show the extent of the alluvial deposits, though, of course, the success or failure of individual diggers remains problematical. Chance and luck are still the chief factors in the search, and until further results are available we can only echo the hopes of those chiefly interested, without, however, necessarily sharing their confidence in the future of the diggings.

Mines of the Witwatersrand.

XVI.—ROODEPOORT UNITED MAIN REEF G.M. CO., LTD.

A Difficult Proposition—Underground Developments—The New Plant and the General Outlook.

The working profit earned by the Roodepoort United Main Reef Company last year was £81,897, or an increase of £52,289 over the figure for the preceding year. For the first quarter of the current year the working profit has been declared at £12,171, or an average of £4,000 per month. These latter results are below what was expected the company would secure when the Kimberley Roodepoort property was absorbed, the two old mills disbanded, and the new reduction equipment plant was erected. It is explained in the last quarterly report that the "decrease in the working profit, as compared with the previous quarter of £11,231, is attributable chiefly to the temporary falling off in grade of several of the stopes which were contributing ore to the mill." The fall in profits during the current year may, in fact, be regarded as a temporary phase, and one which will disappear after the necessary connections between the Kimberley east section have been effected and the opening up of the new levels from the Kimberley main shaft have been completed.



Old United Shaft.
New Mill and Water Storage Tanks.

Kimberley Main Shaft.
General View, Mill and Recovery Works.

Development and Ore Reserves.

At the meeting on Thursday, Sir George Albu said, *inter alia*:—"It will be observed that the payable ore fully developed at December 31 last, although giving a slightly higher value over a larger stoping width, shows a decrease of 168,935 tons as compared with the payable ore reserves at the end of the previous year; in other words, that we only developed some 270,000 tons of payable ore during the year, as against 440,000 tons mined. This would at first sight appear to be a somewhat serious feature, and I am glad, therefore, of the present opportunity of assuring you that it does not merit the importance that some shareholders may have been inclined to attach to it. It was pointed out by the chairman at the annual meeting of your company two years ago that the South Reef (the more consistent body as regards gold contents in the Roodepoort district) had then been almost entirely worked out in the old United section, and that as regards this reef the newly-acquired Kimberley-Roodepoort section must for the future be viewed as the main source of supply. It is clearly explained in the manager's report for the past year that the proper development of the South Reef in the Kimberley section could only be effected to a limited extent until the sinking of the main incline shaft in this portion of the property had been carried to a sufficient depth to allow of additional levels being opened up. I have already pointed out that considerable progress in this respect was made during the past year, and I may supplement this statement by informing you that the work has not been allowed to fall into arrear during the last four months."

The Roodepoort United section has now been developed down to the 12th level—the southern boundary. In the Kimberley section fourteen levels have been opened up, and a large extent of southern ground remains to be exploited. The future development of this portion of the mine is thus of much importance to the company. At the present time 60 per cent. of the ore drawn is hoisted through the Kimberley main and Kimberley east shafts, and the remainder from what is termed the United shaft, the only one on the original property now being worked. In the future a still larger proportion will be drawn from the Kimberley sections. The development operations carried out last year totalled just under 15,000 feet, and the ore reserves at 31st December, 1911, stood as under:—

Payable ore fully developed—

South Reef .	231,300 tons at 6·36 dwts. over 36 inches.
Main Reef ..	217,500 tons at 4·56 dwts. over 48 inches.
	448,800 tons at 5·49 dwts. over 42 inches.

Unpayable ore fully developed—

South Reef .	27,000 tons at 2·71 dwts. over 36 inches.
Main Reef ..	506,900 tons at 2·89 dwts. over 48 inches.
	533,900 tons at 2·88 dwts. over 47 inches.

It is to be observed that the percentage of unpayable South Reef to total ore developed is far less than for Main Reef, and the future profits of the mine, it seems, will be derived in the main from this ore body in the large blocks of virgin ground in the Kimberley section. A sound development policy is being pursued, and a substantial increase in ore reserves may be expected at an early date.

THE NEW EQUIPMENT.

It was estimated some little time ago that with the full mill at work costs would be reduced to about 15s. per ton. This anticipation has not as yet been realised, the working expenses for last year averaging 18s. 7d. per ton, and for the quarter ended March 31, 1912, 18s. 3d. The full capacity of the mill is, however, 60,000 tons per month, whereas the tonnage milled per month at the present time is under 30,000. During the last quarter only 50 stamps out of 100 erected were at work, and three of the five tube mills were employed. The ore stamped was 85,623 tons. The cyanide plant of the company will have to be added to somewhat before the full crushing capacity is attained, as more treatment tanks are necessary. The new mill and cyanide plant lies to the south of the Kimberley main shaft, and is situated at a considerable distance from each of the three shafts which are contributing ore. The stamps are of 2,000 lbs. falling weight, and the duty is the highest recorded on the Witwatersrand, 19·799 tons per day being returned for the past quarter. The plant is well designed, and the type of machinery is modern throughout. It is of interest to note that in contradistinction to the City Deep the amalgamating plates are of shaking type and not stationary, as at the great Central Mining Corporation deep level.

FINANCES AND GENERAL OUTLOOK.

The labour complement of the company to-day is 3,000, which should be ample for present requirements. The present returns are scarcely satisfactory, but the outlook for improved results is good. Operating on the full stamping basis and crushing about three-quarters of a million tons per annum, a substantial decline in working expenditure will be recorded. At the same time it must be realised that the mine is a difficult one to operate on account of its straggling nature and the cutting out of a number of claims almost in the centre of the mine by faulted ground. The financial position of the company at the end of last year was briefly that liquid assets exceeded current liabilities by £1,136. On the other hand there was a liability of £193,935 to the General Mining and Finance Corporation, which it is proposed to capitalise on the advent of "more favourable financial conditions." The reef-bearing claims of the company number 458·71, and in addition there are held water-rights, bewaarplaatsen, etc., equivalent to a further 78·93 claims. Obviously a very large tonnage of ground remains; but until development has been carried down below the 14th level in the Kimberley section—at present the deepest level in the property—it is difficult to form anything approaching a reliable estimate as to the mill tonnage available. The question of absorbing further areas to the east of the present property has been considered on two or three occasions. As yet nothing has materialised in this regard, but it may well be that a further extension of the Roodepoort United Company's claim area will yet be an important event in the history of this company.

SAND FILLING PROGRESS.

Extension of the Process at the Simmer and Jack—The Importance of Slime Free Sand—Satisfactory Conditions at the City and Suburban.

A SECOND borehole, to be used for the purpose of sending sand down into the Simmer and Jack mine, was started on Wednesday last. The diameter of the bore will doubtless be of the usual size, that is to say in the neighbourhood of seven inches, as at the Robinson Deep, for example. Preparations are being made at other points upon the property, also, where subordinate shafts are available, with the object of eventually lowering all the sand produced into the workings. The usual means of obtaining clean sand will be used, of course, for as is well known the difference between thoroughly slime free sand and that which carries an appreciable portion of slime is pretty considerable when facilities for draining the mass are taken into the calculation. The slime, when the material is sluiced into the old stopes, has a natural tendency to flow to the extreme edge of the area which is being filled, usually, that is to say, the barrier against which the water gravitates in the process of draining. This creates an obstruction to the free flow which may give way to great inconvenience and renders the control of operations underground somewhat difficult. The washing of the sand is effected in diaphragm cones, with dimensions of about 8ft. by 10ft., to which the sand gravitates along a launder in a stream of water from the treatment vats, or is lifted by means of a centrifugal pump. In those cases where a Caldecott sand filter table is in use a great deal, if not all, of the washing required will probably have been already effected. The Simmer and Jack, we believe, will have the distinction of being the first mine where the whole sand produced in current cyaniding operations will be transported back at once into the mine, thus keeping up a continuous cycle of handling, in which the ore, minus the slime created, will be continuously and automatically dealt with from the time it leaves the stopes in one portion of the mine until it is sent back, exhausted of its payable gold contents, to the worked-out stopes in another part of it.

INCREASED SLIME PRODUCT AT ROBINSON DEEP.

At the Robinson Deep sand filling has not yet commenced at the borehole which was put down some little time ago, and the tunnel which is to connect the sand vats with that point is still in course of making. A classification system to yield clean sand, referred to in a recent article on the property, will be in use by the time filling begins, and the slime product will by this means be increased from 40 to 50 per cent. of the mill pulp, thus permitting a suitable material to be sent to the stopes.

At the City and Suburban, it is said, the introduction of the cones in connection with the sand filter plant has enabled a particularly clean residue to be supplied for stope filling purposes, and the advantage of this condition of things has doubtless been recognised underground.

DEVELOPMENTS ON THE MURCHISON RANGE.

Extended Pegging—A Promising Quartz Reef Field in the Transvaal.

[FROM A CORRESPONDENT.]

A Pocket from which the Mill recovered well on the Bellevue.

Typical of the Murchison Range. "Castle Kopjes" (five in a row), with a frontage of five miles, end to end, to the Main Road.

A Cutting on the Bellevue Mine.

THE Leydsdorp district can show another forty miles of gold-bearing reef undeveloped within our own borders. The figure may seem absurd, but one need only visit the Murchison Range to see that it is so, for the outcrops are traceable right along the mountains, from Leydsdorp to the old Welnecia, and then reappear periodically further on, right out to Witkop. It is simply incredible that the Range should have been shelved all these years—impossible, in fact, in almost any country except South Africa; but now at last the railway is through, and we can reach the district in reasonable comfort and within reasonable time, Messrs. Pauling and Co. have completed the Selati Railway Extension as far as Gravelotte. Johannesburg seems to have little idea of what has been going on on the Murchison Range within the last year or two. One can see pegs everywhere. No ground that is at present worth pegging has been left unpegged. Sometimes the pegs appear on the hill, as in the case of the Gravelotte and Free State mines, which appear like crow's nests perched 300 feet or so above the surrounding country, but ordinarily you see them in the bush, by the side of the road, as you ride or motor along. Everything on the range is full of interest just now. Possibly it is a repetition of Rand history. The mines are beginning to shake and stretch themselves, and some of the pioneering enterprises are already getting their stride. The United Jack, for instance, is reported to be getting 8 dwts. over 20 feet, and it is said they have large plant at present on order, and will shortly be setting it up. Weigel's Consolidated, too, is exhibiting considerable activity, as are the Griffin Mine and several others. Our geological authorities are of opinion that this will eventually prove to be the only permanent quartz-reefing field in South Africa, the reefs having been well tested to a depth of 300 feet. In one case at least (Murchison Free State Mine), it is reported they are still holding at 600 feet, values being well maintained at that depth. The average dip is in the neighbourhood of 60 to 70 degrees, and widths, which are very variable, go from about three to forty feet. The richness of the outcrops in parts is phenomenal. Of course, the fever during the summer months has been a great bogey in the past, but the example of the S.A.R. Administration in using wire gauze doors and blinds, and mosquito curtains, in the Low Country, is being very generally followed, and the "skeeter" is outwitted, and fever is a bogey no longer. It seems that the Murchison Range has a magnificent future before it, and that if the capitalisation of it is run on reasonable lines, developing, say, from five to ten stamp propositions into bigger concerns, the district should prove more profitable than any other quartz-reefing field in the country.

I am creditably informed that the Bellevue Mine is, being taken up at the present time on this basis, and that a private company, now in course of formation in town, has secured the running rights over their 113 claims, with the option of purchase on exceptional terms. The company will have a nominal capital of £5,000, and a working capital of £2,000; reserve £1,250. The property has already maintained an average of 12 dwts. over the plates alone, notwithstanding the presence of antimony, during its total working period, and has already produced fully £6,000 of gold. This amount has, in addition, been recovered solely from the only two claims which have been worked in the past, and their claims are approximately 22 along the strike and five deep. Their deepest workings are only 73 feet down, and the longest drive (200 feet) is still in reef, with no sign of it pinching anywhere.

Report says that the Grampian Mine is also likely to be worked very shortly, and that they have been increasing their holding of claims. Altogether the district is really worthy of a great deal more attention than has yet been accorded it, and a great deal more should be heard of the Range within the next few months.

LATEST FROM THE PILGRIMS REST GOLDFIELDS.

[FROM OUR CORRESPONDENT.]

Rumour had it that one well-known mine at Sabie was closing down milling to develop the mine, the latter move being contingent on their raising a certain sum of money. No definite news can be obtained. It is stated by some that five stamps will be kept running for twelve hours per day to pay the cost of development. In other circles any move from the ordinary routine is denied.

* * * *

The G.H.L. Syndicate on Spitzkop is doing well, but it is early, in absence of definite data, to say how things will go.

* * * *

Mr. Geo. C. Damant, Manager of Glynn's Lydenburg, is about again after his operation.

* * * *

Mr. Maxwell, Assistant Mines Inspector, was in Sabie in connection with flooding of the Ceylon Lydenburg, Buchanan's and the Jollie Bright.

The opening of Waterval No. 48 on May 13th is attracting some attention, but apart from some rich leaders which may pay individual workers, I fancy there is little of value. Some of the leaders, however, are very rich, so one cannot predict what future there is for this ground.

* * * *

The Townships Board was here on Thursday to approve of the sites at Graskop and Sabie. The former, I think, will be passed, and it is the intention of the Government to proclaim it in the near future and make a central township at rail head for the whole district. For this reason I predict that Sabie will not be proclaimed, as it is felt that there is no need for two townships so near together.

* * * *

I made a slip last week as to the Peach Tree Syndicate. It should have read the Beta Syndicate. The former also hold some valuable ground there, though not so near to the Peach Tree mine of the T.G.M.E.

South African Tin Mines.

RECENT ENCOURAGING RESULTS.

In a circular to shareholders, the secretary writes:—The reports and accounts for the year ended December 31, 1911, are being prepared, and at the meeting to be called to consider them, you would be informed of the prospects of the company. During the past few weeks, however, the position at the mine has improved so considerably, that your board deemed it advisable to report to you now. You will remember that for the first six months of last year the shortage of native labour affected operations considerably; during the last six months this trouble became so acute, that practically all development was arrested, and it was not possible to obtain sufficient rock to meet the requirements of the mill; indeed, for a while the directors were faced with the problem as to whether or not the mine should be kept going. In February of this year the native labour force began to increase; by the middle of March the complement was sufficient to enable the manager to run the mill to its full capacity, and to extend operations underground in development and prospecting. This work is described by the consulting engineer, whose report is given below. The directors are satisfied that the discoveries have largely increased the ore reserves, and placed the company in a totally different position. You will be gratified to learn that in consequence of these discoveries the revenue from sales of tin has, since the 1st of March, been well in excess of all expenditure. The consulting engineer reports: "The following is a short summary of the new things which have been met with in the mine during the past eight weeks: A rise was started on No. 5 level for the purpose of communicating with a winze which was going down from the bottom of an underhand stope below No. 4. They failed to meet, because they were on different planes. They proved to be in separate and distinct ore bodies, the hitherto unobserved occurrence being that followed from No. 5 level. Instead of one reef there are two. The intervening ground, a few feet in thickness, is all of it mineralised, though it may be that some will need to be sorted out as too poor for the mill. Again, it has been found that in the stope, in which the lower of these two bodies had been mined, there is an underlying stratum of ore of good value, which, although it may prove to be merely a local occurrence, can only be termed a third reef. The finding of the second ore body between levels 4 and 5 naturally prompted search elsewhere. As yet it is early days to speak of complete duplication, yet something of the same kind has been found both on the 3rd and on the 2nd levels. And it is worthy of note that so far as can yet be judged, the new ore body exposes higher tin values than did the old one. The several discoveries are of extreme interest and of no small importance. Under the old conditions, in the zones of reef rich enough for milling, stoping had to be confined to a width of from three to four feet. To-day, a stope over No. 4 level is being carried from ten to twelve feet wide; and the indications are that between Nos. 4 and 5 still a greater width of strata is mineralised." Reports and accounts for the year 1911 will be in your hands about the middle of May; a report covering operations to the end of April will accompany them. The annual general meeting of shareholders will be called for about the end of May.

RAND CAPITAL EXPENDITURES.

A Study in Millions—Mines Comparable with Dreadnoughts—Eight Mines Record a Total of Thirteen and Three-quarter Millions.

It has been truly said that a modern Rand mine in point of expenditure is comparable with a Dreadnought. Few adequately realise the vast sums of money necessary to bring a Witwatersrand mining proposition, and especially one with deep shafts, to the stage of production. Some facts and figures, culled from a few balance sheets recently issued should, therefore, prove of considerable interest.

Uniformity in Accounts.

Amongst the terms of reference and enquiry which recently received the consideration of the Standardization Committee of the Institution of Mining and Metallurgy, the balance sheets of mining companies came up for study and recommendation. The Committee, whilst making some pertinent recommendations and defining the proper usages and functions of accounts, such as are included under development redemption and suspense headings, were unable to complete any very thorough classification or unification because of the different circumstances attending the affairs of different mines, the varying methods employed and the different interpretations placed upon different terms and accounts. A little examination of the balance sheets of different Rand groups suffices to indicate the marked lack of uniformity existing in regard to the statement and segregation of mine accounts. In this particular instance we are concerned more especially with capital expenditure, and in this regard a very marked divergence as between the various controlling houses of the Witwatersrand is to be observed. Thus we find one group segregating expenditure according to the amount spent on (a) mine development, (b) shaft sinking, and (c) equipment. Another house employs the term "permanent works," which presumably covers shafts. Another group uses the more nebulous words "fixed assets," a term which no doubt covers shafts, shaft equipments and general machinery and plant. Some companies discriminate between shaft equipment and reduction and treatment plants. Others do not adopt this method of allocating expenditure. It will thus be readily appreciated that to contrast the amounts expended on capital account—on shafts, development and equipment—by different Rand gold mines is no easy task. Strictly speaking, all expenditure incurred previous to the commencement of production should come under this head of capital expenditure, but the methods of accounting and segregation are so involved and varying that exact comparisons between the costs of equipment or costs of development or of shaft sinking at different mines cannot in the majority of instances be arrived at from balance sheets alone. We have deemed these remarks necessary before proceeding to discuss the sums expended by a few of the most modernly-equipped mines of the Main Reef series. Notwithstanding the impracticability of giving exact comparisons, some interesting statistics may be advanced as to the cost of sinking shafts in and developing and equipping some of the newer and most modern mines.

A Necessary Consideration.

The amounts expended depend, of course, very largely on the extent of the property, the depth at which reef lies and the size of milling and treatment plants. In considering the statistics appended, it should be borne in mind that the majority of Witwatersrand mines were originally laid out with a view to expansion of operations and therefore of plant. Many concerns, especially the older mines, have attained to the zenith of their production, but nearly all the newer installations have been designed on bases which will admit of extension. One cannot, therefore, obtain a fair and equitable capital expenditure per stamp factor of comparison for the mines here dealt with. The Cinderella Consolidated, for example, has erected one hundred stamps and three tube mills, whilst the capital expenditure incurred to date has amounted in round figures to a million and three-quarters. The intention is to increase the capacity of the plant to 1,200,000 tons per annum and to 2,500,000 tons per annum at a later date, and on these larger expenditures the amount expended per stamp or per claim will be substantially less than on the present basis. Similarly the City Deep mine has been laid out with a view to extension, and so have Modder B., the Village Deep, and in fact the majority of the concerns dealt with hereunder. After this necessary preface we will proceed to deal with the capital expenditures incurred by a few mines which have recently completed new plants.

Expenditure Analysed.

The Randfontein Central, possessed as it is of the largest milling installation on the fields, had spend up to the end of last year over two millions sterling on shafts and development, and close on two and three-quarter millions in respect of machinery and plant. General equipment at the City Deep has cost double what has been expended on mine development and shaft and mine equipment, the figure for the item of expenditure included in the former being £827,923, and for the latter £415,738. These proportions are more or less maintained in the capital expenditure of the Modder B, where up to the end of last year development had called for £295,932 and equipment £495,463. On the other hand, the Village Deep Company has spent substantially more on shafts, shaft equipments and development (£675,237) than on equipment (£617,217). Of the three shafts of this company, the Turf Mines vertical—the deepest shaft on the Central Rand—has, of course, claimed by far and away the largest amount. The Bantjes has paid out over £400,000 for equipment, and spent a quarter of a million on development. Brakpan Mines expenditure figures at £935,316 in respect of shaft sinking and equipment—£16,790 "compressors" and £194,383 on development. The total expenditure of the Simmer Deep, where a number of deep shafts were sunk, on companies now included in the amalgamation scheme, amounts to over £2,100,000. Shaft sinking at cost stands at £584,298, and unredeemed development £459,876, making a total of expenditure "below ground" of £1,044,174. The charges in respect of equipment of property, less amounts written off, total £1,078,174.

An Impressive Total.

In the following table are stated the totals of capital expenditure incurred by these mines up to the end of last year. The aggregate sum for the eight mines concerned amounts to no less than £13,760,211, or an average of £1,720,026 per mine:—

Randfontein Central	£4,789,023
City Deep	1,243,661
Village Deep	1,292,454
Modder B.	791,395
Bantjes Consolidated	658,514
Cinderella Consolidated	1,716,327
Brakpan Mines	1,146,489
Simmer Deep	2,122,348
	£13,760,211

Voorspoed Diamonds.

At the Voorspoed Diamond Mine three grease tables of the Frue vanner type were installed last week, and are working very satisfactorily. This addition to the plant will mean a great economy of labour in the pulsator department. It has also been decided to erect a new roller plant, to supersede the present crushers, and when the improvements and additions are completed the directorate and management hope to have the mine established on a sound financial basis.

A NEW DIAMOND FLOTATION.

Proposed Exploitation of Derdepoort, Pretoria District—Prospectus of the Vilma Company Issued.

Of late, despite the high price obtaining for diamonds, new diamond flotations have been remarkably few. Activity has rather been confined to individual and small private syndicate enterprise in the Bloemhof district, and the formation of new concerns with fairly large capitals to exploit diamondiferous prospects seemingly has received little support or encouragement. With the exception of the National Diamond Syndicate, no new companies or syndicates to exploit gem-bearing ground in the Pretoria district have been formed for a long while past. Accordingly a considerable measure of interest attaches itself to the Vilma Diamond Mining Company, especially so in view of the amount of capital involved, £80,000 in £1 shares, which, it may be recalled, was originally the capital of the Premier. The Vilma Diamond Company appears to be a Pretoria and Benoni venture, offices and secretaries having been established at each town, whilst the directors are Messrs. Johan B. Wolmarans and H. F. Cooper (described as "prospector" of the Pretoria district), and Dr. R. A. Ross and Mr. H. P. van Eyck, of Benoni.

The allocation of capital is as under: Working capital, £15,000; reserve shares, £13,800; to vendor and discoverers in cash, £5,000; to vendor and discoverers in shares, £40,000; to promoters and underwriters in cash, £200; to promoters and underwriters in shares, £6,000; total, £80,000. Twenty thousand shares are now offered for public subscription, of which 5s. per share is payable on application and 2s. 6d. per share on allotment, and the balance in instalments which will be called up by the directors at not less than one month's written notice. In case of the capital being over-subscribed, the allotment of shares shall be made *pro rata* according to the number of shares subscribed. The company has for its main object the purchase of certain portions of the farm Derdepoort No. 469, district Pretoria, to wit: Portion No. 1, measuring 96 morgen (upon which blue and yellow ground has been discovered); portion No. 2, measuring 4 morgen 29 square roods (known as Reserve "A"), adjoining No. 1; portion No. 3, measuring 25 morgen 444 square roods (known as Reserve "C"), upon which a spring is situate. The total extent being 125 morgen and 473 square rods, as surveyed by Surveyor J. H. Fehrsen, the property of Mr. J. B. Wolmarans, and to develop the said property and to mine thereon. The property has been inspected by Mr. F. M. Krause. In the course of his report Mr. Krause states:—"The prevalent rocks of the district are quartzites and shales belonging to the Pretoria series; they have a persistent east and west strike, a northerly dip averaging 23 degrees, and with their attendant diabase sheets are as a rule well exposed in natural sections. At a distance of about three-quarters of a mile to the north of the southern boundary of Derdepoort, and midway between Hartebeest-spruit and Koedoes spruit, the stratified rocks are traversed by an intrusive body of peridotite, the trend and shape of which—whether dyke or pipe—are as yet imperfectly known. Its position superficially has been to some extent defined by a number of shallow pits that have been sunk upon it, but it must be understood that the boundaries as shown on the plan are merely provisional. The area superficially occupied by peridotite is bound on the south by a diabase dyke; on the east by a fault plane; on the north by a boss of felsite; while on the west it is obscured by local drift. This gives apparently a meridional extent of 1,200 yards and a lateral extent of 350 yards. A prominent feature of our peridotite, and one which distinguishes it readily from the kimberlites of other localities in the Pretoria district, is the profusion of large-plated magnesian mica it contains. In the southern part of the area the mica is chiefly brown transparent biotite, while in the northern part it is represented by white, translucent to opaque phlogopite. In its weathered condition ("yellow ground"), the peridotite has a greenish to greyish yellow colour, is earthy or friable near the outcrop, but becomes harder in depth. Of its component minerals none but mica and ilmenite are macroscopically recognisable. One diamond (at present in my custody), weighing about half a carat and several smaller stones were, I believe, found in the yellow ground taken from No. 4 pit. Among foreign enclosures in the yellow ground are fragments, from 2 to 9 inches gauge, more or less rounded, of hard peridotite diabase, quartzite, schist and granite. At a depth of from 30 to 35 feet below the surface the yellow ground changes to a dark grey, moderately hard rock ("blue ground"), which has the character of a completely serpentinized olivine rock, rendered porphyritic by numerous, mostly large phenocrysts of biotite. Ilmenite (in part magnetite) is usually present, though not plentiful; garnet occurs in minute grains, hardly discernible with the naked eye. White and purple calcite, very abundant in places, is probably secondary, and in view of the scantiness of lime in the normal type of rock is no doubt derived from an extraneous source. Fresh olivine is absent from the specimens I have examined, but is, I am informed, commonly found in the concentrates of washings. The felsite rock which seems to cut off the kimberlite at the Magalies Range—is everywhere in too weathered a condition to allow of its mineral composition being readily determined. In the bed of the Koedoes spruit the rock is completely reduced to a white calcareous wacke, in which nevertheless some largish kaolinized felspar crystals have been preserved. A few yards further east, at the end of the outcrop, the rock passes into a coarse fault-breccia, in which the fragments of quartz and quartzite are 6 to 9 inches gauge. In No. 9 shaft, which lies close under the visible outcrop of the felsite, the yellow ground is exposed, from which circumstance it might be inferred that the felsite is a later eruptive and that the kimberlite extends beyond it. There is at this place a stretch of deep sandy overburden, and to set the matter at rest I recommend the sinking of one or more trial pits on the left side of the spruit at about a hundred yards north of No. 9 shaft. An ample water supply, such as is needed for diamond washing on an extensive scale, can be drawn either from the Hartebeest spruit or Koedoes spruit, both being permanent streams. The nearest railway station, that at Silverton, lies at a distance of about one and three quarter miles from the mine."

Consolidated Langlaagte.

Ore milled at the Consolidated Langlaagte totalled 63,047 tons, and yielded 17,499 ounces, or 5.551 dwt. per ton. Accumulated slime treated totalled 36,111 tons, and yielded 2,391 ounces, or 1.325 dwt. per ton. Revenue from current gold totalled £74,334, or 23.581s. per ton; working costs absorbed £57,140, or 18.126s. per ton; leaving working profit £17,194, or 5.455s. per ton. Sundry revenue amounted to £604, and profit from accumulated slime to £6,565, making the gross profit £24,363. Capital expenditure amounted to £218, and debenture interest to £1,125, leaving a net profit of £23,020. The amount expended on new work on the southern section was £104,257. The gross profit shows very little alteration from that realised during the preceding quarter. Working costs were higher, and the profit from current ore treatment was reduced on this account. The quantity of accumulated slime treated, however, was considerably increased, and the profit from this source showed an improvement of £4,023. The east shaft was sunk 215 feet, to a total depth of 2,162 feet, and has reached a depth of 144 feet below the seventh level station. The west shaft was sunk 135 feet, to a total depth of 2,314 feet, which was 96 feet below the eighth level station. The development of the southern section has been sufficiently advanced to permit of some reduction in the scale of operations there. The footage for the quarter amounted to 8,325 feet, as compared with 10,180 feet for the previous quarter. At March 31st the payable ore reserves as this section stood at 1,377,511 tons, of an average assay value of 8.49 dwt. Satisfactory progress has been made with the erection of the new reduction plant.

ORE VALUATION IN RECOVERY WORKS.

The Problem of Tonnages and Extractions—Tonnage Measurement in the Cyanide Plant—The Value of Accurate Estimates at the Outset.

Although an accurate estimate of the actual tonnage milled is readily admitted to be of extreme importance by everyone whose business it is to calculate ore values and recovery percentages, the problem does not appear to have been taken in hand with the amount of scientific thoroughness and persistence by technical societies which has charactertised other metallurgical enquiries on the Rand. In "Rand Metallurgical Practice," Mr. A. McArthur Johnson says: "Since the number of tons treated determines the grade of the ore put through, it is essential that this be estimated very closely for each mine. Only in exceptional cases is the weight of the ore hauled to the mill determined in the trucks, and though an approximate tonnage is got by the number of skips hauled or the number of trucks sent to the mill, it is usually desirable to place more confidence in that estimated in the cyanide plant. One property will differ slightly from another in the specific gravity of the ore, whilst the degree of fineness to which this is crushed may alter the storage capacity quite appreciably over a month's supply. Thus a plant the sand of which at one time measured 21·5 cubic feet per ton was found under different conditions to give 21 cubic feet per ton. The difference means about 12 tons more per 500 ton charge, or close upon 1,000 tons on a plant producing 40,000 tons of sand per month." The sampling of the slime contents of a vat for the estimation of average weight is a still more difficult and unreliable operation. Bearing in mind the importance of obtaining accurate information with regard to the tonnage handled from the mine, the greatest care is taken to perform the measurements required. It is possible that the results are in most cases fairly close to the truth, but instances might doubtless be cited where they are far from being so. The remedy appears to lie in the direction of checking the calculations at the cyanide end by measurements at the crusher station and *vice versa*.

The Influence of Coarse Crushing.

The newer methods of sampling adopted by reason of the coarser crushing policy and the consequent difficulty of getting reliable averages at the screen, tend to accentuate the importance of an adequate system of checking tonnages. In annual reports which are published nowadays it is not uncommon to find it stated that the value of the ore as before crushing has been determined by the mill yield, plus the assay value of the pulp leaving the mill. Previously, when screens of fine mesh were in use, the screen sample was the first and most carefully tested source of information as to values of the ore put into the recovery plant, upon which were based all estimates as to the efficiency of the subsequent operations. The difference between the screen sample assay and that of the tailing sample as it flowed from the amalgamated battery plates gave the theoretical extraction, with which the actual extraction should correspond. If now the mill yield, plus the actual pulp assay from the mill, were to take the place of the screen sample an additional element of uncertainty would be introduced which would be dependant upon the accuracy or otherwise with which the mill recovery is ascertained. This again would depend upon the degree of accuracy of the tonnage estimate, whereas the reliability of the old-fashioned screen sample did not. The error which might arise from miscalculation of the tonnage in the cyanide plant would thus have a wider and more complicated bearing upon the problem of values generally as assessed in the recovery works. As a matter of fact the screen sample, even from the coarsest mesh screens, is not disregarded, but is still used as far as possible for the purpose of checking the value obtained in the manner just described. An investigation into the whole question is being made, and it cannot be doubted that the problem will be solved as closely as conditions will permit.

A Weighing and Sampling Arrangement.

The following details of a combined weighing and sampling scheme in vogue at El Tigre mill, Sonora, Mexico, as given by Messrs. J. W. Malcolmnson and L. R. Budrow in the *Mining and Scientific Press*, appears to be one that is well worth considering in connection with our own requirements: From the bin, the ore falls upon a shaking grizzley, 6ft. long by 1ft. wide, with bars, 2 by ¾in., spaced 2in. apart. The grizzley is operated by a quick-return eccentric drive. The undersize from the screen falls into a short chute or funnel which delivers it upon a ¼in. conveyor belt, travelling at a speed of 180ft. per minute. The oversize falls into a Gates type K No. 1 gyratory crusher, which reduces the ore to a size that will pass a 2in. ring. The crusher feeds on to a 32in. picking belt travelling 50ft. per minute. This travels continuously at 50ft. per minute, and four men are employed, two of them being ore-sorters, who stand on opposite sides of the belt and throw down and to one side. Mr. W. W. Mein has suggested as a preferable arrangement an intermittent movement of the belt in order that the sorters may work to better advantage. This is used in South Africa, the belt moving several feet, then stopping for a few seconds and starting again. Such an arrangement permits each ore-picker to handle the same area under equal conditions. The ore from the picking-belt falls on the 14in. conveyor belt running underneath. It here joins the undersize from the grizzley and is weighed by a Blake-Dennison automatic weigher while in motion. This machine works admirably, recording the weight of the ore with an error of less than 1 per cent. The ore from the 14in. conveyor falls into a revolving cone distributor, which in turn discharges on a stationary cone divided into three segments. This arrangement divides the feed into three portions. One portion, representing 5 per cent., goes to the sampling plant, and the remaining 95 per cent. falls into two compartments with an adjustable partition permitting the distribution of ore to the old stage concentrator or to the new stamp mill in the proportions desired. The 5 per cent. sample falls into a 7 by 10 Blake crusher and is reduced to ½in. size. The crusher discharges into a Snyder disc sampler, eliminating 95 per cent. of the sample; the remaining 5 per cent. is passed through a 2 by 6 Sturtevant roll jaw crusher and quartered down on a steel plate until the quantity is reduced to 50lb., when it is sent to the assay office."

It would seem that a little more trouble taken to secure precision of measurement and sampling at an initial stage of the proceedings in recovery works would save a vast deal of trouble and uncertainty in the later, and, most of all, in the final stages.

The objection to weighing machines is that they have not been uniformly successful, and that, moreover, the presence of moisture in the ore presents a difficulty which militates against consistent valuation. The latter circumstance is, no doubt, the chief disadvantage, because it would not be difficult to adopt a system of actual weighing which would be absolutely reliable. The sampling of rock by automatic means, in the dry, would perhaps involve more work than was desirable in quartering down, and, as far as can be seen, therefore, reliance will continue to be placed upon the screen sample to a very great extent, even where coarse crushing is in vogue. The vessels used for sampling purposes, however, have been found to need modification to meet the newer conditions, though it is not unlikely that the older types are still very commonly in use. The greater splash, for instance, has to be guarded against, for in the finer material which may be projected beyond the edge of the sampling vessel there may be carried a sufficient proportion of waste or low-grade ore to raise the average value of the remainder to an appreciable degree. On the other hand, the narrow slot arrangement of the vessel introduces a possible source of error in the liability of large fragments of crushed ore missing their proper objective. An apparatus devised by H. A. White seems to meet the case of the coarse screen very well, inasmuch as the sample is not taken intermittently across a narrow section of the discharge corresponding with the width of the slot in the vessel used, but at intervals along its whole length of the screen. It is really a kind of trough, of which one side is higher than the other, and in this way the difficulty already mentioned as due to excessive splashing is entirely obviated.

The question of sampling, as has previously been remarked, is one that might profitably be discussed by those members of the Chemical, Metallurgical and Mining Society who are competent to deal with the question; not only in connection with reduction works, but also with regard to underground valuations. It is possible, of course, to overestimate the value of microscopical accuracy in particular operations of this kind, and to disregard the value of those checks at various stages of reduction work which tend to compensate each other. It is impossible to be uniformly and meticulously accurate by any method of sampling under the conditions which prevail on the Rand, but the limits of error are so comparatively small, where a proper system of checks is in vogue, that they compel careful work in every department, and, owing to the huge quantities of material treated, the existence of faulty procedure is sure to be promptly indicated in the records. This continual inducement to avoid undue variation in the records doubtless compensates quite adequately for such small errors as may be made in actual sampling as far as the total result of working is concerned.

THE FUTURE OF THE BANKET SERIES IN THE TRANSVAAL.

A Pessimistic View Likely to Provoke Controversy.

[By David Draper, F.G.S.]

The discovery of gold in the conglomerates of the Witwatersrand led to the establishment of the most important gold mining industry that the world has ever seen, and at present more than one-third of the gold output of all the mining centres is contributed by this comparatively small area, and the bulk of it is derived from one series of conglomerate beds. When the prospectors of the early days first started to open up the banket beds, they discovered gold in almost every conglomerate layer they came across, and many companies were started on what proved to be unpayable propositions—the gold in the Bird, Free State, Kimberley, and Elsburg series, being either in too small quantities or entirely absent. So as the years have passed, there has been a complete abandonment of all the well-known lines of reef, except the Main Reef series, and the old Du Preez, now known as the Rietfontein series. Not only has the Witwatersrand failed to yield another payable gold-bearing series, but though the conglomerate series has been thoroughly explored, from the N'kandhla, in Zululand, to the Spelonken, in the north-eastern Transvaal, and from Wolmaransstad to the Lebombo, no more discoveries of permanent value have been made during the last twenty years. The few mines in outside districts, such as the Nigel in Heidelberg, the New Bonanza in Klerksdorp, were discovered in the very early days of gold mining here. When the conglomerate beds were found to contain gold in payable quantities on Langlaagte and Vogelstruisfontein, the continuation of the particular strata now called the Main Reef series was traced almost to its present limits, within a very short period, probably embracing only a couple of months. From the most southern point on Randfontein to the most easterly outcrop on Modderfontein companies were floated, and these are the only survivals after 25 years of most indefatigable prospecting not only on the Rand, but in every part of the country where a rounded pebble was discovered. In defiance of the optimistic forecasts of those who discovered the conglomerates of the Venterskroon, Klerksdorp, or Heidelberg areas, or who opened up the Haenertsberg or Kantoor beds, and notwithstanding the hopeful anticipations of those who, claiming to be authorities in geological matters, made favourable reports on properties since proved to be worthless, and even in direct conflict with the theorists who have lately tried to prove geological impossibilities, the conglomerate series, beyond the Main and Du Preez lines of reef, must be written off as a complete failure. The man in the street, with a grudge against the capitalist, or the prospector who has a lump of conglomerate from some re-discovered outcrop in his pocket, will confidentially tell you that the Corner House or some other financial group has done all in its power to prevent him from dealing with his property, because it is against their policy to open up new districts, or he will whisper in your ear that they have offered him a large sum of money for his find, but he would not have anything to do with them, and so on, expecting you to believe that the financiers at the head of the mining groups here were a set of imbeciles, who declined to open up new mines when offered to them. Yet recent events show that large sums of money have been spent by these very houses, in exploiting theories and in trying to discover new reefs in various parts of the country. Yet so many small patches of gold-bearing conglomerates have been found in different parts of the series, and upon the whole it has been found to contain gold, though in unpayable quantities so consistently in every part of the country where it has been found to exist, that all the prospecting and even a good deal of the company flotations were justifiable, and must not for one moment be attributed to dishonesty on the part of the promoters. Yet after twenty-five years of hard work, intelligent prospecting, and no lack of funds to carry out the exploitation and development of the mines outside the Main Reef area, those who study the question regarding the future of the banket series most closely must come to the conclusion that the Main Reef and its leaders are a local enrichment, in an otherwise unpayable series, and that consequently all attempts to discover new lines of reef may be set aside as beyond the region of probabilities.

A New Strike at Klerksdorp.

A new strike has been made on the Commonage in the alluvial diggings, says the Klerksdorp paper. It is another and different sort of gravel or clay, bearing diamonds. Up to the present it is confined to a limited area of about two claims by ten claims long. It has a depth, so far as tested, of 15 feet to 16 feet.

Mooifontein Diamonds.

Mooifontein diggings are dwindling down fast, says the Klerksdorp paper. There are, it is estimated, no more than 1,500 whites and 3,000 natives there. The half-share payable to the owner by the Government has dwindled so that it can be estimated that only about 600 licences are paid for. The coming sensation is to be the farm Blesbok, almost adjoining on the west.

WORLD'S DEEPEST BOREHOLES.

Diamond Drilling on Vlakfontein and Witpoort—Valuable Paper by Mr. J. I. Hoffman.

It is not generally known or appreciated that the boring operations carried out on the Lace Proprietary Mines constituted a world's record. In the case of the Vlakfontein hole, it reached a depth of 6,656 feet (measured along the rods), the deepest borehole in the world. Once the hole left the vertical at a depth of 1,000 feet, the angle of deviation continued to increase gradually until, at the bottom, the hole was dipping 58 degrees from the vertical. These drilling operations formed the principal subject of a most interesting and instructive paper read at a meeting of the Institute of Mining and Metallurgy, on April 18th, by Mr. J. I. Hoffman, late of Johannesburg, and now a partner in the firm of Johnson and Hoffman, Consulting Engineers, London. Mr. Hoffman, after paying a tribute to the important paper read by Mr. Marriott on Deep Borehole Surveying, in February, 1905, remarked that diamond drilling had made considerable progress since then, and as, in his opinion, the importance of diamond drilling could not be over-estimated, he would endeavour to describe the most recent improvements which had taken place, both as regards the drilling and surveying of boreholes. In abbreviated form, his paper is as under:—

The surveying instrument which is now exclusively used on the Rand, was invented by Mr. Oehmen* and improved upon by Mr. A. Payne-Gallwey. The instrument is an electric light photographic apparatus and consists essentially of a gun-metal tube in two halves connected by a coupling. In the lower half of the gun-metal tube are placed a magnetic needle and a plumb-bob, each independent of the other and each swung over a gimbal. Above the needle and plumb-bob, respectively, is fixed a small electric lamp and all are held in position and pressed against an insulated brass rod in the centre of the coupling, by a spiral spring attached to the bottom screwed plug. In the side of the tube a series of small screws are placed in a straight line parallel to the side, their ends projecting inside the tube about one-sixteenth of an inch. The cylindrical cases carrying the lamps and those carrying the needle and plumb-bob have a slot down the side, the projecting screws acting as guides for the slotted cases to slide into and keep them in position. The top half of the tube contains a dry battery and a clock, which has a spiral spring attached to it. The spring presses against the top end-piece of the tube so that when the two halves of the tube are screwed together everything inside is held rigidly together and contact assured by means of the spiral springs at top and bottom. To the top end-piece a ball-bearing swivel is attached in order to lower the instrument on a wire, if necessary. The cases which carry the marine compass attachments for the magnetic needle and the plumb-bob are made of vulcanite, for insulating purposes, the compass attachments being made of brass, the outer ring of which is held in position by two brass screws on which the ring swings. On the face of each gimbal is a fixed pin point, and round the edge is a recessed ring which holds the disc of sensitised photographic paper in place, the pin points holding them in position. The plumb-bob is made of gold attached to a fine silk thread swung from the centre of a thin disc of plate glass, which fits into a recess in the top of the vulcanite case. Both the magnetic needle and the plumb-bob swing immediately above (almost touching) the sensitised papers. The watch has an extra wheel to which is attached a copper projection which at a certain set time makes connection with a copper spring attached to the frame of the watch and completes an electric circuit, lighting up the lamps above the plumb-bob and the needle and photographing a sharp shadow of each on the sensitised paper. When the two photographs are developed, the dip and direction can be read off by making the pin pricks coincide. I will now describe two of the most important holes which have recently been sunk, both successfully, on which the latest inventions were used. The two holes in question are (1) the hole put down by the Lace Proprietary Mines on the farm Vlakfontein in No. 26 in the Heidelberg District of the Transvaal, and (2) the hole put down to the south of the Brakpan Mines on the portion of Witpoort No. 162 belonging to the South African Lands and Exploration Co., Ltd. Both of these holes were put down by the same contractor, Mr. Wm. Gallagher, of Johannesburg. I take this opportunity of mentioning his name because in both cases he created a world's record. From 1,000 ft. to 2,600 ft. the rods deflected gradually from the vertical to 41 degs., but continued at more or less that angle of dip down to 5,000 ft., where the deflection again commenced to increase, until at 6,600 ft. (the lowest depth surveyed) the dip of the hole was 58 degs. from the vertical. The reef was struck at 6,198 ft. (measured along the rods), the calculated vertical depth being 4,813 ft. The horizontal distance between the points where the reef was struck and the borehole commenced was 3,259 ft. Owing to the great expense of sinking these deep boreholes and only getting one section of the reef, an idea of Mr. Welldon's (at that time foreman driller on the Apex borehole) was improved on, and carried out by Mr. A. Payne-Gallwey, of Johannesburg, whereby another section of the reef could be taken from the same borehole, in any required direction, by means of a deflecting wedge. This contrivance consists of a pilot wedge, a guide wedge, and a main deflecting wedge. The Lace Proprietary Mines, Vlakfontein, borehole was commenced in November, 1908, and was finished in November, 1909. In April, 1910, it was decided to try and obtain another cut of the reef, commencing the deflection about 800 ft. above the bottom of the hole, and this work was carried out successfully as follows:—As the hole had been standing for five months a considerable amount of sediment had settled in the bottom and this had to be cleared out first of all, which was done by drilling with a blank crown attached to the rods to loosen the sediment, the pump forcing it with the water to the surface. Then 150 ft. of old drill rods were dropped down the hole. The main rods were next lowered with the machine, and it was found that the bottom of the old rods had stuck in the hole 10 ft. from the bottom. The main rods were then raised and 425 ft. of old rods were screwed together, on top of which 200 ft. of $1\frac{1}{4}$ in. diam. black piping were screwed and the whole length of 625 ft. dropped down the hole. The reason for screwing this piping on the top of the old rods instead of using the whole 775 ft. of old rods was because the old drill rods were magnetic to a certain extent and would affect the needle of the survey instrument used, whereas it was found that the ordinary black water piping had no appreciable magnetism at all. To the top length of the $1\frac{1}{4}$ in. pipe a pilot wedge was attached. The position of this wedge was surveyed and the main deflecting wedge and guide wedge set so that the deflecting cut would be immediately opposite the direction in which the borehole was dipping. Drilling was then re-started with a "C" bit and rods ($1\frac{5}{8}$ in. diam.) the deflection from the old hole commencing at a depth of 5,872 ft., and was continued down to a depth of 6,160 ft., where the footwall of the reef was again intersected. From the above it will be seen what an enormous advantage is gained by means of the ingenious contrivance of a deflecting wedge, as in this case a second complete section of the reef was obtained at a distance of 60 ft. horizontally from the point where the reef was intersected in the original borehole, for the cost of drilling only 287 ft., as against 6,160 ft. had a second hole been sunk from the surface. The necessity of reducing the diameter for the deflected portion of the hole has now been overcome by an ingenious invention of Mr. Wm. Gallagher, who for many years has been one of the leading diamond drill contractors on the Rand, where, I think I am right in saying, diamond drilling has attained a high standard of perfection. By Mr. Gallagher's invention, a succession of deflections can be taken from a borehole and each deflected portion kept the same diameter as the original hole. This was successfully carried out in the Witpoort borehole under my immediate supervision, where four successful deflections were made down to a depth of 1,500 ft. owing to the hole either deviating from the vertical or taking a wrong direction. All the above three holes were started with "P" rods and, although the deflecting wedge was known at the time they were sunk, it would have been impracticable to deflect any one of them and reduce the size of the core, because only two deflections, from size "P" to "B" and from "B" to "C," could have been made, and, after the second deflection, the hole would have had to be continued to the bottom with "C" rods, which, of course, are much too light for that depth of hole. Consequently, arrangements were made with Mr. W. Gallagher to sink a hole, under severe penalties, and he not only guaranteed to drill through the reef horizon, but also to finish the hole with "B" rods, owing to his invention whereby he could deflect as many times as might be necessary without reducing the size of the hole. As he found from experience that "P" rods deviated quite as much as "B" rods, he used the latter for this hole. Every precaution was taken to keep the hole plumb, a special core-barrel, 30 ft. long, and having the same diameter as the crown, being used. The hole went down vertical for 200 ft., when, owing to the broken nature of the ground, it commenced to deviate, and at 525 ft. was dipping at 8°, and pointing 65° E. of N. The dip was not excessive, but the direction was entirely wrong, as the hole was almost following the same direction as the dip of the reef. The first deflection was put in at this depth, with the result that at 550 ft. the survey showed the dip to be 4° and the direction 20° E. of N. The dip gradually increased, and the direction continued to come round to the eastward till at 730 ft. the dip was 14° and the direction 40° E. of N. Another deflection was put in at 679 ft., and on surveying at 708 ft. it was found that the direction was 10° W. of N. This was a very satisfactory deflection as it not only reduced the dip by 2° but it also brought the rods round 50° in the right direction. On surveying at 1,160 ft., the dip was found to be $23\frac{1}{2}$° and the direction 41° E. of N. Another deflection was therefore put in at 1,100 ft. The survey at 1,200 ft. showed the dip to be 17° and the direction 57° E. of N. At 1,500 ft. the dip had increased to $24\frac{1}{2}$°. Another deflection was put in at that depth, and at 1,550 ft. the dip was brought back to 22½° and the direction to 31° E. of N. As at this depth the drill was in solid quartzite, I considered it safe to continue without making any more deflections, knowing that if the dip got excessive I could always decrease it at least 2° by each subsequent deflection. The dip continued to increase with fair rapidity to a depth of 1,970 ft., where it was 37° and the direction 40° E. of N. From that point to 3,000 ft. the dip only increased 1°, but the direction gradually came round to 62° E. of N., after which it turned back to 46° E. of N. at 3,500 ft., and kept that direction, only varying slightly, to the bottom of the hole, the dip having increased another 13°, until it was 51° at 5,200 ft., the last point surveyed. It will be of interest to mention, as illustrating the enormous pressures met with, that at a depth of 5,600 ft., the bottom of the hole, the surveying instrument actually collapsed.

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* This instrument was the subject matter of a paper read by Dr. F. H. Hatch, before the British Association in 1905, entitled "An Instrument for Surveying Deep Boreholes." (British Association Report, 1905).

MARCH YIELD, COSTS, AND PROFITS.

Randfontein's Decreased Profits—Some Notable Changes.

The usual monthly analysis of the gold production for March issued by the Chamber of Mines is presented hereunder. It will be noticed that the working profits for the Witwatersrand have been supplied by 57 companies out of a total number contributing of 59; one concern included, but not returning profits, being a private venture, and the other, a small mine, does not supply details.

The Witwatersrand

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
1. Aurora West United ...	14,425	23	4	19	8	12,127	2,359	3	10
2 Bantjes Consolidated ...	34,772	29	9	24	10	28,465	8,693	5	0
3. Benoni Consolidated ...	18,486	18	8	18	8	18,479	*244	*0	3
4. Brakpan Mines	71,918	30	6	17	7	41,094	26,119	11	2
5. Cinderella Consolidated	27,360	31	8	25	11	22,404	5,027	5	10
6. City Deep	68,163	33	6	22	10	45,662	20,462	10	3
7. City and Suburban ...	49,911	37	3	22	2	29,412	46,150	14	10
8. Cons. Langlaagte	29,768	24	5	20	5	21,630	8,136	7	8
9. Cons. Main Reef	30,877	28	5	20	2	21,842	8,573	7	11
10. Crown Mines	257,884	31	10	18	3	147,755	126,402	13	2
11. Durban Roodepoort ...	15,343	21	8	15	9	11,167	4,177	5	11
12. Durban Rood. Deep ...	36,029	28	8	23	11	30,103	5,447	4	4
13. East Rand Proprietary	280,975	33	7	21	5	174,819	101,362	12	5
14. Ferreira	31,331	25	10	16	0	17,966	21,013	9	6
15. Ferreira Deep	77,258	45	6	22	10	38,737	37,612	22	2
16. Geduld Proprietary ...	19,289	26	4	21	3	15,590	3,652	5	0
17. Geldenhuis Deep	82,703	27	11	24	0	70,766	12,507	3	8
18. Ginsberg	20,963	30	0	21	3	14,858	6,104	8	9
19. Glencairn Main Reef...	15,891	15	9	14	11	15,496	2,397	2	8
20. Jumpers-cum-Treasury	17,823	39	5	33	10	14,474	1.524	3	7
21 Jupiter	43,934	21	7	16	8	33,952	7,283	3	7
22 Knight Central	26.191	21	7	19	5	23.013	2,742	2	4
23. Knights Deep	51.330	16	11	11	2	33,712	17,013	5	7
24. Lancaster West	24,034	20	0	21	5	23,349	452	5	0
25. Langlaagte Estate ...	59,901	19	10	—		—	11,100	4	1
26. Luipaardsvlei Estate ...	16.005	17	7	17	3	14,832	94	0	1
27. Main Reef West	26,548	34	1	22	7	17,564	8,619	11	1
28. May Consolidated ...	16,082	26	5	16	6	10,033	6,012	9	11
29. Meyer and Charlton ...	34,050	47	8	17	10	12,735	17,094	23	11
30. Midas Deep	833	10	10	—		—	—	—	
31. Modderfontein B ...	61,477	38	5	19	1	30.513	54.636	18	10
32. New Goch	27.725	22	0	18	10	23,726	3,966	3	2
33 New Heriot	21,697	36	3	22	0	12.506	13,148	15	7
34. New Kleinfontein ...	55,582	27	10	20	5	40,662	14,112	7	1
35. New Modderfontein ...	86,531	35	2	21	3	51,960	72,721	13	9
36. New Primrose	34,266	27	1	14	9	17,696	16.569	13	10
37. New Rietfontein	21.315	26	1	21	9	17,748	3,569	4	4
38. New Unified	16,889	29	3	22	8	12,269	4,620	8	6
39. Nourse Mines	80,928	30	2	22	2	58,763	23,598	8	0
40. Princess Estate	22,662	25	10	27	10	24,377	*1,772	*2	0
41 Randfontein Central ...	260,615	22	5	—		—	53,000	4	7
42. Robinson	106,117	45	5	16	9	39,173	109,924	28	1
43 Robinson Deep	87.346	31	6	16	5	45.499	37,002	13	4
44. Roodepoort United ...	31,888	21	1	17	8	26,784	4,107	2	9
45. Rose Deep	95,098	29	2	17	8	57,725	61,939	11	1
46. Simmer and Jack ...	91.101	24	1	11	5	42,068	45,388	12	4
47. Simmer East	29,352	18	7	15	1	23,789	5,156	3	3
48. Simmer Deep	43,552	19	2	16	9	38,074	3,470	1	6
49. Spes Bona Tribute ...	5,875	20	5	—		—	—	—	
50. Van Ryn	60.726	30	7	15	2	30.241	25.051	12	7
51. Village Deep	78,061	30	6	20	0	51.200	50.478	10	1
52. Village Main Reef ...	57.874	36	1	20	9	38,420	32,437	14	10
53. Vogelstruis Estate ...	12,607	22	6	23	3	11,710	861	1	8
54. West Rand Central ...	4,163	26	2	27	2	3,826	339	2	5
55. West Rand Cons.... ...	34,870	24	6	21	7	30,753	4,177	2	11
56. Witwatersrand	46,780	24	1	15	11	31,104	15,877	8	2
57. Wit. Deep	55,526	29	0	16	6	37,297	17,503	9	2
58 Wolhuter	41.309	27	6	17	1	25,635	15,007	10	0
Miscellaneous producers	18.152	—		—		—	—	—	
Witwatersrand totals	†3,384,400	28	1	18	11	—	1,204.764	9	0
				56 cos.			56 cos.	56 cos.	

*Loss.

†Includes £280,039, value of gold reserves as existing at February 29, brought into March declarations.

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

Outside Districts.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
Heidelberg—									
1. Nigel	20,521	28	4	23	0	16,101	4,188	6	0
2. Sub Nigel	8,156	35	9	30	11	7,064	533	2	4
Barberton—									
3. Barrett	807	5	10	—		—	—	—	
4. Sheba	12,369	41	3	24	9	7,420	4,529	15	1
5. Sheba (Rosetta)	1,640	17	10	—		—	—	—	
6. Worcester	5,407	21	0	—		—	—	—	
Lydenburg—									
7. Glynn's Lydenburg ...	7,969	50	2	18	4	2,909	4,924	31	0
8. Transvaal G.M. Estates	29,402	59	11	27	10	18,286	26,383	31	6
Miscellaneous producers	34,110	—		—		—	—	—	
Tl. (outside districts)	*144,288	37	9	25	4	—	40.557	17	1
				5 cos.			5 cos.	5 cos.	

*Includes £13,907 for reserve gold declared.

A comparison of value recovered per ton milled, working costs and profits per ton with February shows that the value recovered on the Witwatersrand for February was 28s. 3d. or 2d. per ton more than for March. Working costs in March were 18s. 11d. as against 19s. 2d. for February, 18s. 10d. for January, and 18s. 5d. for December. For January, 1911, the tonnage milled was 1,855,232; for February, 1,712,198 tons; for March, 1,960,678 tons; for April, 1,926,583 tons; for May, 2,002,926 tons; for June, 1,989,559 tons; for July, 2,095,220 tons; for August, 2,107,809 tons; for September, 2,037,329 tons; for October, 2,083,900 tons; for November, 2,089,387 tons; for December, 2,030,437 tons; for January, 1912, 2,067,161 tons; for February, 1,980,396 tons; and now for March, 2,163,998 tons. In the outside districts the total tonnage milled in March was 50,626 tons, making a total for the Transvaal of 2,214,624 tons.

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Rhodesian Section.

LATEST MINING NEWS.

Bucks Reef Rumours—The March Output—The Tivoli Claims—Kimberley Mashonaland Mine—Lonely Developments—Equipping the Moss Mine—Victoria Tin—Latest from the Shamva.

The numerous rumours lately in circulation regarding the Bucks Reef are unfortunately incorrect. According to report a "rich strike" has been made in the mine, but the manager denies that this is the case, and on the contrary reports that the development is turning out badly and the grade to the mill falling off. The truth of the adage that in mining one cannot see beyond the end of the miner's pick is, it seems, well exemplified in the case of the Bucks Reef Gold Mines. It may be recalled that Mr. W. H. Dawe, presiding at the ordinary general meeting, admitted unhesitatingly that the work of the past year had been exceedingly disappointing, due to circumstances entirely beyond the management's control. Expectations have been far from realised in the values obtained from some of the blocks of reef, which, in many cases, have fallen considerably short of the development assays. Mr. Dawe emphasised the uncertainty which seemed to be inseparable from quartz mining, favourably comparing the Rand with Rhodesia in this connection. Another adverse factor in the year's operations was the restricted labour supply. The output of this company for last month was £2,029 from the mill and £417 from tailings.

* * * *

The total value of Southern Rhodesia's mineral output for March has been officially declared at £228,806, as compared with £224,982 for February. The complete figures for the two months read as follows:—Gold, February, £209,743, March £215,102; silver, February £1,470, March £1,585; chrome iron, February £7,000, March £6,025; lead, February £633, March £698; coal (sales), February £6,036, March £5,396; wolframite, February £100, March nil. From the above figures it will be seen that the bulk of the increase-value was due to the improved gold return, the variations in the other producing sections being, as usual, trifling. The constant fluctuation in the production from the chrome iron deposits is due largely to varying railage and shipping facilities, but the continued decrease in the sales of coal from the Wankie Colliery is anything but a satisfactory feature. This latter will not, of course, be taken as meaning that there is anything wrong at the colliery itself, where, as a fact, the position never looked more satisfactory than at present, but it does, however, indicate that, pending actual ore treatment operations at a number of mines now in the development stage only, no very great change in the country's coal consumption can be expected.

* * * *

The gold output, at 51,072 ozs., worth £215,102, shows an increase over that for February of 1,209 ozs. in weight and £5,359 in value—not so large an increase as might have been expected when the running time for the two months is compared—and it shows, in fact, a substantial decrease when contrasted with the corresponding month of last year. In the Bulawayo district there were 53 producers as compared with February's 49, and the output, at 11,686 ozs shows an increase of 652 ozs. The chief increases here were recorded by the Bucks Reef (582 ozs. from 828 tons), the "C" (444 ozs. from 2,067 tons), the Claremont (705 ozs. from 2,502 tons), the Lonely (2,807 ozs. from 2,220 tons), the Queens, the Susanna Mines, and the Tuff Nut (542 ozs. from 700 tons); the decreases were registered by the Bush Tick (708 ozs. from 4,486 tons), the Farvic (512 ozs. from 740 tons), and the Old Nic, which, with a return of 343 ozs. only, shows a substantial decline; the Northern Star, whence excellent developments are reported, gives a practically unchanged output at 430 ozs.

The number of producers in the Gwelo district during March was 26, or the same as in the preceding month. There was an increase in output from this mining division of 410 ozs. The Globe and Phoenix as usual heads the list with a return of 4,452 ozs. from 5,191 tons crushed, which constitutes a small improvement on the preceding return. Other increases have been recorded by the Arizona No. 2, the North Bonsor, the Tebekwe, and the Wanderer. The Selukwe-Columbia's return registers a decline mainly, no doubt, on account of the recent water shortage. The Hartley area was also affected by scarcity of water, and several decreased returns are shown. On the other hand, better outputs were sent in by the Giant, Kanyemte, Masterpiece and Pickstone. The Tyne—a recently floated venture—records a first return of 601 ozs. from 2,755 tons milled.

* * * *

The Lomagundi district, with its number of contributors unchanged, sent along a total of 4,756 ozs., a slight decrease on February's figure. The Eldorado, the stand-by of this district, returned 4,410 ozs. from 7,608 tons treated, and the only other feature of interest here, a rather melancholy one, is the item, "Ayrshire, clean up," 60 ozs. The Mazoe district with nine producers, or one less, returned 2,231 ozs., a decline of 411. Items here are the Jumbo output, 1,034 ozs. from 3,000 tons, and that from the Hay, 672 ozs. from 1,900 tons, the latter a distinctly disappointing one. The Salisbury and Umtali returns for last month show no features of special interest, though the last-named records slightly improved figures; but it is pleasant to note that, after an absence of many months, the Victoria district once again makes an appearance in the list.

* * * *

According to Rhodesian advices, the Tivoli Syndicate, which has been doing a lot of work recently in developing a large body of serpentine stockwork on the Tivoli claims, has struck some very rich values during sinking operations below 60 ft., as well as in driving. The Tivoli claims, which are situated about four miles from Hartley, give every promise, so it is stated, of being a highly successful property.

* * * *

The Mashonaland Agency, the Rhodesian agents of the Kimberley Mashonaland G.M. Co., despatched the following cablegram in mail week to the board of the company in London, regarding developments on the Kimberley mine: No. 2 winze west No. 4 level at 47 ft. (or 497 ft. total depth) assays 1 oz. 2 dwts. over 31 inches.

* * * *

The following is a copy of a cablegram which was despatched in mail week from Bulawayo to the Board of the Lonely Reef G.M. Co. in London: No. 8 level (at depth of 928 ft.) cross-cut reached footwall of reef on 25th inst. at 102 ft. from shaft. Reef since cut through 46 ins. wide assaying 1 oz. 5 dwts. per ton. Reef cut in lower grade section corresponding with No. 7 level: expected to improve on driving.

* * * *

Messrs. G. Austin and Ericksen are removing their Tremain mill from their old property, the Lily, which is now closed down, and are erecting it on the Moss, a small property on the Rennie-Tailyor Concessions, which they have taken on tribute.

* * * *

The *Rhodesia Journal* reports that the tin claims under option to Willoughby's Consolidated, in the Victoria district, are developing in a highly satisfactory manner at depth. A few months ago it looked as though the rich promise of the surface would be belied, for the samples taken out of the numerous prospecting shafts at depth were by no means encouraging. Latest news, however, shows that the tin contents are improving, and there is now every prospect of a payable proposition being opened up.

* * * *

It is understood that the native compound at the Shamva is to be enlarged to accommodate 1,000 natives. There appears to be no difficulty in obtaining plenty of labour in this district. The Shamva on present developments promises to become one of the biggest mines in the world. The Shamva Option's property, which has recently gone into liquidation, has claims at the foot of the Shamva Hill and at 200 ft. 17 dwts. ore was encountered only a few weeks ago. Why they could not raise the necessary £3,000 to bring the property to the crushing stage seems passing strange.

Romola Nigel.

The following is the manager's report for the quarter ended March 31st :—Eastern Queen's, main shaft : Sunk 45ft. 6in., depth 170 feet. Assay value, 10 dwts. across 41.35 inches. This shaft is timbered 150 feet. Driving north and south has been started and carried 17 feet each way; average value (assay), so far, 9.4 dwts. across 36 inches. North drive, 1st level, has been driven 10ft. 9ins., length, 57 feet. Assay value 55.4 dwts. across 24 inches. Cross-cut west, 2nd level, 5 feet. Total development, Eastern Queen's for quarter, 49ft. 9ins. Granger, main shaft : Sunk 65 feet, depth 65 feet; timbered 15 feet deep around collar. Development, No. 1 winze, north drive, extended 7 feet 9 inches to 26 feet. South Drive extended 13 feet 6 inches to 30 feet 6 inches; assay value 3.5 and 14 dwts. across 6.5 inches and 19.5 inches, respectively. Total development, Granger Mine for quarter, 21 feet 3 inches. Claydon Mine, main shaft; Sunk 28 feet 3 inches; total depth, 160 feet; shaft timbered 18 feet; total timbered 90 feet. Ladderway has been fixed from 100 feet to 160 feet; steam pump has been fixed at 160 feet level The shaft is now making 5,000 gallons water per 24 hours. Total development, Claydon Mine, 372 feet. Grand total footage, main shafts, 138 feet 3 inches; grand total footage, development, 443 feet. Mill : The five stamp mill ran 60 days (1,441 hrs.) : crushed 1,331 tons, made up as follows :—Claydon Open workings, 251 tons; Claydon stope workings, 190 tons; Claydon development workings, 874 tons. Eastern Queen's development, 16 tons : fine gold recovered by amalgamation, 502.33 ozs.; realised value, £2,112 16s. 6d., equal to 7.54 dwts. or £1 11s. 8.9d. per ton. Cyanide works treated 957 tons. Fine gold recovered, 128.91 ozs., realised value, £511 12s. 9d., equal to 2.69 dwts., or 11/3.83 per ton. Total fine gold recovered from mill and cyanide, 631.2 ozs., from 1,331 tons milled; value £2,645 9s. 3d., equal to 9.47 dwts. or £1 19s. 10.6d. per ton. Total spent on revenue account, £2,047 9s. 3d.; profit, £607 Expended on capital account : Development (443 feet), £616 6s. 7d.; main shafts (138 feet 3 inches), £881 11s. 11d.; machinery and plant, £171 6s. 5d.; buildings, £136 16s.; sundries, £21 17s. 9d.; total, £1,827 18s. 8d.; total spent on revenue and capital accounts, £3,875 7s. 11d. Eastern Queen's Mine :—Now that the main shaft has reached the 2nd level we are in a good position to develop a large tonnage by extending our drives on the 1st and 2nd levels. Granger Mine :—The main shaft will reach the 1st level in April. We shall still have a cross-cut of 20 to 30 feet to drive, to intersect the reef under the largest of the ancient workings. Claydon Mine :—The development on the 160 feet level has so far proved three parallel reefs for a distance of 70 feet. On the north, the reef is faulted west. A cross-cut is being driven and we expect to strike one of them in about 40 feet as we are developing on this reef on the 100 feet level north of the fault. Main shafts :—The cost of main shafts includes pitch pine setts, lagging and ladderway complete, and works out at £6 7s. 9d. per foot. Machinery and plant :—A steam pump has been fixed in Claydon shaft. Buildings :—The manager's house has been completed. Native labour :—The number of "boys" on our pay-sheet on March 31st last was 138, as compared with 90 on the 31st December last, showing a gain of 48 during the quarter. All our "boys" are recruited locally, and we have no expense in securing them. Machinery :—All machinery has been kept in a very efficient condition. Conclusion :—Owing to faults both north and south of Claydon main shaft we are pushing on with the north cross-cut, and have intersected the porphyry to the north of the north fault, and trust soon to get on to values. On the south of main shaft we are prospecting on surface, and have found float about 300 feet away, giving about 12 dwts. pannings. We are pushing on with this, and hope it will lead on to the reef. On the first of May we take back the Eastern Queen's Mine from the contractor, and we shall then be in a position to develop and mine some of the richer ore for the mill with the same number of "boys" which we are now working. With this we can reduce the strain on Claydon and confine work there only to development.

The Phthisis Bill.

GOVERNMENT ACTUARY'S REPORT.

The second report of the Government Actuary regarding the Miners' Phthisis Bill is dated Capetown, April 13, and states that the Miners' Phthisis Board up to the 11st inst. had received 937 applications, of which 57 were postponed sine die, 111 were standing over, 563 had been disposed of, and 206 were not yet ready, while £22,387 had been allotted in grants, and £26,902 in annuities, making a total of £49,289, giving an average allowance for each case dealt with of approximately £88. Mr. McPhail gives an analysis of an examination of two lots of comparatively recent applications to the Board with a view to ascertaining the proportion of married men and the number of children and their ages, and comes to the conclusion that taking one thousand miners as a basis the number of married men would be 885, as compared with 700 deduced by the Medical Commission; the number of children under 16 comes out at approximately 2,110, compared with 1,500, and the average age came out at about 6¼ years in place of eight years. Mr. PcPhail mentions that the proportion of miners of South African birth now applying to the Board is much greater than among the earlier applicants, this partly accounting no doubt for the larger proportion of married men and children. Under present conditions he arrives at the following position of the fund at the end of twenty years, when it should have attained a normal condition. He estimates that 8,000 widows will be drawing annuities totalling £288,000; 19,000 children will be drawing annuities making £228,000, while 2,000 miners will be drawing annuities amounting to £202,000, making a total annual charge of £718,000. If the contributions were continued on the basis given in the Bill they would be approximately £475,200, leaving a shortage of £242,800. Mr. McPhail adds that the figures are not intended to indicate what the working of the fund will be in practice, but to bring into prominence the fact that when arriving at the contribution basis adopted in the Bill one consideration was given to the fact that a great deal had already been done, and a great deal more would shortly be done to eliminate miners' phthisis from the Rand mines. In conclusion, he strongly advocates that the scales of contributions should not be less than those given in the Bill.

Borehole Temperature a Prospecting Guide.

Hitherto it has generally been assumed as established by practical experience that the temperature of the earth increases by 1 deg. C. for every 35 metres increased depth. But of late, Professor Jacob Koenigsberger, of Freiberg, while conducting investigations regarding boreholes in depth, has made certain observations which may be of the greatest importance for the future of the mining industry. He found that the increase in temperature does not take place uniformly, but that it proceeded much more rapidly in boreholes sunk in the neighbourhood of ore deposits, the reason being presumably that, owing to certain chemical processes, heat is constantly generated there. In the vicinity of coal measures the temperature increased by 1 deg. for every 26 to 30 metres. The change was particularly rapid near mineral oil deposits, where every 8 or 11 metres increased depth advanced the temperature by 1 deg. Professor Koenigsberger draws from his observations the conclusion that from the change in the temperature of boreholes the occurrence of coal or mineral oil within 200 metres of the bore may be prognosticated. Investigations with the object of testing Professor Koenigsberger's theory are now being vigorously conducted by other experts.

E. J. MOYNIHAN,
CONSULTING ENGINEER.
PLANS, SPECIFICATIONS, REPORTS AND ADVICE, MINING
EQUIPMENT, STRUCTURAL WORK AND
FINANCIAL ADVICE.
10, ANGLO-AUSTRIAN BUILDINGS. Box 2061.

RHODESIA'S MARCH MINERAL OUTPUT.

Returns in Detail—Many Improvements Recorded.

We have received from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of March, 1912, with comparisons and values:—

GOLD.

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
BULAWAYO DISTRICT—				
Agincourt (Est. S. Roodt, deceased) ..	5	371	223.50	939
Alice (R. Barkley)	10	990	169.01	710
Aln (W. H. Robinson)	2	170	35.14	148
Do. (tailings)	—	156	19.19	80
Antenior (E. Granger and Co.)	2	200	79.02	332
Bengali (Arbery & Hicks)	5	313	143.93	604
Do. (tailings)	—	156	16.03	67
Big Ben (W. E. Hunt)	4	91	117.50	493
Blanket (Forbes Rhod. Synd.)	15	1000	113.43	476
Bridge (Bell & Ralstein)	2II	300	23.17	97
Bucks Reef G.M., Ltd.	5	828	483.06	2029
Do. (tailings)	—	603	99.33	417
Bulawayo Main A (R. A. Myburgh) (tailings)	—	750	69.78	293
Bushtick Mines, Ltd.	20 1C 2T	4486	46.01	193
Do. (tailings)	—	2517	515.51	2165
Do. (slimes)	—	1812	147.13	618
"C" (D. & C. Syndicate)	10 1C	2067	185.79	780
Do. (tailings)	—	1539	136.39	573
Do. (slimes)	—	528	122.22	513
Central D.B. (A. D. Gunn) (tailings)	—	200	9.76	41
Claremont Mines (Rhod.), Ltd.	20	2502	705.86	2965
Clean Up (Belingwe G.M. Synd.).. ...	5	120	205.28	862
Champion, 1S.E. (R. Aserman)	5	321	107.88	453
Do. (tailings)	—	275	86.59	364
Cumberland (J. Millin)	5	93	37.19	156
Donald (H. Kerr) Feby.	3	8	4.65	20
Eagle 1SE (H. J. Collins) (Pannings)	—	—	3.58	15
Eagle, 1S.E. (Peard & McDonald & Co.)	5	437	111.69	469
Do. (tailings)	—	428	42.31	178
Farvic (Rhodesia, Ltd.)	6 1P	740	360.32	1513
Do. (tailings)	—	500	71.00	298
Do. (slimes)	—	240	81.06	340
Glenmark, Feb. & March (A. D. Hill)	5	372	49.94	210
Do. (tailings)	—	693	24.45	103
Intabanenda (Est. of B. Smallie deceased)	5	96	10.00	42
Do. (tailings)	—	40	6.00	25
I.X.L. (Forbes Rhod. Syd. Ltd.). ...	5	164	133.40	560
Kalydon (Rose Mine Synd.)...	5	260	112.18	468
Khami (Cock Bros.)	H	64	17.09	72
Koba (Koba Syndicate)	5	260	64.11	269
Lemon (Anderson & Mayes) (Feb.) ...	2	170	48.46	204
Do. (March)	2	98	31,14	143
Li Hung Change (G. Leach)	3	148	27.37	115
Lonely Reef G.M. Co., Ltd.	15 1T	2220	750.92	3154
Do. (slimes)	—	4235	2056.66	8638
Mohem-(tailings) (D. Henchly) (Feb.)	—	500	13.41	56
Do. (March)	—	450	30.18	127
N'Daba (M. Westerberg)	2	32	18.81	79
New Eclipse (J. R. Stewart)	4	320	143.51	603
New Robin A (E. T. Clayton)	2	100	30.08	126
Northern Star and Kimono (Peel's R. Syndicate, Ltd.)	10	1100	404.98	1701
Do. (tailings)	—	800	25.10	105
Old Camp (Coleman & Barrett)	5	65	20.56	86
Old Nic (Chart. & Gen. E. & F. Ltd.)	12 3P	690	281.20	1181
Do. (tailings)	—	599	61.80	260
Paauw (F. E. Davis)	5	165	48.38	203
Peach (C. Salomon)	5	80	126.37	531
Penzance (R. Urquhart)	2	70	14.92	63
Do. (tailings)	—	80	39.46	166
Progress (H. V. Batten)	5	460	30.00	126
Queen's (Matabele Queen's Co., Ltd.)	10	1451	601.23	2525
Do. (tailings)	—	447	47.31	199
Queen's W. (Cummings & Berry)... ...	3	405	82.18	345
Do. (tailings)	—	432	134.71	566
Rainbow (tailings) (T. R. Webb) ...	—	163	34.69	146
Riverbank (R. Martindale)	2	200	55.41	233
Riversdale (Bruhns & Schwarz)	4	169	78.43	329
Romola Nigel G.M. Co., Ltd. (Claydon)	5	516	234.53	985
Do. (tailings)	—	315	43.47	183
Spitzkop (Mrs. H. Smallie)	5	174	42.11	177
Do. (tailings)	—	140	11.95	50
Starr tailings (L. N. Papenfus)	—	128	16.67	70
Suffolk (H. D. Bishopp)	5	65	41.18	173
Susanna Mines, Ltd. (Lady Lina) ...	8	447	362.21	1521
Do. (tailings)	—	387	70.22	295
Do. (slimes)	—	732	75.77	318
Trump (J. W. Thraves) (February) ...	5	20	6.72	28
Do. (March)	5	28	9.69	41
Tuff Nut (King's Synd.)	5	700	503.95	2117
Do. (tailings)	—	400	38.39	161
Bulawayo District Total			11,686.61	49,079
GWELO DISTRICT—				
Arizona No. 2 (tailings) Marchant and Simpson)	—	750	65.42	275
Arizona, No. 2 S. (Williams & Woodger)	2	235	298.39	1253
Beppo (J. Maleham)	6	245	93.13	392
Broad Arrow (Broad Arrow Syn.) ...	10	454	82.50	347
Do. (tailings)	—	316	15.07	63
Bute (T. Pedlow)	5	55	20.95	88
Conqueror tailings (Williams and Woodger)	—	580	86.92	365
Csardas (Wolfshall Syndicate)...	10	393	328.10	1378
Do. (tailings)	—	378	58.84	247
Don No. 1 (Don Prop. Mines, Ltd.) ...	5	448	71.10	299
Do. (tailings)	—	260	54.36	228
Empire Day (S. Black)	2	120	44.82	188
Gaika G.M. Co., Ltd.	5 1C	3582	1092.79	4590
Do. (tailings)	—	1601	134.71	566
Globe and Phoenix G.M. Co., Ltd. ...	40 10P	5191	8347.20	35058
Do. (concentrates)	—	252	560.16	2353
Do. (slimes)	—	2977	545.17	2290
Guinea Fowl (Sadler & Holloway) ...	5	140	76.24	320
Do. (tailings)	—	230	5.07	21
Lily (Austen and Ericsen)	2	196	29.69	125
Murray (J. Fischer) (tailings)	—	420	19.92	84
Nevada (C. C. Hendrie)	2	203	32.66	137
New Dunraven G.M. Ltd.	5	640	133.09	559
Do. (tailings)...	--	510	33.37	140
North Bonsor (Cornish Syndicate) ...	15	1183	256.32	1077
Do. (tailings)	—	1085	47.54	200
Pharos (Pharos Synd.)	2	92	25.92	109
Pretty Polly (New Rhod. R. Co. Ltd.	5	472	200.80	885
Do. (tailings)	—	280	54.34	228
Prince George (J. H. Veasey)	5	198	28.11	118
Selukwe Columbia G.M., Ltd.	1C 3P	2180	806.30	3386
Do. (tailings)	—	1436	188.00	790
Do. (slimes)	—	745	92.96	390
Sheba-Bongola (Forbes R. Synd.)	5	380	77.03	324
South Bonsor (Ideal Synd.)	10	438	24.06	101
Tebekwe (Tebekwe Synd.), Dec., 1910	(10)	480	142.99	606
Do. March, 1912	20	1523	252.10	1059
Do. (tailings)	—	1260	33.81	142
Wanderer (Selukwe) G. M., Ltd.. ...	4GR	19200	1846.64	7844
Wild Dog (tailings) (Gilday and O'Connor)	--	300	19.84	83
Gwelo District Total			16,336.73	68,708

MATABELELAND TOTAL ... ... 28,023.34 ozs.
VALUE £117.787

MASHONALAND.

	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
HARTLEY DISTRICT—				
Amaroso (C. H. Wheildon)	5	243	71.22	299
Do. (tailings)	—	170	22.34	94
Battlefields (Minaar & McArthur). ...	2C	1402	355.57	1493
Do. (tailings)	—	1402	172.27	724
Birthday A. (R. J. Bray)	2	60	5.88	25
Blue Rock (Ellsmoor & Goodyer)	2	100	27.67	116
Do. (tailings)	—	247	35.25	148
Brilliant (Mabel's Luck Synd.)	5	360	106.50	447
Do. (tailings)	—	210	64.78	272
Bucks (E. H. Walsh)	2	70	24.53	103
Buller (J. Gunn)	5	380	87.28	366
Do. (tailings)	—	300	96.64	406
Cam & Motor G.M. Co., Ltd. (tailiings)	—	354	229.15	973
Concession and W. Extension (C. E. Simpson)	5 1C2P	2208	630.18	2647
Corsilla, D. (H. W. Roberts)	2	4	2.31	10
Crown No. 2 (Crown Synd.)	2	200	42.76	180
Do. (tailings)	—	190	31.38	132
Dreadnought (W. E. Masters)	1C	797	57.28	241
Eiffel Blue & E. Ext. (Willoughbys Con. Co., Ltd.)	10	1293	503.05	2113
Do. (tailings)	—	810	55.22	232
Giant Mines of Rhodesia, Ltd.	30 2T	11300	4262.23	18079
Glasgow (Glasgow Mines, Ltd.)	5	326	76.45	321
Do. (tailings)	—	280	29.17	123
Glencairn No. 3 (Glenrosa Synd.). ...	4	416	367.61	1544
Do. (tailings)	—	600	60.77	255
Gnu (R. Muirhead)	2	180	43.28	182
Golden Valley (J. Mack)	5	400	128.36	539
Do. (tailings)	—	175	74.16	311

	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
Goldmore (B. Secretan)	2	100	11.81	49
Do. (tailings)	—	100	24.96	105
Goodsman (W. M. James) (tailings) clear up	—	—	3.14	13
Grogram (Feb.) (Union (Mash.) Synd.)	5	293	41.30	173
Do. (tailings)	—	250	4.28	18
Heather pannings (W. A. Guiney)	—	—	1.07	4
Heathfield (D. M. McBarnet)	5	150	32.99	138
Do. (tailings)	—	50	9.46	40
I.X.L. (Heroine G.M. Co., Ltd.)	2	235	42.10	177
Jasper (J. Hardy)	2H	300	64.66	272
Kanyemba (Kanyemba Synd.)	5	400	212.36	892
Do. (tailings)	—	200	47.43	199
Lapwing (J. Davidson)	2	217	114.60	481
Masterpiece G.M. Co., Ltd.	5	710	319.05	1340
Do. (tailings)	—	450	53.97	227
Moliere (H. Moser)	5&H	750	155.14	652
Muscott (Union (Mash.) Synd.)	(5)	81	20.34	85
Oleander G.M. Co., Ltd.	3	11	6.56	27
Do. (tailings)	—	11	11.39	48
Owl (A. Rolfe)	10	852	315.29	1324
Do. (tailings)	—	657	90.59	380
Pickstone, 1E. (S. L. L. Synd.)	4	395	392.09	1647
Do. (tailings)	—	312	79.00	332
Pool (Pool Synd.)	5	97	29.54	121
Progressive E (R. R. Aitkin)	2	103	55.96	235
St. Oliven No. 2 (Yellow Jack Synd.).	2	35	95.42	401
Shepherds (Phoenician Synd.)	7	680	356.50	1497
Do. (tailings)	—	110	183.83	772
Tyne (Kimberley Tyne G.M. Co Ltd.) (February and March)	2C	2755	601.00	2524
Unknown (Brooks & Martin)	2	65	53.11	223
Upsala (Macdonald, Sale, & Schwabe)	(3)	191	89.11	374
Warm (Union (Mash.) Synd.)	5	178	197.78	831
Do. (tailings)	—	140	25.84	108
Warthog (Coad and Tallon) (Feb.)	5	100	29.36	123
Do. (March)	5	150	37.27	157
Do. (tailings)	—	120	21.18	89
Washington (1. J. Minaar)	5	391	442.63	1859
Do. (tailings)	—	350	27.05	114
Whistlecock, 1 W (T. McDowell)	2	120	18.67	78
Do. (tailings)	—	100	24.76	101
Hartley District Total			12,005.88	50,611
LOMAGUNDI DISTRICT—				
Ayrshire (R. E. & D.) (slimes, clean up)	—	—	60.36	253
Broken Hill (Feb. and March (Sceptre Synd.)	1 pn.	831	144.22	606
Eldorado Banket G.M. Co., Ltd.	2C 20	7608	3666.15	15548
Do. (tailings)	—	7556	744.61	3151
Gella (Hudson & Frost)	3	22	38.09	160
Linnett (A. L. R. Morkel)	2	86	34.98	147
Tripolitania (P. Presot)	D	—	17.06	72
Vulcan (Vulcan Syndicate)	2	350	50.83	213
Lomagundi Total			4,756.30	20,157
MAZOE DISTRICT—				
Goth B (Goth Synd.)	2	48	24.50	103
Hay G.M. Co., Ltd.	10 1T	1900	131.35	557
Do. (tailings)	—	1900	541.59	2299
Honest (G. Brown)	3	105	17.32	73
Jumbo G.M. Co., Ltd.	30	3000	599.70	2549
Do. (tailings)	—	2000	302.00	1283
Do. (slimes)	—	1000	132.79	564
Lion and Lion DB (Assd. Mines of Rhodesia, Ltd.)	5	1002	141.59	595
Mickey (B. G. Byerley)	2	94	153.22	643
Night Adder (Night Adder G.M. Syd.)	2	163	29.28	123
Puff Adder (Puff Adder Synd.)	2	153	107.14	450
Umkulu D.B. 1W (Llaksram Synd.).	2	62	51.13	215
Mazoe Total			2,231.61	9,454
SALISBURY DISTRICT—				
Eureka (R. G. F. Warton)	2	180	24.87	104
Mont d'Or (Claxton and Bussell)	2	176	195.72	822
Old Loyalty (Shamva Ilex G.M. Co., Ltd.)	5	400	90.92	382
Do. (tailings)	—	198	19.48	82
Radnor 1 (Jones & Wyllie) Feb. and March)	2	90	90.79	381
Salisbury Total			421.78	1,771
VICTORIA DISTRICT—				
Etna (W. F. Schielke)	5	225	30.15	127
UMTALI DISTRICT—				
Bromley (Umtali Waterfall Synd.) tailings	(10)	170	18.86	79
Do. (tailings)	—	150	12.59	53
Elgin (Umtali Waterfall Synd.)	(10)	103	50.49	212
Do. (tailings)	—	31	9.36	39
Do. (slimes)	—	57	5.92	25
Liverpool (Anderson & Snodgrass)	5	740	60.01	252
Do. (tailings)	—	290	29.70	125
Penhalonga Mines, Ltd.	50	6600	609.24	2585
Do. (Concentrates)	—	126	567.75	2356
Perthshire D.B. (Sussex Synd.)	5	620	136.75	574
Do. (tailings)	—	100	14.34	60
Rezende Mines, Ltd.	35	4130	880.79	3737
Do. (Concentrates)	—	51	207.99	876
Do. (tailings)	—	2380	338.85	1438
Rezende 1 W. A. (Imbeza Synd.)	10	4343	278.78	1183
Do. (concentrates)	—	7	33.50	139
Umtali (Umtali Waterfall Synd.)	10	844	240.81	1011
Do. (tailings)	—	794	107.30	451
Umtali Total			3,603.03	15,195

MASHONALAND TOTAL	23,048.75 ozs.
VALUE	£97,315.
GRAND TOTAL	51,072.09 ozs.
VALUE	£215,102.

SUMMARY.

Gold.—	Ozs.	Value.
Matabeleland	28.023.34	£117,787
Mashonaland	23,048.75	97,315
Total	51,072.09	£215,102
Silver	14,423.19 ozs.	£1,585
Chrome Iron	2,699.20 tons	6,025
Lead	49.71 tons	698
Coal	15,255 ,, (sales)	5,396
TOTAL VALUE MARCH OUTPUT		£228,806

INVESTORS' DIARY.

The following company meetings have been announced:—

May 8.—**Roberts Victor Diamonds.**
May 10.—Ferreira Deep; Ferreira G.M.; Knight Central.
May 17.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep (Extraordinary General Meetings)
May 18.—Aurora West.
May 22.—Apex Mines; New Kleinfontein.
May 23.—Benoni Consolidated; Crown Mines; National Bank (at Pretoria).
May 29.—Robinson G.M. Co.; New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.
May 30.—Village Deep.
June 4.—Ferreira G.M.
June 5.—Rand Mines.
June 7.—General Mining and Finance Corporation.
June 21.—New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.
June 26.—Transvaal Consolidated Lands.
June 28.—A Goerz & Co.
July 19.—Transvaal Consolidated Lands,

CYANIDE of SODIUM, 120 %
ZINC DUST, SHEETS and SHAVINGS.
MABOR FUSION CUPELS and MATERIAL.
3 STAR CRUCIBLES and CRUCIBLE BARS.
3 STAR LITHARGE.
HARDWOOD MINING POLES and SAWING TIMBER.
"BRUNSVIGA" Calculating Machines.

RICHARD HEYMANN & CO.,
73/5, Exploration Buildings
P.O. Box 2425.
Telephone 351.
Telegrams: "Extra."

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Some Suggestions Regarding Miners' Phthisis.

To the Editor, *South African Mining Journal.*

Sir,—This subject being much in evidence just now through the Commission's Report and proposed Government legislation thereon, it may not be out of place for me to offer a suggestion for dust prevention. That I should know something of my subject will be admitted, when I state that I am probably the only man left alive of a small number who ran rock drills (the old Holman, to wit) on the Stanhope Geldenhuis Deep level in 1891, and subsequently at Crown Reef in 1892. Since then I have been continuously connected with Rand mines in practical work (chiefly rock-drilling), and as shift boss and mine captain of some of the largest and most important mines. I have to add that although only 40 years old and originally of robust constitution, my health is now seriously affected by phthisis, and I cannot stand Rand mines any longer, but am trying to prolong what my experience and commonsense tells me can only be a further short term of life, by working in an outside district where rock drills and attendant evils are unknown. I was much interested in your reports of the phthisis discussion at recent meetings of the Metallurgical Society, and it seems to be generally conceded that a number of different but effective methods are now in use for dust allaying during actual drilling, and that the chief remaining difficulty is to overcome the dust raised by blasting. It seems to me that this ought not to offer any great difficulties, and my suggestion is to have a spray in operation at or near to the nearest boxhole to face of stope, in main drives, in the direction of travel of the air current. I am quite confident this method would most effectually prevent any distribution at all of the fine dust, as when in suspension, the dust naturally follows the direction of travel of the air, and on reaching the fine filter curtain, set up by a fine water spray, the dust would be immediately deposited. These sprays need only be put into operation at the time of blasting; by the miner in charge of the working place and as there is a period of, say, three hours, between blasting time and the following shift coming on, any dust set up by blasting would be effectually deposited in that time. The oncoming shift would shut off the sprays. In development faces sprays should be placed at the end of the air pipe and turned on by the miner after lighting his holes. Compressors should be kept going continuously between shifts, and in places where water pressure is low (a frequent fault), the air pipe should be tapped in to the water pipe, to give by air pressure an efficient fine spray. Inexpensive fittings like Britten's atomizer would suit the purpose admirably. A benefit of secondary importance would be the improvement in the general ventilation of the mine, by the cooling of the air at frequent points in its line of travel. I am also of opinion that the best possible use is not made of the many small streams of water cut in development of the mines, as these streams are invariably led back, straight along the drives, to the shaft, and passed down by launders to the pump stations, frequently hundreds of feet. I contend that a much better system from a phthisis point of view is to pass all these streams down through nearest working stopes, level to level, until the pump station level is reached. This method would be effective in many mines in keeping the working stopes in such a damp state that dust would be prevented by its means alone, besides being an economy, especially in mines where the water is very acid, as rails over so many different levels would not want to be so frequently renewed. I should be glad to hear what others interested may think of these suggestions, if you should think them of sufficient interest to insert in your valuable paper. —I am, etc.,

"MONTAGUE STARLING."

Rietvallei G.M. Co.,
P.O. Alkmaar,

Engineering Ethics.

To the Editor, *South African Mining Journal.*

Sir,—The directors of the Jumpers G.M. Co., who are large shareholders in the Benoni Consolidated, rightly called in an independent engineer, namely, Mr. Laurie Hamilton, to report on the Benoni metallurgical muddle, while the directors of the Benoni Company called in Mr. F. L. Bosqui to make a report to them. With reference to proposed amalgamations, it will be noted that the directors have commissioned engineers of the mining houses to report on the proposed amalgamation scheme, and to make valuations of the two properties for the allocation of shares. It is possible that these engineers have more data available to their hands for such a report than engineers in private practice would have, but that is no reason why engineers holding fat billets should be allowed to undertake duties outside of the group on which they are employed. If the mining houses would put a stop to this sort of thing such information on previous amalgamation schemes put through by the different groups might be made available for independent engineers holding a power of attorney for *bona-fide* amalgamation schemes.

It is easy to understand why the Professors of the South African School of Mines are allowed to undertake private practice. They are poorly paid in comparison with the engineers of the mining houses. To say that there are no engineers in private practice capable of reporting on amalgamations is absurd.—Yours, etc.,

"LIVE AND LET LIVE."

1st May, 1912.

Rand Geology.

To the Editor, *South African Mining Journal.*

Sir,—I was glad to see in Dr. Mellor's last reply to Mr. Bleloch's stratigraphical geology, that he approves of using "street lines" as a basis of plotting the various series of reefs underlying Main Reef series, as it is a plan I have adopted from the beginning, and, by this time, every Johannesburger who reads your estimable journal must be aware that when he is crossing from Commissioner Street to President Street he is traversing the Blue Sky or East Rand series; from Pritchard Street to Bree Street the Van Ryn series—alias Langerman's Kop; and so on north over the other series until he gets to the Gaol—better known as the Fort—where, in the yard, he can study the geology of the Hospital Hill shales, as many a poor fellow has had to, *nolens volens.* Pedestrians crossing the Wanderer's ground, just before coming to *my* Government Reef series, about in line with Wolmarans Street, must "mind the step," as there is a nasty longitudinal fault there, and an overtilted upthrow as well. I would not be surprised if one day some geologist does not discover a subcutaneous diabase dyke, as there is every indication of it, but it is no good theorising on such dry matters, as there is so much yet to be done for the Rand from an economic standpoint.—I am, etc.,

SCOTT ALEXANDER.
"Rand Stratigraphist."

Johannesburg,
April 30th, 1912.

RANDFONTEIN AND E.R.P.M. PROFITS.

Prominent Features in the Chamber of Mines' Analysis—East Rand and Randfontein —Reserves Extinguished by the Eckstein Group.

THE outstanding features of the March returns are the unusually high profits at the East Rand Proprietary Mines and the remarkable falling off in the profits of the Randfontein Central. While on the extreme east we find signs of recuperative power to a degree which would have been almost incredible if foreshadowed a few months ago, on the extreme west there are indications of a falling-off which, although equally striking, are perhaps not altogether surprising to those who have studied the affairs of Randfontein for some time past. They are not such as were anticipated in the Chairman's speech at the last annual meeting, but there have been great changes in the personnel of the company since that date, and until such time as further information is vouchsafed, it would be unfair to attempt to draw conclusions. The East Rand phenomena has already been dealt with in these columns. After attention had been drawn to the fact that profits were mounting at an unexpected rate, we received an authoritative assurance to the effect that they were sufficiently and adequately explained by the closer system of mining which had been adopted. The explanation of the Central Randfontein occurrence is still to be made. The position will be made clear by the following table:—

	Tons.	Revenue. per ton.	Expenses. per ton.	Profit.	
September ...	201,998	23/10	16/ 4	£76,000	7/ 6
October	212,510	24/-	16/ 6	80,000	7/ 6
November ...	201,534	24/-	16/ 6	77,000	7/ 6
December ...	208,005	21/ 1	17/-	74,000	7/ 1
January	215,556	24/ 3	17/ 5	74,000	6/10
February ...	211,443	23/ 6	17/ 4	65,000	6/ 2
March	229,642	22/ 5	17/10	53,000	4/ 7

In a word, the February profit of the Amalgamated Randfontein Producing Companies is not very much more than that obtained by the southern portion alone, before the 600-stamp mill was erected on the northern area. Indeed, with 400 stamps in 1910 an average profit of nearly £45,000 was made, as against a profit of £53,000 with 805 stamps in March, 1912. The average costs at South Randfontein for 1910, the year before the fusion, were 18s. 2d., and the average recovery 27s. 5d., the profit working out at 9s. 2d. per ton milled. It has been said by those who may be presumed to know something about the matter that the southern section has been contributing some £50,000 per month, or near it, to the monthly profits ever since the amalgamation; and the obvious conclusion, therefore, is that the northern section, with its costly and magnificent plant, has contributed practically nothing. It is impossible to say how far this statement is correct, but, in any event, it seems that the burden of profit-making has been largely on the older productive area. Sorting has not been extensively carried out at Randfontein for some months, and last year, as Mr. J. W. S. Langerman explained at the last annual meeting:—"Owing to shortage of natives, it has only been possible to sort out 5·61 per cent., and the grade of ore milled has suffered in consequence." The question now is, how far the necessity of keeping up the grade in the face of huge tonnages, the average development in the northern section, and little sorting to speak of is responsible for the decided falling off month by month which is indicated in the tabular statement shown above?

Among comparatively minor events worthy of being referred to is the greatly increased crushing at the Robinson Deep during the month of March, the quantity milled being 55,500 tons, as against 17,000 and less per month for several months previously. In fact, we believe it is an easy crushing record for the mine. Working profit per ton milled was lower than usual, but the total monthly profit advanced from £35,038, as in February, to £45,499. The five tube-mills of the new plant will be in running order next week, and the old series will be dismantled shortly afterwards in order to complete the reconditioning scheme. The Village Main Reef profit of 14s. 10d. per ton milled is to be compared with that of 18s. 2d. in February and 21s. 1d. in January. The Village Deep, on the other hand, shows a revenue of £78,061, as against £71,689 in February, and a profit of £25,725, as against an average of about £22,000 for the previous six months. The Heriot profit has fallen from 18s. 1d. to 15s. 7d. Modderfontein B. profit, on the other hand, has increased from 14s. 7d. to 18s. 10d. over the month, New Modderfontein showing a reverse movement from 15s. 2d. to 13s. 9d. The Meyer and Charlton profit for March was £17,094, a considerable advance upon previous figures, that for September, for instance, being £10,501. Geldenhuis Deep shows a fall to 3s. 8d. from 6s. in February, and Crown Mines a similar movement from 14s. 6d. to 13s. 2d. City Deep continues to show satisfactory progress. The Cinderella Consolidated, it is gratifying to find, has a profit of £5,027, a higher figure than it has attained previously. The profits in February were £102. A total sum of £231,935 from gold reserves thus extinguished has been added to the profits of the various Eckstein and Rand Mines Companies, and the abrupt variations in profit remarked upon in connection with these companies may doubtless be explained by the fact that profits have been subject to no adjustment by means of reserve gold, as formerly.

De Beers Consolidated Mines

By a circular which the De Beers Company are issuing simultaneously with their dividend warrants to the shareholders as at March 31 last, the board notifies shareholders that it has resolved to revert as from the end of the current financial year to a declaration of dividends on the deferred shares in December and June instead of September and March, as at present; but in order to cause the shareholders as little inconvenience as possible in consequence of this change, the directors announce that they intend to declare a dividend in respect of the quarter ending September 30, 1912, and another in December, 1912; and thereafter declare half-yearly dividends.

In another circular issued to the deferred shareholders the company notifies that it has been represented to it by the holders of registered deferred shares and by jobbers as well as brokers dealing in the company's shares that the fact of there now being a large preponderance of share warrants to bearer over registered shares, greatly hampers transactions in the latter, which at present are the only ones admitted to delivery on the London Stock Exchange, whilst on the Paris Bourse only bearer shares are negotiable. The board consequently has decided to instruct outstanding registered holders of deferred shares to convert them into share warrants to bearer, and is prepared to make no charge for the conversion to all deferred shareholders, who will deposit their certificates at the head office in Kimberley or at the London transfer office, 15 St. Swithin's Lane, before June 30 next. It is pointed out in the circular that the holders of share warrants to bearer receive their dividends considerably earlier than the registered ones in consequence of the necessity of agreeing the principal register kept in Kimberley with the branch register kept in London.

Ebenezer Diamond Mine.

Active mining operations are being started immediately at the Ebenezer Diamond Mine (close to the Koffyfontein Mine), under the managership of Captain A. F. Brown.

MINING MEN AND MATTERS.

Messrs. W. Allen and Francis Drake, members of the Institution of Mining and Metallurgy, have left England for Rhodesia.

* * * *

Mr. J. F. Hawkins, of the General Mining and Finance Corporation, has been appointed business manager of the New Goch Mine.

* * * *

Mr. C. B. Saner is temporarily acting as manager of the Glynn's Lydenburg, Ltd. It is feared that Mr. Damant will be unable to resume his duties for some considerable time.

* * * *

Recent changes at Randfontein Central are as follows:—The management of Nos. 9, 10 and East Reef sections has been taken over by Mr. B. C. Gullachsen. The mine captains for the respective shafts are: No. 9, Mr. McMurtrie; No. 10, Mr. Johns; East Reef, Mr. Bebb. Mr. McMurtrie is being moved from No. 8, where he was mine captain, as stated in our last issue.

* * * *

The following gentlemen have been elected Members of Council of the Institution of Mining and Metallurgy for the current year:—Messrs. R. Gilman Brown, T. C. Cloud, R. E. Commans, Arthur Dickinson, W. R. Feldtmann, J. A. L. Henderson, Alexander Hill, George T. Holloway, F. W. Harbord, Sir Thomas H. Holland, Edmund William Janson, Edward T. McCarthy, Frank Merricks, Humphrey M. Morgans, Arthur L. Pearse, Arthur E. Pettit, R. A. S. Redmayne, A. L. Simon, S. J. Speak, Henry Claud Taylor, W. F. A. Thomæ, S. J. Truscott, Stephen Vivian, and W. Fischer Wilkinson.

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The following is a list of the certificates issued by the Mines Department during the year ending December 31, 1911:—Mine Managers' Certificates—Metalliferous.—First Class: W. G. Adamson, F. Ardington, H. E. Barrett, C. L. Butlin, A. A. Coaton, C. T. Cogle, E. M. de Chazel, L. E. de Villiers, H. Dodd, D. B. Donovan, W. J. N. Dunachie, R. L. Edmiston, H. N. Fuller, B. G. Gullachsen, A. R. Hulton, Wm. Jones, C. J. N. Jourdan, D. Levey, S. H. Lewis, H. T. Packard, D. W. Perkin, J. Ritchie, R. W. Robinson, G. H. Smith, P. G. Thiel, F. A. Unger, H. L. van Eyssen, Wm. Whyte. Service: E. A. Collins, C. F. Lange, F. J. Trump, J. H. Twiddy. Second Class: J. Berry, H. E. G. Stephens. Coal: W. J. N. Dunnachie, B. C. Gullachsen, S. B. N. Hill, M. J. Thomas. Service: J. C. Jeffrey, J. Smart. Mine Surveyors' Certificates.—F. A. Ashe, A. J. Auret, A. E. Baker, F. B. Ballenden, A. F. Bovell, E. E. Carter, G. J. V. Clarence, W. G. P. Cobbett, E. P. Cowles, K. Forster, P. O'B. Frost, R. A. Hunter, C. N. Hutchons, J. Innes, A. L. James, W. H. Johnston, E. H. A. Joseph, H. G. Kay, A. S. Lejeune, C. Lipschitz, H. G. S. Loxton, H. A. J. McLellan, R. Meyer, H. A. Mills, R. R. Mitchell, N. H. Monro, W. S. New, G. O. Paterson, G. S. Paterson (honours), F. G. Peckham, F. I. Phillips, W. A. Quince, W. H. Raine, W. Reid, P. A. Rogers, J. Ritchie (honours), W. Rowe, W. W. Sealey, G. D. Stephen, A. Stuart, R. Surtees, H. F. S. Turner, A. Thorburn, A. W. Watson, Wm. Whyte. Service: P. Moorshead, J. N. H. Watermeyer. Mechanical Engineers' Certificates: A. H. Chambers, F. Cordiner, D. M. Dall, H. E. du Sautoy, S. E. T. Ewing, H. W. C. Gittens, D. Hubbard, E. G. C. Jones, M. MacFadyen, T. Maddren, C. Miles, S. S. Phythian, W. Reid, J. H. Ritchie, G. Rodgers, G. Sahleartz, A. B. Smith, G. M. Stirling, J. E. Stone. Mine Overseers' Certificates—Metalliferous: W. Arnison, J. B. Barnes, J. H. Beatty, R. Beaumont, A. E. Bebb, J. Bell, W. Berthelson, W. Beuster, F. L. C. Biccard, C. Y. Bruce, O. W. Bushell, R. R. Came, F. C. Carbis, A. H. Corbett, G. I. Cree, T. J. Crosse, R. G. S. Dale, E. F. A. de Kock, S. de Smidt, P. Diamond, G. J. du Plessis, F. G. Dunning, J. Fairhurst, D. M. Fergusson, G. F. L. Ferguson, E. B. Fothergill, W. C. W. George, J. H. Gilleland, T. H. Harris, J. Harvey, W. R. Hayes, G. High, T. H. Hodge, A. G. Hoyer, A. Johnsen, J. A. Lanyon, J. A. Liljestrom, C. Lipschitz, G. A. Macneillie, S. J. E. Massey, E. McC. Martin, W. McKenna, J. W. McNicol, J. McD. McPhee, J. G. Midgley, J. Moore, J. P. Mullen, A. Ornstein, J. W. Pearce, S. Polglase, J. Pope, A. J. L. Pretorius, J. D. Pretorius, A. Ramsay, J. Reay, T. T. Retief, J. Richardson, A. Robinson, W. J. Rolfe, E. J. Rowe, B. Schlesinger, M. M. Sinclair, J. Smart, A. Smith, J. C. Stewart, E. G. Sudlow, W. H. Thompson, F. Tindale, M. Trewick, B. Warren, C. M. Whitehead, A. Whitford, W. J. Williams, G. A. Williamson, G. Wilson. Coal: J. B. Barnes, J. Finnie, D. Griffiths, E. McC. Martin, G. Wilson. Coal Service Certificate.—J. Smart. Engine Drivers' Certificates.—Winding: F. Adamson, B. W. Allan, F. A. Alford, W. J. Beedle, J. Bennett, G. Bentley, R. Blain, A. G. Blumfield, T. Bright, G. C. Brink, W. Brock, R. Brown, J. Campbell, O. G. Clark, T. Currie, H. Davis, W. Drew, J. G. Duncan, C. Fraser, J. J. Fisher, R. Hall, V. L. Harris, J. Hayes, A. J. Head, W. J. Holloway, R. T. Jardine, F. Kennedy, A. W. Kermath, F. Lewis, R. W. Maddock, H. Martel, J. McCue, J. McDowall, A. E. Middelton, E. J. Moyle, R. Paxton, J. M. Prinsloo, S. Raven, W. Reid, A. Rowe, H. Shorten, J. B. Simpson, W. C. Smith, A. J. Stain, H. A. Steele, W. T. Thomas, W. Thomas, G. H. Wadely, T. Ward, J. Weir, R. W. Young. Service: C. Southern. Locomotive: J. W. Akeroyd, A. J. Allen, G. Baird, D. Bayne, J. J. Benjamin, T. Bryant, F. W. Clow, R. Coats, D. Douglas, F. W. Dunn, J. J. Foley, W. Frame, E. L. Griffiths, C. T. Hill, E. S. Lidstone, H. Leach, H. C. Martin, J. E. Messenger, R. More, R. Morrison, W. E. Morton, A. S. Moss, R. Nickson, S. H. Pope, H. Proctor, D. Quin, J. G. Rank, G. Reynolds, A. Rudd, P. J. Theron, W. H. Thompson, R. S. Trevorrow, C. Wrede. Electric Locomotive: T. Belshaw, A. Hewer, W. H. Morant, L. Palmer, J. Phillips, W. G. Philpott, W. Robertson, C. M. Vincent.

Manicaland Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of March was as follows:—Reef.—Mill: Gold won (fine gold), 173 ozs. 17 dwts. 19 grs.; tons crushed, 1,176; value, £730 5s. 6d. Cyanide.—Gold recovered (fine gold), 17 ozs. 16 dwts. 14 grs.; tons treated, 480; value, £74 17s. 7d.

City and Suburban.

During the March quarter the City and Suburban Mine milled 79,731 tons for a recovery of 34,390 ozs., equal to 8.621 dwts, per ton. At March 31 the gold reserve was 6,329 ozs., valued at £26,412. Working expenses amounted to 21s. 7.468d. per ton; accumulation treatment expenses to 1.977d. per ton; total, 21s. 9.445d. per ton. Working profit equalled 14s. 2.722d. per ton, and gold reserve 6s. 7.45d. per ton. Reef disclosures for the quarter totalled 1,157 feet, and averaged 8.7 dwts. over 27 inches. The capital expenditure for the quarter amounted to £601 15s. It has been decided to discontinue the carrying of reserve gold, and the amount in reserve at the end of February has been declared with the results for March as a special item. In future the actual results will be declared.

Natal Gold Mines.

The new Natal Gold Mines, better known as the Phœnix, has risen from its ashes, says the *Times of Natal*. The old workings are now being opened and put in order, and an up-to-date cyanide plant will shortly be erected. There are about 1,000 tons of fairly rich old tailings awaiting treatment by the new plant, and good results from this source are confidently anticipated. The Phœnix Mine has quite a history, with nothing to its disparagement. Some 28 years ago the Natal Government offered a large sum of money as a reward to the first payable gold mine discovered in Natal, and the mine, in those days the Phœnix, won the reward. The trial crushing that took place in Maritzburg, under Government supervision, resulted in a yield of over 22 dwts. per ton.

Jupiter G.M. Co.

The directors' report for the quarter ended 31st March, 1912, gives the following summary of operations for the quarter ended 31st March, 1912:—Mine: Number of feet driven, sunk and risen, 2,237½ feet; ore crushed, 106,200 tons; less developed, estimated at about 19,054 tons (the quarterly estimate of tonnage should not be expected to include all ore fully and partially developed during the period, as blocks of ground may be held over pending fuller information); excess crushed during period, 87,146 tons. Mill and tube mills:—During January an average of 75 stamps ran 28 days, 23 hours, 28 minutes; during February an average of 80 stamps ran 27 days, 8 hours, 15 minutes; during March an average of 105 stamps ran 28 days, 22 hours, 35 minutes; total running time, 85 days, 6 hours, 18 minutes. Tons crushed, 106,200 tons; tons crushed per stamp per 24 hours, average 14.352 tons; yield in fine gold, 14,154.503 ozs.; yield per ton crushed in fine gold, 2.666 dwts. Sands Works:—Sands treated (equal to 43.83 per cent. of tonnage milled), 46.544 tons; yield in fine gold, 6,586.411 ozs.; yield per ton treated in fine gold, 2.830 dwts.; yield per ton crushed in fine gold, 1,240 dwts. Slimes Works:—Slimes treated, 59,656 tons; yield in fine gold, 4,708.047 ozs.; yield per ton treated in fine gold, 1.578 dwts.; yield per ton crushed in fine gold, 0.887 dwts. Total yield:—Total yield in fine gold from all sources, 25.448.961 ozs.; total yield per ton crushed in fine gold, 4.793 dwts. General remarks:—The amount spent on capital account during the quarter ended under review was:—On plant, buildings, etc., £7,194 5s. 7d.; on shaft sinking, £6,638 19s. 1d.; and on development, £8,458 15s. 6d. Note:—A credit to development of £9,786 5s. 6d., for redemption of development, has been charged to working costs as above. Reserve gold:—At 31st March, 1912, there was gold in reserve of 675 ozs.

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Engineering Notes and News.

The Simplon Railway Locos.

In Mr. Williams-Ellis's paper on "Cascade Multi-Speed Motors," read before the South African Institute of Engineers on April 20, mention is made of the Simplon railway locos, the traction motors of which operate in "cascade" or "concatenation." The following information may be of still further interest to many: There are two types of electric locomotives in use on the above railway, supplied from an overhead line with three-phase current at 3,000 volts; these are specially noteworthy in their arrangements for the regulation of speed. In the older locomotives, such as are in use on the Burgdorf-Thun line, the regulation is effected by mechanical means, whereas in the Simplon engines electrical means are used. One type is arranged for two speeds of 21·7 miles, 43·4 miles per hour; at the former speed each of the two motors develops 400 h.p., and the tractive effort is 12,760 lbs., and at the latter speed each motor develops 550 h.p. and the tractive effort is 8,800 lbs. The second type is arranged for four speeds, 16·12, 21·7, 32·86 and 43·4 miles per hour. At the lowest speed each motor develops 550 h.p. and at the highest speed 850 h.p., while the tractive effort in the former case is 25,300 lbs., and in the latter case 14,080 lbs.

The Patents Report, 1911.

The twenty-ninth annual report of the Comptroller-General of Patents, Designs and Trade Marks, Great Britain, shows a decrease of 4·2 per cent. (from 39,873 to 38,186), in the total number of specifications received during 1911, as compared with 1910. The number of applications accompanied by provisional specifications decreased 6 per cent., while those accompanied by complete specifications increased 2·2 per cent. and reached the record total of 9,829. The number of applications from persons residing in the United Kingdom decreased approximately 6·5 per cent., while the number granted to residents in most foreign countries showed increases, with the exception of the U.S.A. (decrease 5·25 per cent.). A total of 16,452 patents have been granted on 30,603 applications received in 1909, and among 16,269 patents granted in the United Kingdom in 1910, 42·5 per cent. were to persons non-resident on British soil. Corresponding percentages are: U.S.A., 10·5 per cent.; Germany, 30·6 per cent.; France, 53·9 per cent.; Switzerland, 58 per cent.; Austria, 66·6 per cent. The subjects of the applications continue to form a reliable index to the progress of industry and its conditions, but events of temporary interest give rise to abnormal numbers of more or less relevant patents; thus the Hawes Junction and Pontypridd disasters led to numerous applications covering automatic railway signalling devices. The ever-increasing importance of means of locomotion, and apparatus auxiliary thereto, is demonstrated by the high percentage of applications filed *re* road wheels, variable-speed gearing, clutches, and so on. Naturally, internal combustion engines have claimed much attention from inventors.

The works of the Power-Gas Corporation, Ltd., Stockton-on-Tees, are fully occupied at the present time, and the following is a list of the most important contracts recently secured by them:—4,500 k.w. "Mond" bye-product gas plant for Japan; 4,500 h.p. "Mond" bye-product plant for Australia; "Mond" bye-product gas plant (capacity 69 tons of breeze per day), for steel melting; "Mond" coke breeze gas plant (capacity 15 tons of breeze per day) for retort heating; "Mond" bye-product gas producers (capacity 46 tons per day) for cement works; 1,500 h.p. "Mond" bye-product gas plant for Spain; 2,000 h.p. "Mond" bye-product gas plant for electric generating station; 2,000 k.w. "Mond" bye-product gas plant for electrolitic chemical works; 500 h.p. "Mond" power gas plant for South America; "Mond" coke breeze gas plant (capacity 40 tons per day), for brick burning; 6,000 h.p. "Mond" bye-product gas plant, extension to the South Staffordshire Mond Gas Co.'s gas distributing station at Dudley Port. In addition to the above, many smaller plants to use bituminous coal, anthracite, coke, charcoal and sawmill wood waste for power purposes, are on order.

The following tenders were accepted by the Union Government for public buildings during the month of March, amounting to £81,550 11s. 8d.:—Erection of a bridge over the Crocodile River River at Mulders Drift, Krugersdorp District, Transvaal—Messrs. Proudfoot & Co., P.O. Box 2569, Johannesburg; additions to College School, Pietermaritzburg, Natal.—Messrs. Peattie & Stannard, 180, Church St., Pietermaritzburg; repairs to various Government buildings, Mafeking, Cape Province—Mr. W. T. Thomson; erection of Indian quarters at Experimental Farm, Cedara, Natal—Mr. A. C. Bell, Pietermaritzburg; erection of Alexandra Hospital, Maitland, Cape Province—Messrs. F. B. Smith & Co., Brookfield, Breda Street Capetown; alterations, additions, and drainage at Magistrate's Court, Johannesburg—Messrs. R. Forbes & Co., Box 5188, Johannesburg; erection of cells at police barracks, Jagersfontein, Orange Free State—Mr. J. D. Wall, Fauresmith, Orange Free State; layout of new water supply at the Asylum, Grahamstown, Cape Province—Mr. H. Ward, Baird Street, Uitenhage; additions to Central Gaol, Bloemfontein, Orange Free State—Messrs. Hall & Co., Box 92, Bloemfontein; erection of charge attendant's quarat the Asylum, Fort Beaufort, Cape Province—Mr. J. G. Kinnell, Fort Beaufort; erection of school and quarters, Rhenostershoek No. 264, Rustenburg District, Transvaal—Mr. Karl Heyne, Rustenburg; erection of school and quarters, Haaskraal No. 173 Potchefstroom District, Transvaal—Messrs. Bracher & Andrew, Box 12, Potchefstroom; erection of school and quarters, Klippan No. 268, Klerksdorp District, Transvaal—Mr. G. F. Warren, Box 234, Potchefstroom; erection of superstructure for Schulpspruit Bridge, Amersfoort, Transvaal—Messrs. Wm. Bain & Co., Box 2724, Johannesburg.

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THE KIMBERLEY SYSTEM OF ROCK HANDLING.

How Large Quantities of Ground May be Dealt with in the Minimum of Time, with Notes Regarding the Life of Wire Ropes.

The Author's reply to the discussion on the paper read by Mr. Alpheus F. Williams, before the South African Institute of Engineers, was as follows:—The writer must apologise for not replying sooner to those members of the Institution who so ably criticised his paper on "The Kimberley System of Handling Large Quantities of Ground in the Minimum of Time, with Notes Regarding the Life of Wire Ropes." The delay has been caused chiefly through pressure of other work. Mr. Ostreicher criticises the velocity and acceleration diagrams and takes exception to the term "Factor of Safety," and the author admits the justice of his remarks. He also asks for the formula for stress due to bending of ropes round pulleys. With reference to the diagrams it may be well to explain that they were plotted primarily with the object of determining with a fair amount of accuracy the greatest acceleration during the trip and also the highest velocity. The author realised that the usual factor of safety for ropes—here he uses the term as popularly understood—where only dead loads are taken into account, does not give the correct ratio of breaking load to applied load, and when larger skips were introduced in the mines he was anxious to determine how much of the applied load was due to acceleration forces. The author expected some criticism on the term "Factor of Safety," and that is why it is printed in inverted commas in the paper. He agrees that a higher factor of safety does not necessarily mean a higher degree of safety, and his experiments on higher tension steel ropes would appear to prove this to some extent. The author had no intention of implying that the method of measuring the velocity of the rope by the engine was absolutely exact, but measuring the rope velocity at any other place would probably be just as inaccurate. It resolves itself into the question: "What is the velocity of an elastic rope carrying a suspended weight and subject to fluctuating hoisting effects?" The formula used in determining stress due to bending is the well-known Sederholm formula. In reply to Mr. Cook, the author would say that the use of tapered ropes has not been considered. Mr. Tregaskis asks for the factor of safety at which ropes are condemned. As a rule ropes at Kimberley are condemned when they show an excessive number of broken strands, and not as a result of any test to determine the factor of safety. Recently a rope failed and yet the result of a test on a portion of the rope indicated that it was practically as good as when it was first put on. The results of experiments on higher tensile steel ropes are submitted herewith. Mr. Schmitt asks for details of buffer beams and a drawing is herewith attached. The author regrets that in the original paper the reduced size of Plate 2 did not show these more clearly. The skips at Kimberley are retained in position by gravity only and are in no way fastened to the bridle. The shaft guides show but little wear, only in one or two exceptional cases has it been necessary to renew a few. The author cannot say that there is any marked difference in the life of ropes between those used on the Whiting hoist and others used on drum hoists. The number of loads hoisted, taken in conjunction with the distance hauled would indicate that there is not much difference either way. The cost per load for 100 feet in use as indicated in the tables works out practically the same in both cases. Mr. Vaughan disagrees with the remarks regarding the creep of the rope on the drum, but the author is of opinion that this does occur. On all of the Kimberley drum hoists which have plain smooth drums the tendency is for the rope to wear the drum into a spiral, in some cases the depth of the groove worn is almost one-eighth of an inch. The rope cannot wear the drum away in this manner without at the same time wearing itself. As to whether there is slip and wear between the rope and the headgear sheave, the author has made experiments to determine the co-efficient of friction between the rope and the sheave. This experiment was made primarily to determine the driving effect of the Kimberley Mine Whiting engine, where the rings of the sheaves on the crankshaft are tightened hard to prevent them from slipping, and where the rings in the idler pulley are left loose and act simply as guide pulleys. The experiments give definite ratios between tight and slack side of the rope when slipping takes place, and also gives a uniform co-efficient of friction between rope and pulley. Knowing these particulars and also the inertia of the headgear sheave, etc., it is a simple calculation to prove whether or not it is possible for the rope to slip under the acceleration conditions which prevail in ordinary practice. Buffer beams in the shaft have been found to be the only practical way of satisfactorily enabling the large quantities of ground to be handled. In reference to Mr. Calder's remark *re* loading trucks at shovel speed, the writer in explaining the system adopted in Kimberley took for granted that if the system was to be a success it was certainly impossible to fill trucks at shovel speed on the main tramming levels. In reply to Mr. Laschinger, the author would say that he does not attach importance to violent acceleration and retardation effects as indicated by diagrams, and for the reasons already given, namely, the limitation of the instrument, he does not think a complete interpreted record for the whole trip would give any more satisfactory information than is to be obtained from the diagrams as they stand. The following brief description will indicate how the hoisting of ropes are changed in the case of a cylindrical drum hoist. At each shaft an auxiliary hoisting engine or winch is installed of sufficient power to lift any of the ropes hanging in the shaft. One skip is lowered on to the buffers at the bottom, the other being at the top. The tail rope is then unshackled from both, the top end being clamped to prevent it falling down the shaft, the bottom end being lashed to the buffers, and the tension frame being hung by tackle. The top skip is independently suspended, its rope detached, and the bottom skip raised to the surface. It is there also independently suspended and its rope detached. When the second skip is being raised, the rope of the first is being unwound from the drum. After the second skip is suspended at the collar of the shaft and the rope unshackled, the winding engine is free to manipulate the old ropes off and wind the new ones on. The new ropes are then both wound on to the drum. The skip which was raised from the bottom then has its rope connected, is lowered and the whole process reversed. The auxiliary hoist is used to facilitate the operations. In case of the Whiting hoist the top skip at the same time rests on the buffers. The hoisting rope is then detached from both skips. The auxiliary hoist and the winding engine are then run in unison so as to lift the free hanging rope to the surface, and at the same time the rope is being wound on to the drum of the auxiliary hoist. When the end from the bottom skip reaches the collar of the shaft a Manilla pilot rope is fastened to it. The remainder of the hoisting rope is then wound completely on to the drum of its auxiliary hoist and the attached pilot rope, during the latter part of the process, takes its place over headgear sheave, Whiting sheaves, etc. The drum of the auxiliary hoist is of sufficient capacity to carry two ropes. A new rope has previously been wound from its reel on to one half of the drum and its end lashed during the winding of the discarded rope on to its half. The end of the pilot rope is now transferred to the new hoisting rope on the auxiliary hoist and the whole process reversed. A bridle and weight are attached to the free end of the old rope when it is being raised in the shaft and to the end of the new rope when it is being lowered so as to avoid danger of the rope catching the timbers. For changing tail ropes, the top skip is lifted to the tipping level, and the bottom skip rests on the buffer beams. The tension frame is hung by tackle and both ends of the tail rope detached from the skips, the top end having previously been attached to a pilot rope from the auxiliary hoist. The auxiliary engine then hoists the old tail rope to the surface, and in a reverse manner the new fail rope is lowered. The cost of tramming depends on the distances the ore has to be trammed. In Dutoitspan Mine the contract price for loading and tramming is 2.64d. per truck of 16 cubic feet; of this about 1d. is the tramming charge. This is equal to about 2.32d. per ton per mile. The original table of comparison between electric loco and rope haulage showed the native labour to be higher in the former case, but unfortunately through an oversight it was not noticed that the figures chosen were for two months where unusual expense had been incurred under this head for the electric loco haulage. Generally the electric loco haulage requires far less native labour than the rope haulage. Mr. Roger Price describes exactly the writers feeling and what the writer understood to be the feeling of the majority of the members of the Institution. Mr. Price said as follows:—"The writer desired here to say that he for one did not understand Mr. Williams to advocate the adoption on the Rand of the Kimberley system in its entirety, and is of opinion that the author's necessary brief remarks under this head indicated clearly that he is perfectly aware of the enormous difficulties which would beset any such attempt." Mr. Roger Price gives some most interesting information and drawings as to what is done at the Rand Collieries. Neither radial baffle doors nor finger doors have been tried in the underground loading chutes, the reason being that the present door works most satisfactorily and is giving little or no trouble. Mr. Price refers to a small lip door at the bottom of the shaft loading box as used at the Rand Collieries. In the equipment of the new loading station on the 3,520 feet level, Kimberley Mine, the writer has adopted this system and has been able to greatly decrease the amount of spillage. Since the publication of this paper the writer has installed pneumatic devices for opening doors of the main chutes underground. By this system the speed of operating the doors has considerably increased, and the amount of manual labour decreased.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

THE WEEK IN THE SHAREMARKET.

An Improved Opening—Ending Firm but Quiet—Zaaiplaats Strong.

QUITE a spurt of activity ushered in the week, and though not maintained, it served to show the latent possibilities of the market. Towards the close the tone is firm, with no great amount of business doing. The speeches made at the meetings of the Consolidated Mines Selection and Albu subsidiaries were most favourably received, and will, no doubt, have an excellent effect in London. Sir George Albu is fond of describing himself as an optimist, but he is also a vigorous thinker, and his views on the position of the mines of his group will be found most clear and informing. The dividend outlook for next month is steadily improving. The feature of the week is Zaaiplaats, which were in demand on good news from the mine. Diamonds remain quiet.

	Friday, 26th	Sat., 27th.	Monday, 29th.	Tuesday, 30th.	Wed., 1st.	Thurs. 2nd.
African Farms	16 6S	16 9S	17 6	17 9B	17 9	18 0
Adair-Usher Process	1 6S	7 6S	...	...	1 6S	1 3S
Apex Mines	41 0B	40 6S	41 0B	40 6B	40 6S	39 6B
Bantjes Consolidated	24 3S	24 3	24 6B	24 6	24 6B	24 9
Benonis	6 9S	6 10S	6 9S	6 11S	6 6S	6 6B
Bushveld Tins	1 3S	1 0B	...	1 1B	1 1S	1 0B
Brakpan Mines	65 0B	66 0B	66 0B	67 6	67 6S	66 0B
City and Suburban	50 9B	52 0	52 0	51 9B	51 9B	52 0
City Deeps	59 0	...	59 0B	59 0B	...	59 6S
Cloverfield Mines	5 9	6 0S	5 9	6 9	6 9	6 11
Cons. Langlaagtes	22 6	23 9S	23 6	23 6	23 0	23 6B
Cons. Main Reefs	20 3	20 3	20 0B	20 0B	20 3B	20 6
Cinderella Cons.	...	24 6B	...	24 6B	25 0	25 3
Coronation Freeholds	0 7S	0 7B	0 7	0 7S	0 7B	0 7B
Con. Investment	22 6B	22 6B	22 6B	22 3B	22 6B	22 6B
Concrete Cons.	10 0B	10 0B	10 6S	10 0B	12 0S	10 0B
Crown Diamonds	5 0S	5 0S	...	...	...	5 0S
Clydesdales	...	10 0B	10 0S	10 0B	11 0S	11 0S
East Rand Cent.	8 6	8 3B	8 4B	8 9	8 9B	9 0B
East Rand Coals	2 5B	2 6B	2 6S	2 5S	2 5B	2 8
East Rand Deeps	2 7B	2 8B	2 8B	3 0S	3 0B	3 1S
East Rand Props.	66 0B	66 9B	66 6B	66 0	66 0B	66 0B
East Rand Deb	£94	£95	...	£94	£94	£94½
Eastern Gold Mines	2 0B	2 6	..	2 1	2 0B	...
Govt. Areas	25 9B	26 6B	27 0	27 6	27 3B	27 9
Glencoe (Natal) Colls	6 3B	...	..	6 0B	...	6 6B
Glynn's Lydenburgs	...	28 0B	30 0S	30 0S	30 0S	29 0S
Glencairns	5 0B	5 0S	5 0B	5 0S	5 0S	4 0B
Ginsbergs	..	28 0B	...	31 0S	...	28 0B
General Minings	...	...	-	...	22 0S	22 0B
Jumpers	–	11 6B	13 6S	–	10 6B	...
Jupiters	13 6	13 6	14 0	14 0	14 0	14 0B
Kaalfontein Diamonds	0 8B	...	0 9	0 6B	0 8B	0 8S
Klerksdorp Props.	3 4B	3 3B	3 4B	3 4B	3 5S	3 7B
Knight Central	14 6B	14 6B	15 0S	15 3B	15 0S	15 6B
Lace Props.	3 3S	3 3B	3 3B	3 5	3 4B	3 4B
Lydenburg Gold Farms	9 1	9 0B	9 1B	9 2	9 1	9 1B
Luipaardsvlei Estates	8 6B	8 0B	...	8 6B	8 3B	8 3
Main Reef Wests	28 6S	28 3	28 6	29 0	28 9B	29 0B
M.R. West Deben.	£98	£98	£98	£98	£100	£100
Modder B's	56 3B	56 3B	56 3B	57 0B	57 3B	56 9B
Midas Deeps	1 0S	0 7B	0 9S	0 7B	0 7B	0 7B
Middelvlei Estates	2 0B	2 0B	2 0B	2 0B	2 3S	2 0B
Modder Deeps	30 0B	32 0S	32 0B	32 0B	...	...
New Eras	...	7 6B	7 6S	7 9B	8 6	8 0B
New Klainfonteins	31 0B	31 0B	31 0B	31 6B	31 0B	31 0B
New Rietfontains	10 3B	10 0B	10 9B	10 6	10 9B	10 9B
New Unifieds	...	...	...	17 0B	17 6B	17 6B
New Boksburgs	1 9B	1 9B	1 10B	2 0B	2 0	...
Nigels	16 0B	...	17 0B	17 0B	17 6B	18 0B
Orange Diamonds	1 9B	...	1 9B	1 9B	1 11	1 10B
Pretoria Cement Co.	55 6B	56 6	..	58 0B	57 6B	58 3S
Potchefstroom Est.	1 6B	–	1 6B	1 6B	1 6B	1 6B
Paardekraal Estates	...	1 0S	1 0S	–	1 0S	0 8B
Premiers Deferred	180 0B	–	180 0B	..	180 0B	180 0B
Premiers Preferred	..	–	...	...	180 0B	...
Princess	12 0	...	11 6B	12 0B	12 0B	12 0B

B Buyers. S Sellers.

	Friday, 26th	Sat., 27th	Monday, 29th	Tuesday, 30th.	Wed., 1st	Thurs. 2nd.
Rand Nucleus	3 0B	3 3	3 3	3 4	3 3S	3 3B
Randfontein Estates	31 3	31 0B	31 3B	31 0	30 6B	31 3
Randfontein Deeps	3 6B	3 6S	3 6B	3 9	3 9B	3 6S
Rooiberg Minerals	32 3	32 6B	33 0	33 0B	33 9	33 3B
Rand Collieries	9 0B	9 0B	...	...	9 0B	...
Rand Klips	6 0	6 1	6 0B	6 6	6 10B	6 10B
Ryan Nigels	...	...	4 0S	4 0B	4 0B	4 0S
Rood. Durban Deeps	25 6B	25 6B	25 6B	25 6B	25 0B	...
Robinson Deeps	54 0S	100 0S	53 0S	53 6B	54 0B	54 0B
Salisburys	...	2 0B	...	...	2 6B	2 6B
Simmer Deeps	4 0	4 0S	...	4 0B	...	...
South African Lands	4 6B	4 6B	4 6B	4 6B	4 8	4 8
S. Randfontein Deeps	3 9B	3 9	...	3 7B	3 9	3 8B
Sub Nigels	6 0B	6 0B	6 3B	6 3B	6 6	6 9
S. A. Breweries	39 6B	40 6	40 6B	41 6	40 0B	41 3
Springs Mines	15 6S	...	14 9	...	14 9B	15 0B
Trans. G.M. Estates	44 0S	...	44 0S	44 0B	44 0B	45 0S
Templa Tins	2 10	2 9B	2 9B	...	2 10B	2 10B
Trans. Coal Trusts	41 6B	42 9	43 3	44 6	44 6	44 0B
Tudors	..	2 0S	2 0S	..	...	..
Trans. Cons. Lands	...	30 0B	31 6B	31 0	...	..
Van Ryn Deeps	21 0B	21 3B	21 6	21 6	21 3B	21 3B
Village Deeps	43 0B	43 9B	44 0S	41 0B	44 0	43 6B
Vogel. Cons. Deeps	0 9B	0 9B	0 9B	0 10	0 10B	1 0B
Witwatersrands	56 0B	56 6S	56 0B	56 0B	56 6B	56 0B
Wolhuters	23 0B	23 0	23 3	23 9	21 6	21 3B
Witbank Collieries	42 0B	...	...	...	...	42 6B
Wit. Deeps	58 3S	60 0S	60 0S	58 0B	...	58 0B
West Rand Est.	2 9B	2 9B	2 9B	...	3 0S	2 9B
West Rand Con.	11 0B	...	11 0B	11 9B	12 0B	12 0B
Zaaiplaats	44 0	45 0	45 0B	45 0B	42 6B	42 6B

B Buyers. S Sellers.

Messina Copper.

The results of March operations at the Messina (Transvaal) Development Mine are as follows:—The mill ran 12½ days, treating 780 tons of ore and producing 78·59 tons of concentrates, average assay value 50·8 per cent. copper, and also 64 tons middlings, assay value 13 per cent. copper. Only ore obtained from development work was treated. The total footage was 616 feet. The 4th level Bonanza winzes are in good average values. The 6th level Bonanza footwall drive east assays 12 per cent. copper over 60 inches for a distance of 30 feet. The 8th level crosscut north is going in to prove footwall. The native labour supply is increasing. The new boiler plant is practically completed. A station pump has been installed at the 4th level.

Aurora West.

Number of feet driven, sunk and risen, 2,970 feet; ore mined, 41,567 tons; less waste ore discarded, 5,831 tons; ore sent to mill, 35,736 tons. Total yield, 10,000.923 ozs. (5.591 dwts. per ton). Revenue: £42,529 (23s. 9d. per ton); working expenditure, £34,639 (19s. 4d per ton); working profit, £7,890 (4s. 5d. per ton); capital expenditure, £9,113. The working profit shows an increase of £240 18s. 5d. over that for the previous year. The renovation of the mill foundations, etc., has now been completed, and since the middle of April the full 80 stamps have been running.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo Austrian Buildings, Box 2061, Johannesburg.

Finance, Commerce, and Industries.

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Effect of Industries on Community.

An interesting and accurate calculation has been made of what an industry employing 1,000 hands means to a community. It increases the population by 5,000 consumers. It adds £18,000 to the value of public utilities. The assessment is increased by £120,000. It pays out annually in salaries and wages at least £111,930. It represents through its buildings and the houses of its employees an investment of £400,000. The annual expenditure in food would be £12,500, in meat £1,920, in potatoes £1,000, in sugar £3,650, in milk £13,140, in butter £5,520, and in eggs £5,400. Summed up, this means that an industry employing 1,000 hands is worth £44,320 a year to the farmers of the district. The expenditure in clothing would be £33,750. With the annual payment of taxes added to the total expenditure on buildings, food and clothing, there is in all £485,670 turned into the town in one year through the coming of one great industry. An industry employing one thousand hands may be regarded as a large one, but the same percentage of results would follow in larger or smaller plants, so that one can easily begin to reckon for himself what any particular industry would mean to a town or city.

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Union Excise.

The annual report for the year 1911 of the Commissioner of Excise states, *inter alia:* The Excise receipts, or speaking correctly, the receipts of the Union which are recorded as Excise, for the financial year ended 31st March, 1912, will probably be as follows:—

	Spirits.	Beer.	Superfax on Foreign Spirits.	Cigarettes.
Cape Province ...	£148,000	£22,000	£37.000	£135,000
Natal Province ...	47,000	14,000	—	
Transvaal Province	—	44,000	—	
O.F.S. Province ..	—	4,000	—	
	£195,000	£84,000	£37,000	£135,000

These sums, however, do not truly represent what are the actual Excise receipts. The duties which are collected on Union spirits and beer, in the Provinces, which are not the Provinces of manufacture, are at present credited to the Customs revenue of the Provinces of collection. Obviously these collections should, as regards the whole Union, be deducted from the Customs and added to the Excise. The actual revenue, treated as Customs, received in 1911 from Union manufactures, was about as follows:—

Province in which Collected.	Spirits.		Beer.
Cape of Good Hope ...	—	......	£1,953
Natal	£5,886	......	1,584
Transvaal	109,373	......	51
Orange Free State ...	35,000	......	6,700
	£150,259	......	£10,228

The actual Excise, *i.e.*, the revenue derived from inland manufacturers of the Union, would thus work out on spirits as about £340,000, and on beer as about £94,000. Very little Natal spirit is drunk in the Union outside the Provinces of Natal itself. The above duty of £150,000 is really all derived from Cape spirits. This represents about 334,000 proof gallons. The quantity consumed within the Cape Province itself is about 838,000 proof gallons. The actual total quantity of Cape spirits drunk within the Union is about 1,172,000 gallons. It will be observed that the revenue from Cape spirits outside the Cape Province is slightly greater than that from Cape spirits drunk within the Province. Adjustment and equalization of the Excise duties will require the greatest care, or the loss in revenue will be very serious indeed. It will be interesting to note that the interchange of beers between the Cape Province and Natal is about equal, that the Transvaal practically consumes all its own and no other Union beer, and that the Orange Free State, whilst it consumes beer of its own, giving £4,000 duty, actually consumes beer from the other Provinces, giving a revenue of £6,700. The supertax on foreign spirits is confined to the Cape Province. The revenue received from the stamps on cigarettes will probably amount to £135,000 for the period from 1st July, 1911, to 31st March, 1912. This is abnormal, and is due to the stamping of large stocks on band within the Union at the time of the Act coming into force. The Act has been worked with the desire to avoid friction, and so that as little harm as possible to the very many small manufacturers should be done. Nearly 170,000 gallons of Natal rum were exported to England in 1911. Of recent years Natal rum has been greatly improved.

April Customs Returns.

The Customs returns for the Union of South Africa during April, issued by the Department of Commerce and Industries on Tuesday night, are as follows:—

	Imports.	Exports.	Revenue duty.
Cape Town	£536,222	£3,158,061	£67,545
Port Elizabeth	707,376	262,090	72,138
East London	290,028	152,015	35,594
Durban	1,079,994	480,479	96,371
Johannesburg	—	—	68,144
Lourenco Marques	452,775	—	16,800
Other ports and stations	38,861	140,120	20,844
General Post Office	—	—	5,272
Totals	£3,105,256	£4,192,765	£382,708

Cape Town exports include gold exported. Duty collected to magistrates in the Orange Free State is not included.

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" " P.O. Box 266 Salisbury.

JOHANNESBURG TRADE AND COMMERCE IN 1911.

Official Review of Timber, Mining Material, Electrical and Engineering Trade in the Year.

In conjunction with the various statistics contained in the annual reports of the Johannesburg Chamber of Commerce, the following comments on the principal features of the trading operations during 1911 may be noted:—

Mining Material and Machinery.—In last year's report it was pointed out that, during 1909 and 1910, there had been a large increase in mining requirements, but that indications pointed to a falling off in turnover during 1911. This forecast has been justified. The experience during the year was that, while in mining materials and machinery supplied from stock a fairly satisfactory trade was done, the turnover was less than in the previous year, and on orders for indent there was a substantial falling off. It seems probable that during 1912 these conditions will continue, seeing that so little is now being done in mining development and equipment. The effect of the keen competition in this trade in forcing down prices is strongly marked, but this must be always expected whenever the volume of trade tends to decline.

Timber.—Taking all classes of Baltic timber, although the turnover was somewhat smaller than in 1910, the volume of business was still very considerable. The advantage to merchants was, however, discounted by reason of the excessive stocks in the country, due to heavy importations in excess of the demand. As a consequence, prices were cut down to an unprofitable level, particularly during the first half of the year, and, although there was afterwards an improvement in this regard, the margin of profit was a very small one. It is to be hoped that the commitments of this timber in the immediate future will be kept down, so as to facilitate the realisation of the heavy stocks already in the country. The demand for log timber (both Oregon and pitch) was more restricted than in 1910, mainly owing to the completion and cessation of mining construction work and shaft sinking. Stocks were abnormally heavy, and caused the realisation of some quantities of Oregon wood at prices which were below actual cost. Pitch pine held a somewhat better position in the market, but it was evident that some importers still fail to realise the dangers of over-importing, and particularly so when, with falling local prices, there has been an increase in freight charges. Altogether, timber merchants have had rather a worrying time, and there are no immediate signs of improvement.

Building Material and Hardware.—In 1911, as was the case in the previous year, building operations were active, and it is gratifying to note that, while a certain number of houses were erected by speculative builders, they were in the main built for the owners. There are distinct indications that many who formerly risked their savings in the share market now prefer to invest in property. In builders' furnishings there has been a tendency towards the purchase of a cheaper class of article than formerly, and this applies even to fair-sized villas. Stocks as well as general conditions in this trade appear to be normal, but some caution should be exercised in giving credit, having regard to the number who have newly entered the building trade, many of whom are operating on very little capital.

Electrical Trade.—Electrical business during 1911 showed a considerable falling off as compared with 1910, owing to most of the orders for the construction work on the Power Companies' plants and on the mines in connection with the electrification scheme having been placed in the former year. Prices ruled extremely low owing to severe competition, but, towards the end of the year, they were advanced somewhat in view of the risk of the heavy penalties now being inflicted by the mining houses.

Grocery and Provisions (*Wholesale*).—The improvement in the wholesale grocery trade reported for 1910 was fully maintained during 1911, and a very satisfactory year's trading resulted. A marked feature of the year was the advance in value of nearly all foodstuffs, principally owing to the extremely dry summer in Europe; such everyday commodities as rice, cheese, condensed milk, sugar and coffee increased in cost by about 25 per cent. South African foodstuffs have made headway, notably wheaten meal and flour, butter, bacon, cheese, jams, and dried and preserved fruits. In contradistinction to similar imported articles these were sold at lower prices than was the case in 1910. Coast competition was keenly maintained, and some Coast houses now quote to local retailers at delivered prices to enable the latter to more readily compare such quotations with local wholesale prices. But Johannesburg merchants are undoubtedly assisted in retaining their local trade by the "distributing rates" quoted by the South African Railways. A continuing drawback is the readiness of many firms to give credit almost indiscriminately and without due enquiry; retail firms are given longer terms than ever, and the spot cash trade has practically disappeared. In view of the losses which they formerly suffered by a too liberal system of credit, oversea suppliers are not now so ready to offer terms to firms unknown to them; this, it is hoped, will have a healthy effect on local wholesale trade.

Grocery and Provisions (*Retail*).—Business, on the whole, was fairly good, but competition continued to be keen and, unfortunately, too large a proportion had to be done on a credit basis. In previous reports, the adoption of a system of a weekly payment of wages has been urged, and it is to be regretted that this much-needed reform is not nearer of accomplishment. With regard to articles of South African production, these have much improved in recent years, but it is unfortunate that their sale is hampered owing to prejudices which customers still entertain against them. The recommendation of the Chamber for the abolition of Christmas presents should be more generally followed up, as in the past the practice of giving these presents has been a very heavy tax upon grocers, and it is time it was entirely abolished.

Soft Goods (*Wholesale*).—The expansion in trade which was noted during 1910 was fully maintained during 1911. Business with the country districts has been satisfactory, and was assisted by the Railway Flat Rates, which enabled the country storekeepers to find a market for a large quantity of maize in the Cape Province, and to reduce their liabilities. Owing, however, to drought, it is feared that the mealie crop will in 1912 be considerably restricted. The trade with Reef and Kaffir storekeepers was also well maintained, but there was increased competition and, on the other hand, the cost of cotton advanced. Under these conditions, and also by reason of the liquidation sales which occurred, prices were in many lines forced down to very little beyond English cost. The town sorting-up trade has been very restricted in volume owing to the fact that large stocks were held by retail houses, who, in consequence, required fewer filling up lines.

Soft Goods and General Drapery (*Retail*).—The public demand was fairly maintained during the past year, but the remarks made in the last annual report concerning excessive stocks and undue resort to "sales" still indicate the unsatisfactory features of this trade. Over-stocking led to the cutting of prices, and competition, which is very keen in this trade, constantly took the form of special clearance sales, to the detriment of the regular normal trade. An improvement may, however, be noted in regard to a tendency to curtail credit. In men's outfitting, and in footwear, competition was not so keenly pressed, and fairly reasonable profits were earned.

Produce.—The year must have been on the whole a successful one for producers, both in regard to demand and to prices secured. The rigorous grading of maize has established a sound market in Europe, and prices have hardened, the South African article realising from 2s. to 4s. more per quarter than that obtained for La Plata maize. The introduction by the Railways of flat rates for grain and forage has also proved beneficial in opening up for Transvaal products markets in the Cape Province, which previously could not be reached with any advantage. The importance to agriculturists of the Rand markets is shown in the fact that over 14,000 tons of maize were sold on the Johannesburg morning market during 1911, at an average of 9s. per bag (for comparatively low grades), while more than double this quantity was delivered direct to stores and mills within the Municipal area. It is gratfying also to note that the mining contracts have been more evenly distributed and prices were more uniform. The 1911 wheat crop proved to be a record one in nearly all producing districts; and some of the Transvaal samples were exceptionally fine. Attention should be given to Transvaal oats. The production is exceeding the local demand, but in order to earn good markets elsewhere it will be necessary for the producer to grow a better standard of oats. Farmers should take liberal advantage of the exceptionally cheap rates which the Railways have laid down for the conveyance of fertilizers. The absence of legislation compelling the use of uniform weights still continues to cause a great deal of difficulty, and it is hoped that Parliament will deal with the Weights and Measures Bill at an early date. Another subject requiring legislation is that of adulteration. Many complaints arise of disabilities suffered owing to lack of protection against fraud, and the produce trade would welcome a law providing that such products as wheaten bran, Kaffir corn, malt, ground nut meal and mealie meal must be sold pure, unless the adulterants be cleary specified at the time of sale.

Van Ryn Gold Mines.

Number of feet driven, sunk and risen, 6,023.5 feet; ore milled, 125,195 tons; less waste ore discarded, 8,755 tons; ore sent to mill, 116,440 tons; total yield, 38,165.842 ozs. (6.558 dwts. per ton). Revenue, £162,408 (27s. 10d. per ton); working expenditure, £89,139 (15s. 3d. per ton); working profit, £73,268 (12s. 7d. per ton); capital expenditure, £6,607. The profit is £1,411 7s. 11d. less than that for the previous quarter. The development footage accomplished is 1,421½ feet in excess of the footage driven during the preceding quarter. The erection of the new steel headgear and electric winding plant at No. 2 shaft is proceeding.

Roodepoort United.

Number of feet driven, sunk, and risen, 5,230 feet; ore mined, 103,872 tons; ore from surface dump, 1,880 tons; less waste ore discarded, 19,557; ore sent to mill, 86,195 tons; total yield, 21,169.720 ozs. (4.945 dwts. per ton). Revenue, £90,241 (21s. per ton); working expenditure, £78,070 (18s. 2d. per ton); working profit, £12,171 (2s. 10d. per ton); capital expenditure, £9,716. There is a decrease in the working profit, as compared with the previous quarter, of £11,231 7s. 11d., which is attributable chiefly to the temporary falling off in grade of several of the stopes which were contributing ore to the mill.

PROTECTION AND YOUNG INDUSTRIES.

Local Manufacturers and the Recent Commission's Report—Temporary Sacrifice Necessary. —The Case for a Tariff.

A general meeting of members of the Transvaal Manufacturers' Association was held last week in the office of the Chamber of Commerce, to consider the formation of separate trade committees and to deal with the report of the Industries Commission. Mr. J. Mitchell (Olifantsfontein Brick and Tile Co.) presided.

REPORT OF THE COMMITTEE.

The Secretary, Mr. J. M. Buckland, read the report of the Executive Committee as follows: The Customs Regulations Act now before Parliament includes the dumping clause for which industrialists have so long agitated. It is regrettable to learn that the importing agencies are privately opposing this most valuable and indeed indispensable section of the Act; and that the Minister for Commerce and Industries anticipates some difficulty in carrying it through. For your information a copy of the proposed clause is appended:—"In the case of articles imported into the Union of a class or kind made or produced in the Union if the export price or the actual selling price to an importer be, at the time of its exportation to the Union, less than the current value, as defined in that section, of the same article when sold for home consumption in the usual and ordinary course in the country whence they were exported to the Union, there shall, in addition to the duties otherwise prescribed, be levied, collected, and paid on such articles on importation into the Union a special duty (or dumping duty) equal to the difference between the said selling price of the article for export and the said current value thereof for home consumption. The Governor-General shall from time to time determine the articles to which the special or dumping duty or additional duty shall apply, and shall cause the same to be notified in the "Gazette."

PROTECTION OF INDUSTRIES.

The report of the Industries Commission has now been before the public for some weeks. It is, perhaps, to be regretted that the report deals with the question of the protection of industries in a somewhat hesitating manner. The majority of the Commissioners appear to have perceived that the stimulation of domestic production by protection is the true and scientific means of reducing the cost of living. They recognise that so long as a people depends for its ordinary supplies on importation from distant countries that people is bound to maintain a high scale of expenditure. In applying these principles, however, the recommendations are in many cases qualified by an apparent want of confidence. But, however conservative the recommendations of the report may appear to those who perceive the urgent need for establishing a manufacturing population in South Africa, yet the report undoubtedly marks an advance in our industrial and fiscal policy. It is a step towards helping the country to free itself from its excessive and most costly dependence on foreign supplies. The community has, therefore, experienced disappointment in learning that no legislative effect can be given to its recommendations during the present session of Parliament. The Government has, however, intimated to this association that the whole question will be dealt with during the recess. As soon as the session is over and the officials have returned to Pretoria investigation will be made into the Commission's proposals and into the effect which the action proposed or action somewhat similar will have on the various industries concerned; and in what manner public interests will be affected.

ACTION BY MANUFACTURERS.

It is highly desirable that manufacturers should as early as possible prepare to meet this position. In each case where a separate trade association exists that association should act. In those cases in which no trade association has yet been formed your executive advises that special trade committees should be called together. And your executive, if you approve, proposes at once to invite its members to form these committees, and to meet at the association's offices to consider their position and policy. It is probable that the lapse of time and the publication of the results of the industrial census will have considerably changed the position and apparent needs of many industries since the Commission took its evidence now nearly twelve months ago. No information, however, is yet available as to what opportunity will be afforded to industrialists and others to bring forward representations modified in the light of any such changes. Your executive desire to invite the special support of members to the principle that all public bodies in placing orders for supplies should give a certain preference to local manufactures. Some of the Government Departments have definitely accepted and habitually act on this principle, but on the whole there is great reluctance on the part of public bodies to recognise the vital importance of supporting local labour. In a recent case, for instance, the Municipality of Johannesburg, having to order a large number of garden seats for the parks, threw out the tenders of local makers because they were about 7½ per cent. above the tender from abroad, and this though local manufacture presented several points of advantage over importation.

MAINTAINING THE LOCAL POPULATION.

Such bodies should not forget that every civilised community recognises the importance of encouraging and helping to maintain the local population by whom the revenue of the public bodies is contributed. Even in the head centre of Free Trade this policy is advocated. The Manchester Chamber of Commerce has recently, for instance, petitioned the Admiralty Commissioners that the Army and Navy contracts for boots and shoes should be reserved for British firms. And the Commissioners have agreed to protect British manufacturers by stipulating in the specifications that preference shall be given to goods of British make. South Africa alone appears to lack the courage and the confidence to make some moderate temporary sacrifice in order to nourish and build up her own young and struggling industries. The South African Manufacturers' Association of the Cape Province has this week held its annual congress at Port Elizabeth. The unsettled points of difference—connected principally with railway rates—have prevented this association from being represented at that congress. But your executive notes with gratification that the agenda paper contains proposals reiterating the former resolutions binding South African manufacturers to the principle of minimum railway rates on raw materials.

RAILWAY RATES.

The interests of manufacturers may be seriously affected by the line which may be followed by the Government in making the reductions in railway rates now in contemplation. It is proposed this year to make reductions to the amount of £750,000. If these reductions are made in through rates from the coast without the most careful discrimination it is obvious that their effect may be most disastrous to local manufacturers. Your executive is addressing the Railway Department on the subject, and it is desirable that all trades that may be affected should formulate their requirements, and make a statement of their special circumstances without delay.

DISCUSSION.

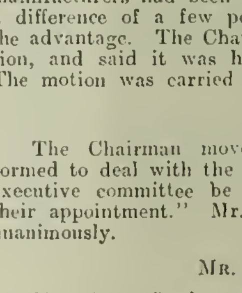
Regarding the dumping clause Mr. Newmark moved: "That the Transvaal Manufacturers' Association considers legislation against dumping to be urgently necessary to prevent the impoverishment of local manufacturers, and urges the Government to insist on the enactment of the dumping clause." The clause, he said, was in use in other countries and was surely necessary in South Africa. Mr. R. M. Morris seconded the resolution. It was carried unanimously. Mr. Wevell moved: "That this association desires to press on the Government and Municipalities the importance of encouraging the local population by giving a definite and appreciable preference to local manufacturers." Orders, he contended, should not be sent oversea unless there was an immense difference in prices. Everything should be done to keep orders in the Province, and the manufacturers did not growl so much if they were kept in the Union. Mr. Newark said the local manufacturers were quite capable of carrying out the work. The theory of local manufacturers being inferior to imported manufacturers had been knocked on the head, and if there was only a difference of a few per cent. the local manufacturer should have the advantage. The Chairman expressed hearty support of the resolution, and said it was high time its object was carried into effect. The motion was carried unanimously.

TRADE COMMITTEE.

The Chairman moved:—"That separate trade committees be formed to deal with the Industries Commission's report, and that the executive committee be instructed to take the necessary steps for their appointment." Mr. Wevell seconded. The motion was carried unanimously.

MR. H. P. GORDON'S PAPER.

Mr. H. P. Gordon read a paper dealing with Mr. W. A. Martin's minority report in the Industries Commssion and its attitude towards agricultural industries. Mr. Martin, he said, was so imbued with Free Trade bias that he regarded the imposition of protective duties as something sacrilegious. Farmers would shortly be finding a market for their butter outside the Union, and the price within the Union would be regulated by the price obtained in the world's markets. South African's dairy industry was flourishing; the price of butter and milk had been reduced since 1906, and would be still further reduced. He predicted dire consequences to the industry if the duties on dairy products were removed as advocated by Mr. Martin. The process of cheapening of food stuffs still continued, and would continue until the level of the markets of the world was reached. If the spirit of cheapness which Free Trade involved ever obtained in South Africa wages would decline among all classes of wage earners. The minority report made too much of a fetish of the high cost of living. A highly developed manufacturing system must be made possible, and capital assured of reasonable protection against the low wage competition of other countries. (Applause.) Mr. Gordon was accorded a vote of thanks.



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HONEYKOP GOLD MINES.

Registered March 22; capital, £150,000, in £1 shares. Objects: Gold and general miners, prospectors, explorers, etc.; to acquire and work a group of claims known as the Honeykop Claims, near Leydsdorp, Northern Transvaal. Minimum subscription, seven shares. First directors (not less than three or more than seven) to be appointed by signatories. Qualification, 200 shares. Remuneration (except managing director), £200 each per annum (chairman £250) and 10 per cent. of the profits payable out of surplus remaining after 10 per cent. dividend is paid, divisible. Registered office, 190, Dashwood House, E.C.

ROMOLA NIGEL GOLD MINING COMPANY.

Particulars filed March 19; capital, £25,000, in 1s. shares; registered in Transvaal on March 15, 1907. British address, 307c, Winchester House, E.C. D. C. Wilson and W. Crawford, of Mayfield, Grange Road, Sutton, are authorised to accept service.

KATANGA HOTELS AND STORES COMPANY.

Registered March 22; capital, £41,000, in 40,000 £1 ordinary and 20,000 1s. founders. Objects: To carry on in Belgium, Belgian Congo, in Katanga, and particularly at Elisabethville, Kambove, and Etoile du Congo, and elsewhere, the business of hotel, restaurant, and lodging-house keepers, etc. Minimum subscription, 100 shares. First directors (not less than three or more than seven): R. de Clercq, P. Duhyvetter, J. Jeurissen, F. Morse, and Major H. Vane Stow. Qualification, £100. Remuneration, £100 each per annum (Chairman, £125) and a percentage of the profits. Registered office, 79, Queen Street, E.C.

TRANSVAAL OIL SHALE SYNDICATE.

Registered March 27; capital, £60,000, in £1 shares. Object: Oil and general miners, mining engineers, preparers for market of metalliferous quartz and ore, oil shale, coal, and all mineral sands, metals and other substances, etc. Minimum subscription, 100 shares. First Directors (not less than two nor more than five) to be appointed by signatories. Qualification, £100. Remuneration, £100 each per annum (£50 extra for the Chairman). Registered office, 52 Queen Victoria Street, E.C.

AKWA-IBAMI SYNDICATE.

Registered March 27, with a capital of £1,000 in £1 shares, to carry on the business of miners, prospectors, explorers, metallurgists, etc., in Africa and elsewhere. Private company. Table "A" mainly applies. Registered by W. T. Hick, Broad Street House, E.C.

ZAMBESI NAVIGATION COMPANY.

Registered March 28, by Slaughter and May, 18 Austin Friars, E.C. Capital, £50,000 in £50 shares. Objects: To take over (1) the transport and landing business carried on at Chinde by Ludw. Deuss and Co., of Hamburg, their steam and other vessels and ships, tugs and launches, lighters, barges, and boats of all kinds, and their workshop and wharf industry at Chinde, aforesaid, and (2) the barges and boats from the Sena Sugar Factory, Limited. Private company. The first Directors (to number not less than three nor more than four) are J. P. Hornung and R. W. Vroon (nominees of the Sena Sugar Factory, Limited), and Ludw. Deuss (nominee of Ludw. Deuss and Co.). The said firms may nominate two directors and one director respectively, while holding 100 shares. Qualification, £500. Remuneration, £100 each per annum.

SOUTH AFRICAN DISCOUNT COMPANY.

This company was registered in Dublin on March 26 with a capital of £1,000 in £1 shares, to carry on the business of money-lenders, brokers, discounters, etc. Private company. J. I. Epstein is the first director. Registered office, 11 Nelson Street, Dublin.

Companies in Liquidation.

Bailey's Copper, Ltd. (voluntary), March 12th; claims to be filed and debts to be paid to the liquidator, L. Kearns-Jacobs, within 30 days from April 12th.

Germiston Furnishing Co., Ltd. (voluntary), March 22nd; meeting will be held at the offices of Adam and B. Alexander, Sacke's Buildings, Joubert Street, Johannesburg, on April 26th. Nahum Cohen, liquidator.

Rand Rhodesia Syndicate, Ltd.; final meeting of shareholders will be held at 96, Exploration Buildings, Johannesburg, on May 10th. Howard Pim, liquidator.

Paardeberg West Diamond Mines, Ltd.; a meeting will be held at 3, Transvaal Bank Buildings, Fox Street, Johannesburg, on May 8th.

Brakdam Diamond Mines, Ltd. (voluntary); a meeting will be held at 3, Transvaal Bank Buildings, Fox Street, Johannesburg, on May 8th.

Contracts Open.

The Chairman of the Tender Board, Provincial Auditor's Office, Capetown, invites tenders for the reconstruction of bridge over the Knysna River. (May 13.)

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the erection of new public offices at Murraysburg; also for repairs to Residency at Murraysburg; also for repairs to public offices and residency, Richmond, and repairs to gaol at Richmond (May 22).

The Municipal Council of Krugersdorp invites tenders for 50,000 Imperial gallons of creosote (May 13).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for structural steelwork, etc., for new foundry at Pretoria (June 4); also for disinfectants (May 21); also for the supply of 876 Petersburg standards of Baltic timber (May 21).

The Secretary to the Tender Board, S.A.R., Headquarter Offices, Johannesburg, invites tenders for the supply of 2,741 Petersburg standards of Baltic timber (June 11).

The Municipal Council of Krugersdorp invites tenders for certain extensions and additions to the electric light supply and power mains, under the following heads: (1) Overhead material and mains; (2) Cables and joint boxes; (3) Booster and switch board (May 15).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of horse rations to the Urban Police (Cape Division), (May 15).

The Municipality of Boksburg invites tenders for the supply of 2,000 gallons of creosote in drums (May 14).

The Municipality of Benoni invites tenders for the supply of one hundred and fifty water meter boxes (May 15).

The Roodepoort-Maraisburg Municipality invites tenders for the supply of electric light materials for the period ending 31st December, 1912 (May 13).

The Potchefstroom Municipality invites tenders for the supply of 750 Braime's No. 8 steel sanitary buckets (May 27).

The Municipal Council of Salisbury invites tenders for materials to be supplied and work to be executed in the construction of a reinforced concrete covered service reservoir, high level tank, etc. (May 22).

The Town Clerk of Clocolan, O.F.S., invites tenders for the erection and completion of a water scheme at Clocolan (May 31).

Mr. Archer W. Hoskings, architect, Consolidated Buildings, Johannesburg, invites tenders for the erection of St. Aidan's Church, Yeoville.

The Rand Mines, Ltd., Buying Department, Box 1594, Johannesburg, invites tenders for the supply of the whole or any portion of the requirements of mealies to the Companies controlled by the Rand Mines, Limited, for a period of twelve months from 1st July, 1912.

Mr. J. F. Beardwood, architect, Ziman's Buildings, Johannesburg, invites tenders for erection and completion of a three-storied brick building at the corner of Joubert and Jeppe Streets, Johannesburg.

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the following structural steelwork, viz.: Locomotive shed and workshops, Braamfontein; coaling plant, Capetown (May 7).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of the following material to the Department of Posts and Telegraphs:—3 miles switchboard cable, 42 wire, as per specification; 2 miles switchboard cable, 63 wire, as per specification; 3½ miles switchboard cable, 84 wire, as per specification. Quotations must include delivery, as shown below, and indicate time within which delivery will be effected: Cable, 42 wire, Capetown 1 mile, Johannesburg 2 miles; cable, 63 wire, Johannesburg, 2 miles; cable, 84 wire, Johannesburg, 3½ miles (May 8.) For supply of mealie meal, forage and paraffin (or petrol) tins to the Forest Department, Transvaal Conservancy. The supplies required are as follows:—Government Nursery of Plantation at Belfast, 50 bags mealie meal; Ermelo, 120 bags mealie meal, 12,000 lbs. forage; Irene. 200 bags mealie meal; 14,000 lbs. forage; Graskop, Pilgrims Rest, 90 bags mealie meal; Jessievale, Lake Chrissie, 140 bags mealie meal, 10,000 lbs. forage, 45,000 5gal. paraffin or petrol tins; Lichtenburg. 90 bags mealie meal; Machavie, Potchefstroom, 80 bags mealie meal, 8,000 lbs. forage; Middelkop. Tzaneen (nearest railway station, Munnik). 130 bags mealie meal; Pan, Middelburg. 120 bags mealie meal, 36,000 lbs. forage; Woodbush, Haenertsburg, 150 bags mealie meal (May 8.) For the supply of leather to the Central Prison, Pretoria, and the Breakwater Reformatory, Capetown. (May 15).

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ADVERTISEMENT RATES ON APPLICATION

Automobile Notes.

Tyre Repairs.

The repair and periodical replacements are probably the most important of all expenses connected with the running of a motor vehicle, and in South Africa, more than anywhere else, perhaps, are these particular items of upkeep sources of continual worry and outlay to all motorists, but it may be added that year by year appreciably better results are being obtained in regard to the life of tyres owing to the marked improvement in the road ways of the country. Economy in point of petrol consumption is receiving studious attention from car manufacturers, and the reduction brought about by the present-day efficient carburettors is very gratifying, especially in countries where high prices obtain for motor spirit. The tyre bill, however, must for long loom large in comparison with general upkeep, and car repairs in other respects. A knowledge of repairing at once as troubles become apparent to the motorist, who should always be equipped with one or other of the many appliances for roadside use, is useful as a preventative measure, in cases where serious damage would result through neglect. Although tyre manufacture is being highly specialised to-day, and every possible precaution is adopted by combining the finest materials and workmanship, yet in view of the abnormal strain and stresses to which motor car tyres are constantly subjected, few firms will accept the risk of guaranteeing their productions; most, however, will adjust matters with the purchaser, provided any existing defects can be attributed to faulty manufacture. Round treads for South African rough roads are being favourably recognised, it being pointed out that square treads invite all the destructiveness the road is capable of affording over the whole of the surface they present to the ground while round treads, on the other hand, offer the minimum of surface resistance, with a maximum resiliency. Many substitutes for rubber, from time to time, have been announced, but beyond arousing the trade for the moment, to their possibilities, very little has been achieved, from a marketable standpoint, by any of these alleged valuable discoveries. The rubber in the manufacture of a tyre to withstand successfully the many road difficulties encountered daily in this country, should, briefly, combine the two great essentials of toughness and resiliency which render it difficult to cut, and thus obviates the introduction of the destructive elements of grit and water to the tyre, which militate so strongly against its life.

Courtesies of the Road.

The pleasures of motoring, it may be said, are greatly enhanced by the knowledge that a high code of honour exists among motorists, its recognition being responsible for the observance of the road courtesy, which is invariably extended at all times and under all circumstances to motorists in dilemma, and which cannot be over-estimated in such a sparsely-populated country as South Africa, where aid from outside sources is often a remote possibility, or if forthcoming entails charges altogether disproportionate to any assistance which may be rendered. In the latter connection any motorist who has been unfortunate enough to enlist the services, say, of a team of oxen to extricate a car, which has stuck fast, can endorse the statement in regard to the excessive nature of the charges exacted, for work of this sort, by the *naive* owners of the beasts. The reputation of the motorist, in regard to the observance of the courtesy mentioned, it is to be regretted, is not always upheld, there being, of necessity, the exception which proves the rule, represented by the selfish motorist. Some members of this kidney received considerable publicity, though names did not eventuate, last week in a case reported from the districts, which called forth much comment in motorist circles. It seems a Johannesburg gentleman, of the courteous kind, travelling alone, who, by the way, rendered valuable assistance on two or three separate occasions that day to cars in distress, eventually found himself, at an isolated point, in similar plight, consoling himself, however, with the thought that all members of the motorist fraternity were one in regard to reciprocal duties, and that assistance was only a question of time. His confidence in this wise was destined to be rudely shaken, as the occupants of a car, who could not fail to notice his difficulty, whizzed past without questioning or offering to assist in any way. Happily such cases are infrequent, and road courtesy, it is satisfactory to reflect, is more honoured in the observance than the breach, and the great army of reputable motorists need not be perturbed over the action of such individuals, as those in question, whose principles, it would appear, have much in common with those of the "motor-hog."

The American Invasion.

Considerably over 3,000 complete motor cars were imported from the United States to Britain during last year, which prove that the threatened American invasion by motor car manufacturers is not altogether the bogey which some people maintain it is. On the contrary, the invasion, it will be found, is very real, when one remembers that this number merely refers to completed cars, without an additional reference to numbers of chassis introduced in sections, assembled in Home factories, and turned out complete with British bodies, ostensibly British manufactured cars. On the other hand it is interesting to remark that the recent Toronto Show was a great success, and the business done indicates that there is a big market for the British car in Canada. The show, it is said, was the third largest held on the American Continent, eclipsing New York in point of numbers of cars and exhibitors, showing an increase of over 40 per cent. over the previous year. British cars did very well, several exhibitors disposing of all their cars, while the British manufactured lorries on exhibition also attracted much attention. Now, when one considers that the manufacture of automobiles in Canada is by no means advanced, in comparison with the enormous development attained to in the United States, the Toronto Show reflects very creditably the push and enterprise of the Colonists in that part of the Empire, and incidentally contains a lesson which may be learned to advantage by the dwellers in these parts, in point of what can be achieved, in an exhibition of this nature, when the organisation is complete.

The Price of Petrol.

It is pointed out that the increased price of petrol is not due, as some suppose, to the fact that the imports are smaller, as the Board of Trade returns convince to the contrary, by showing that 9,208,294 gallons were imported during the first two months of 1912, against 9,171,632 gallons for the corresponding two months of last year. The growing demand, evidently, accounts for the increased costs.

Car Varieties in Johannesburg.

Mention was made some time ago of the fact that some 100 different types of cars are in use in Johannesburg and on the Rand, and to this immense variety new makes are being added almost weekly. One of the latest is the "Waverley," a very smart four-cylinder, high-grade, British-made, light car, which has many points to recommend it, being elegant in appearance, flexible, silent and economical. It comes to this country with an excellent reputation as a hill climber, an essential feature in a machine for use in these parts. The specification shows it to be fitted with the Zenith carburettor, and a Bosch magneto. The gear is on the gate selective sliding principle, with very short shafts and large wheels. It is interesting to note that the springing is on the "Lanchester" system of special registered design, which the agents' catalogue illustrates fully. The car, briefly, is designed to supply a demand which has been realised for long, for a small four-cylindered car at a figure within the reach of all, without sacrificing any of those essentials embodied in the higher-priced car, and this the manufacturers have evidently succeeded in doing by placing a "Colonial" Waverley on the South African market, complete for £335. The Waverley agency is in the hands of the Vauxhall agents, T. B. Adair & Co., Hillbrow, Johannesburg.

ANNOUNCEMENT.

The decision of the lower Court in the suit brought by our Company against the Tonopah - Belmont Development Company for infringement of the Moore Process Patent, which we confidently expected to be in our favour, has been rendered against us. An appeal will be immediately taken and will be heard and decided before summer. The lower Court finds that the Moore Patent is not infringed, on the ground that the stationary type of filters is not the equivalent of the Moore movable type. It is proper, therefore, that we should inform users of the stationary type that we exclusively control the Cassel patents, which are the basic patents on all the Stationary types of filters.

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MOORE FILTER CO.,

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The Week's Company Meetings.

BRAKPAN MINES, LIMITED.

Excellent Results.

Labour Questions.

Dividend Outlook.

The ninth ordinary general meeting of shareholders of the Brakpan Mines, Ltd., was held at 11.45 a.m. on Tuesday in the board-room, Corner House, Mr. J. G. Hamilton presiding. There were 452,749 shares represented out of an issue of 750,000.

The Chairman's Speech.

The Chairman in moving the adoption of the report and accounts, said· It was originally intended to hold the annual general meeting of this company at the end of March, but a posiponement was made to this date in order to meet the wishes of European shareholders. The reports and accounts were issued both here and in London on the 21st ultimo, an arrangement which gave sufficient time to shareholders on the other side to make representations, if they so wished, at this meeting. It is the intention of the Board to propose such alterations in the articles of association of the company as will give European shareholders ample time to consider the reports and accounts prior to the holding of future annual general meetings, which it is proposed to fix towards the end of May. Under this arrangement the notice convening the meeting, as issued from the head office here and the London office, will in future be accompanied by the reports and accounts to be considered at that meeeting. An extraordinary general meeting of shareholders will have to be called later on this year to authorise whatever alterations may be necessary in the company's articles to admit of the proposed procedure being adopted.

Highly Satisfactory Results.

The reports, which have now been in your hands for some weeks, have given shareholders the very fullest information in connection with the company, the expenditure from its inception to the end of 1911, and the results obtained by reduction operations during the first seven months of milling. Though directors have had, in the ordinary course of events, their fair share of work and anxiety since we last met, I am happy to be able to say to-day that the results obtained have been, and continue to be, of a highly satisfactoory nature. It is not necessary for me to traverse the large amount of detail given in the annual report, and I propose to restrict my remarks mainly to such information as will fully carry your knowledge of the position of the company up to date. The monthly declarations and the quarterly reports issued have throughout kept you informed as to the progress of events; and in the annual report you possess, if I may venture to say so, a summary which faithfully exhibits the actual position of the company as at the end of the financial year in review.

Some Figures.

Briefly recapitulating working figures, reduction operations to the end of December showed that 241,204 tens of ore had been treated during the seven months, giving a value recovered of £1 7s. 6½d., at a working cost of 18s. 4d. per ton, thus leaving a profit of 9s. 2½d. per ton, and a total profit of £110.376 which, I submit, is a very favourable result for the initial milling period with all its attendant difficulties. The report issued for the quarter ended the 31st ultimo showed an improvement on those figures, the results for the three months having been a recovery value of £1 8s. 9d. per ton, working costs of 17s. 9d. and a profit of 11s. per ton milled. The total profit for the quarter amounted to £70,715, and in addition we held in reserve at the end of March 3.800 ozs. of fine gold. Incidentally I would, however, remind you that the profit for this last quarter makes no allowance as is usual in interim reports, for the Government profits tax of ten per cent., the figures of which are influenced by other considerations in addition to those of the actual working profit obtained, and are worked out in conjunction with the Inland Revenue Department of the Treasury after the completion of the company's financial year.

Gold Reserves.

In regard to the gold in reserve, to which I have just made reference, your directors are of opinion that this reserve should be declared forthwith, and, unless shareholders express any decided views to the contrary at this meeting, this proposal will be carried out and the actual value of the gold won month by month will in future be the figure of the ordinary monthly declaration. The doing away with the gold reserve is favoured by many shareholders in Transvaal companies; but it must not be overlooked that the practice was originally instituted for the purpose of preventing violent and disturbing fluctuations, and that its abolition may quite possibly result in considerable differences in the output of gold and the profits made month by month. Personally, I may say that I am entirely in favour of doing away with the reserve, especially seeing that legally we are bound to declare it monthly, and the publication in my opinion, does away with its practical utility. Your directors wished, however, before eliminating the comparatively small reserve we have in hand to explain the position fully to shareholders, in order that any fluctuations which might quite possibly occur in the ordinary way of working should not give rise to undue apprehension. Naturally the company when making its declarations, and when issuing its quarterly reports, will be careful to inform shareholders in regard to any special circumstances affecting the returns either favourably or adversely.

Native Labour Supply.

You will have seen from the reports that we have instituted a "Development Reserve Account," which at the end of December last, amounted to £6.644, and represented that portion of the 1s. 6d. per ton crushed so far allocated to development but not then expended, mainly owing to an insufficient supply of native labour, but also partly to the inevitable development dislocation attendant on the first few months of crushing operations. I am glad to be in a position to tell you now that the supply of native labour has been materially increased during the last few months; that we expect this month to do at least the development footage called for by the tonnage milled; and that we are confident of making up all arrears of development well before the end of the current year. In connection with this question of unskilled labour, I would draw your attention to the remarks of your consulting engineer in regard to the member of machine drills being utilised in the mine. The provision of these drills has, of course, called for extra expenditure; but it should be realised that their employment gives us a decidedly more assured position vis-a-vis the variations in the native labour supply.

Cost of Renewals.

In connection with working costs, I should like to mention that it is intended from now on to charge all renewal, as well as maintenance, costs direct to working expenses in the month in which they are incurred. It has been the practice on many mines to carry renewal charges in suspense; but after very full consideration and no little experience your directors have come to the conclusion that the more satisfactory policy in the end is to defray the cost of all renewals as and when incurred. This course may perhaps occasion some variation in the monthly costs; but as we propose to face the variation in output it would, in my opinion, be as well to face this issue at the same time. We propose to treat expenditure in respect of any ordinary increase in plant, such, for instance, as an additional tube mill, which could not be fairly made a direct charge against monthly working costs, by way of a special capital appropriation in the annual financial statements, chargeable wholly or in part against the revenue for the year in which incurred, as decided on.

Miners' Phthisis.

You are aware, gentlemen, that the Union Parliament has under consideration a Miners' Phthisis Compensation Bill, which has now been referred to a Select Committee of the House. The Chamber of Mines has made various representations to the Government in connection with the Bill, and delegates of the Chamber were to have given evidence in support yesterday before the Select Committee in Capetown. Seeing that the provisions are in this more or less undecided stage, I do not propose to deal with the subject further to-day. All I wish to observe is that it is generally recognised to be high time that some proper and definite provision was made for the compensation of men who have contracted phthisis on the mines of these fields, and that it is to be hoped a reasonable and workable Act will be the result of the present Parliamentary deliberations.

Distribution of Profits.

You will expect me, before closing my remarks, to give you some idea as to when the first distribution of profits will be made by the company, and what the amount of such distribution is likely to be. The company is to-day entirely out of debt, having repaid the loan contracted to cover the additional capital expenditure incurred over and above the working capital supplied and interest earned, of which full particulars are given in the directors' report. The tonnage treated this month will be fully 48,000 tons, and we venture to anticipate that the profit, exclusive of the reserve gold, will be in the neighbourhood of £30,000, and that with a continuation of the present conditions, we shall be enabled to at least maintain that figure in future months. I quite realise that to prophesy "before one knows" is a risky and often thankless task; but I feel that the circumstances justify me in being confident of the declaration of a dividend at the end of June, and in saying that the dividend is more likely than not to be one of 15 per cent. I qualify this forecast, as it must necessarily be qualified under the circumstances, by stating that its fulfilment is evidently dependent on the profits to be obtained this month and for May and June; but there is absolutely no reason that your directors know of to anticipate any decrease in the results now being secured. I may go even further, and say that I think we may pretty confidently look forward to a somewhat increased distribution at the end of the year; but you must realise that I say this with all due reserve as to possible contingencies. These things in the event are, as always, "on the lap of the gods." I would mention that since the close of the year Mr. H. O'K. Webber's resignation of his seat on the Board of the company, whose interests he has served for some years past, has been accepted with regret, and Mr. E. J. Renaud has been appointed to the vacancy so created. In accordance with the provisions of the articles of association, it will be for you to-day to confirm Mr. Renaud's appointment. There is also a further change, this time in the management, to which I have to make reference. Mr. C. B. Brodigan, who has had charge of the company's mine since the commencement of the work there seven years ago, has retired from the position of manager. Mr. Brodigan has throughout rendered very valuable service to this company and has, as I have had occasion to point out more than once, studied its interests with the greatest energy and zeal. I wish him, on behalf of this company and its directors, the fullest enjoyment of the holiday which he is now taking, and every success in his future career. I may add that Mr. C. R. Davis, the late manager of the Lancaster West, has been appointed manager in the place of Mr. Brodigan, and will take up his duties on the 1st of July next. In the meantime the work is being performed by Mr. C. E. Knecht, our assistant consulting engineer. In conclusion, I am sure you will wish me to convey your hearty appreciation of able work done on behalf of the company to Mr. Honnold, the consulting engineer; to his assistant, Mr. Knecht; to Mr. J. F. Cook, the consulting mechanical engineer; and to the members of the head office and mine staff, who have performed zealous and efficient service. I now have very much pleasure in moving the adoption of the reports and accounts for the year 1911, as submitted to you to-day for your approval.

Prosperity Ahead.

Mr. Charles Marx, in seconding the motion, said: I had the privilege of addressing you last year, when I expressed my confidence that when once the adjustments incidental to the starting of any new plant had been made, the result of our crushing operations would be satisfactory. At the same time I urged on shareholders to exercise a little more patience and not to expect too much the moment we were beginning operations. I am glad to be able to state, that with very few exceptions, shareholders have shown the forbearance I asked for, for which I am sure your directors are thankful. To-day we are looking back with equanimity on a long period of risks, doubts, and sometimes disappointments, which all have now happily ended in success. In doing so, I think I am in order, if I congratulate those who in the early stages had the financing of the concern in their hands. It was a plucky undertaking to guarantee the issue of the working capital of your company at a time when there existed grave doubts about the district in which your mine is located. Still more if you consider that yours was the pioneer deep level of that great district the far East Rand. If you take into consideration the cost of shaft sinking, development, and equipping your mine with a most up-to-date plant has cost about £1,200,000, while the total issued capital is £750,000, and that we are entirely free from debt, you will agree that your financing has been well done. We are now fairly started, and if nothing unforseen happens, there can be no doubt but that there is a long period of prosperity in front of us. The results so far obtained are very satisfactory and most encouraging, and I quite agree with our chairman when he predicts that you may look forward to a dividend of 15 per cent. being declared at the end of June next. I also can, humanly speaking, see no reason why regular, and probably improved dividends may not be continued to be paid in the future. Anyhow, everything points to steady prosperity.

At this point you will allow me to say that I fully endorse what our chairman had said with regard to those to whom we are greatly indebted for the successful start we have made. Our thanks are due to Mr. Honnold, your consulting engineer, for the able way the mine has been laid out and supervised, to Mr. Brodigan, the late manager, for the excellent and at the same time cheap work he has done for us, and to Mr. Cook, your consulting mechanical engineer, for the splendid reduction plant he designed and erected for us. Your chairman has dealt fully with all the details of the accounts, that I am sure you do not expect me to say any more on this score, excepting that I admire his moderation, and the restraint he placed on himself. In conclusion, allow me to state that if we have had sometimes disappointments in the past, such a striking a poor patch when we encountered the reef in No. 1 shaft, which, judging from the excellent development results in the vicinity of that shaft, was only a patch, we have the satisfaction that we practically proved the whole district in which your mine is situated. We also encouraged others to open up new properties in the same area with the result that within a month or two the reef should be struck in some of the shafts of the Modder Deep and the Government Areas, and the Springs Mines should do likewise before the end of the year. Very soon the whole district will be the scene of bustle and activity, and if I say that the future belongs to the far East Rand, I am only stating what is also the opinion of a good many others.

The report and accounts were adopted.

The appointment of Mr. E. J. Renaud as a director in place of Mr. H. O'K. Webber was confirmed.

Messrs. J. G. Hamilton and M. G. Elkan were re-elected directors.

The auditors, Messrs. Thomas Douglas and John Mackillican, were reappointed.

Mr. Alphonse Sprinz asked what was to be done with the reserve gold.

The Chairman stated that the reserve gold would be declared separately at the end of this month, and would represent an amount of between £15,000 and £16,000, to be declared in addition to the anticipated profit of £30,000.

NEW GEDULD DEEP.

The third ordinary general meeting of the New Geduld Deep, Ltd., was held in the office of the company, Exploration Buildings, last week, Mr. J. T. Wliliams presiding.

The Chairman, in moving the adoption of the report and accounts, said: In submitting for your acceptance the directors' report, balance sheet and profit and loss account, there is little calling for special comment. Financially we are better off. We have increased cash on hand by £1,257 14s., and on deposit, namely, from £18,432 13s. 2d. to £19,690 7s. 2d., without increasing your liabilities. This has been due to (a) decrease in London office charges (exclusive of salaries and committee fees) from £302 2s. 5d. to £10 10s. 8d.; (b) reduction of £151 9s. 8d. in the general charges and other expenditure in South Africa; (c) increase of £59 4s. 5d. in the interest received on deposits. The number of stands sold during the year was 41, as compared with 27 in 1910. There is an amount of £1,442 1s. 8d. not yet brought into account for balance due on stands sold on terms, all of which is considered good. This is £142 17s. 7d. more than in 1910. The net result is that the revenue has exceeded expenditure by £1,361 1s. 10d., as compared with an increase of £1,014 3s. 3d. in the previous year. The company continue to avail themselves of every suitable opportunity for selling stands. The Springs district is being gradually improved by the Municipality. Shortly a water supply and an electric light supply will be available for the Geduld township. We hope, therefore, to be able to sell largely in the future, especially when this promising gold mining district approaches the normal rate of gold production. At present most of the neighbouring mines are either shaft sinking, developing or producing on a limited scale. In time, of course, a new company will be formed to work your own claims, together with the unfloated part of the farms Geduld and Springs, when a greater demand for stands in the township will ensue. Naturally you will not expect any news at present as to working your claims. The market for South African mining shares during the year has for several reasons been quite unfavourable to raising new capital. An improvement has recently set in, which may extend, especially if the satisfactory results recently obtained of the small drill for stoping work are maintained and multiplied, so as to overcome the present cost of inefficient and insufficient unskilled labour. Until market conditions are more favourable for raising new capital, the Government is not likely to call for tenders for working the claims. In the meantime, the directors consider it advisable to retain the remaining cash capital to provide against contingencies.

The report and accounts were agreed to.

Messrs. J. T. Williams and J. O. Reid were re-elected to the directorate.

The appointment of Mr. Dundas Simpson to the directorate was confirmed.

Messrs. Thomas Douglas and Alexander Aiken and Carter were reappointed auditors.

TRANSVAAL COAL TRUST.

Coal Rates and the Export Trade

Holdings Reviewed.

The twentieth ordinary meeting of shareholders of the Transvaal Coal Trust Co., Ltd., was held on April 30, in the board room, Corner House, Mr. J. G. Hamilton, M.V.O., presiding. There were 196,617 shares represented out of an issue of 545,760.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: I must preface my remarks by explaining why this meeting is being held at a later date than usual. We have a very large number of European shareholders, and those gentlemen gave expression some couple of months back to a desire that the annual reports and accounts should be in their hands for a sufficient time prior to the holding of the annual general meeting, to give them an opportunity of expressing an opinion at that meeting, should they wish to do so. As a result of these representations, the annual general meeting this year was fixed for to-day, which is the last day permissible in terms of the company's articles of association, and the annual reports were issued both here and in London on the 21st of March. It is proposed to hold an extraordinary general meeting of shareholders before the end of the current year, in order to make such alterations in the provisions of the articles of association as will enable the annual general meetings to be held within five months of the closing of the books, i.e., prior to the 31st of May in any year. The reports and accounts will be circulated both here and in London upon completion and will, as the result of the proposed alterations in the articles if association, be in the hands of all registered shareholders for an ample period prior to their submission for adoption at the annual general meeting.

Year's Output.

As I have just mentioned, the reports and accounts were circulated on the 21st ultimo. These gave you ample details as to the operations, results and prospects of the company, and it will on the face of it be sufficient for me to-day to give you such later information as will place you in possession of anything of importance which has transpired meanwhile. In the first place I will, however, briefly recapitulate the trading results for last year. The output for the twelve months, which amounted to 497,369 tons, showed an increase of 37,596 tons of coal placed upon the market, resulting in an actual trading profit on coal winning of £60,877, as against the figures of the previous year of £56,664, thus showing an improvement on this head of £4,213. After the deduction of the usual administrative charges, the net trading profits gave a total of £51,034, as against £46,206 for the previous year which, in its turn, had shown an increase of £11,215 over the 1909 results. At the end of the year we declared a dividend (No. 24) of 7½ per cent., payable to shareholders registered at the 31st of December last, as against 6¼ per cent. paid out for 1910. The declaration involved a distribution of £40,932, leaving us with an unappropriated credit balance of £7, 767 to carry forward to the current financial period, as against £7,463 the previous year. Later on I shall ask you to adopt a resolution confirming the declaration of the dividend to which I have just referred.

Development Work.

You will have seen from the reports that the remaining life of the De Rietfontein Colliery may be taken as possibly of comparatively short duration. It serves no purpose to speculate to-day as to what the life is likely to be; but your directors are fully alive to the situation, and are taking steps to meet any contingency. For business reasons, which will be readily intelligible to you, I do not propose to detail what is being done at the moment to further strengthen the company's property holdings, but you will be informed in due course as to what may be effected in this direction. Regarding Oogies Colliery the new shaft has been sunk to a depth of 202 feet, and the upper seam of coal where intersected appears to promise satisfactory results. Drives are being put in north and south, the last footage reported recording 85 feet and 88 feet respectively. The lower seam of coal has been recently cut, but it has not been possible to effect any development upon it as yet. As stated in the report, it is imperative to make some further additions to the plant at this colliery during the year, in order that any increased output called for should be capable of ready supply.

Transvaal's Coal Output.

As a matter of general interest I would mention that the total output of coal from the Transvaal last year amounted to 4,343,680 tons, as against 3,970,069 tons in the previous year, being an increase of 373,611 tons. The total tonnage bunkered and exported through Delagoa Bay during 1911 showed at 113,154 tons, or a decrease of 2,063 tons on the figures for the preceding year. I regret to say there has been no reduction in the coastwise coal rates, on which I have commented in previous years, which alone appears to offer any real chance of a decent export trade. The recent coal difficulties in Europe, and particularly in England, may possibly direct more attention to the coaling facilities existing in South African ports; and I am of opinion that if lower coal rates were conceded there would now be a better chance of the development of a profitable export trade than has hitherto been the case. From recent discussions in political circles, I think we may deduce the conclusion that the immense importance of the coal deposits and the coal industry of South Africa is likely to be better recognised in the future than it has been in the past.

Other Important Interests.

I now turn to the other very important interests of your company. Our holdings in Brakpan Mines and in Springs Mines remain as at last year's figures, namely, 253,500 shares in the former and 250,000 in the latter. The annual general meetings of these two companies, at which I have also presided, have been held this morning, and I would ask shareholders to study the reports which, as usual, have been embodied together, with the report of this, the parent. company. From the remarks made by me at the meetings of these companies, it will have been learned that there is every expectation of the Brakpan Mines declaring an interim dividend of 15 per cent. at the end of June. The prospects of the mine are excellent, and the highest hopes are held as to the continuation of, and even an improvement in, the success so far experienced in its reduction operations. Regarding Springs Mines, this company, as you know, is in the shaft-sinking stage. It is expected that the reef will be intersected in its north shaft before the end of the current year, and your attention is directed to the very favourable developments now taking place. especially at depth, on the Geduld Proprietary Mines, on the dip of which the property of the Springs Mines lie

Brakpan Township.

Another matter with which I have to deal is the Brakpan Township, to which I referred at some length in my speech last year. In the first place I would like to give you the exact figures regarding the stands which, after survey, numbered 3,213 in place of 3,200, as originally estimated, and to inform you that the number of stands situated on the reserve is a little less than estimated, namely 463 in place of 483. It was stated in the annual report when issued that the necessary, if somewhat protracted, formalities had then been complied with, and that it was expected the preliminary sale of stands would take place last month. As a matter of fact, it was late in the month of March, i.e., on the 26th of that month, when the final approval of the Minister of Lands appeared in the Union "Gazette." The preliminary auction sale held on the 16th instant resulted, I am glad to say, in a very satisfactory and promising manner, and gave us a good indication as to the approximate value put by the public on the stands in the township. Up to yesterday, including the sales at the public auction and stands since purchased by private treary, we have disposed of 125 business stands and 22 residential stands, for a total sale price of £29,231. These stands have been disposed of on usual terms, namely, 10 per cent. cash, and the payment of the remainder of the purchase price by regular instalments, the balance carrying six per cent. interest on the amount outstanding, transfer being given against the final payment. So far we have received on account the appreciable sum of £4,764 5s. The business of a large township, with its varied details of management, including the collection of instalments of payment, is one requiring very careful handling, and your directors have, in consequence, considered it advisable to place the affairs of the Brakpan Township in the hands of the Estate Department of the Consolidated Mines Selection Company, Limited. That company will carry out the whole of the arrangements in connection with the township, and will in due course make monthly settlements with this company.

Railway Alterations.

Before leaving the subject I might. in reminding you that one cannot make omelettes without breaking eggs, inform you that it was found necessary when establishing the township to make arrangements with the railway administration and the Rand Collieries for the removal of the siding connection of the latter from Schapenrust Station, which is to be scrapped, to the new Brakpan Station situated on the township, and also for deviating the Victoria Falls Power Company's line to the Rand Collieries, the cost of both alterations having to be defrayed by us. In addition the costs of survey were ventured; but your directors are pleased to realise that the expenditure so incurred has been very much more than justified even by the preliminary results. I might mention that the new railway station at Brakpan was opened for traffic on the 22nd instant. I gave you last year my impressions as to the promising outlook for the Brakpan township. These have been strengthened by the events of the past, and the prospects of the present year, which cannot fail to impress us with the idea that the future of the Rand lies at its eastern extension.

Dividend Prospects.

You will naturally expect me before concluding to give you some idea as to the dividend prospects for this year. I have just stated at the annual general meeting of the Brakpan Mines that it was expected that company would, in all probability distribute an interim dividend of 15 per cent., at the end of June, and quite possibly a slightly increased dividend at the end of December. If the former forecast is realised our holding in that company, supplemented by our own profits, will justify us in declaring an interim dividend of 7½ per cent. for the first half of this year, leaving us with the usual satisfactory amount of cash in hand, which I confess I always like for business reasons to have at disposal in a commercial venture. It is also quite 'on the cards' we shall be in a position similiar to the Brakpan Mines in the matter of an increased final dividend at the end of the year. Since the close of the year Mr. H. O'K. Webber vacated his seat on the board, his resignation having been received with regret and with acknowledgments for past services to this company. Mr F. Robellaz has been elected to the directorate to fill the vacancy so created, and his appointment must come before you to-day for confirmation in accordance with the provisions of the company's articles. It now remains but for me to express our appreciation of the able services rendered by our consulting engineer, Mr. Honnold, and by his assistant, Mr. Knecht; as well as of the good work done by our colliery managers, Messrs. E. Williams and J. K. Addie, and their respective staffs; and the staff of the head office, including our business manager, Mr. H. L. Morris. I think, gentlemen, I have given you pretty full particulars of everything of immediate interest, and I have now very much pleasure in congratulating shareholders on the results, and in moving the adoption of the reports and accounts for the year 1911.

OPTIMISM JUSTIFIED.

Mr. F. Elkan, in seconding the motion, stated: I have no doubt that shareholders will be gratified to hear that an interim dividend of 7½ per cent., per end of June, is well within view, and that an increased amount is likely to be returned to them at the end of the present financial year. A year ago I pointed out how fortunate shareholders in the Transvaal Coal Trust were, in my opinion, and I think events which have occurred since then have fully borne out my optimism. The Brakpan Mines, in which we hold such an important holding, has started, almost from the beginning, to make those profits which shareholders were always led to expect. The Springs Mines is nearing the first stage of its existence. The coal trade has been better, and the township is at last not only a paper asset but a realisable one. You know, sir, that I represent in this company a large body of Continental shareholders. Now, of late, much has been said and written about the dissatisfaction of Continental shareholders with the management of companies on these fields. None of these criticisms, however, has applied to the Transvaal Coal Trust Company, and its children, the Brakpan and Springs. All the correspondence I get always expresses the great satisfaction with the way in which these companies are managed, and from the tone of my communications it is evident to me that the Continental shareholders of this company fully appreciate the efforts of the board. Needless to say that we here know that most of that successful work is either due to the chairman's initiative or to the untiring interest which he takes in the affairs of the Transvaal Coal Trust, and I am glad, on behalf of those whom I have the pleasure to represent at this meeting, to express to Mr. Hamilton and the board their thanks for the results achieved. May I be permitted, at the same time, to express the hope that the same success will accompany us in the future.

The report and accounts were adopted.

The appointment of Mr. F. Robellaz as a director in place of Mr. H. O'K. Webber was confirmed, and the declaration of the dividend of 7½ per cent. was also confirmed.

Messrs. F. R. Lynch and J. G. Hamilton were re-elected directors.

The auditors, Messrs. C. L. Andersson and Alex. Aiken, were reappointed.

KLERKSDORP PROPRIETARY

Main Reef West Interests.

The fourteenth ordinary general meeting of the shareholders in the Klerksdorp Proprietary Mines was held last week at the office, 107 Exploration Buildings. There were present Messrs. D. Symons (chairman), J. Fraser, W. P. Fisher, F. N. Hyman, J. O. Reid, G. C. Herbert, J. H. Manisty and G. M. Pemberton, secretary

The Chairman'sSpeech.

The Chairman said: Gentlemen, in moving the adoption of the report and accounts, I have to express the regret of the board at the inability to pay a dividend this year owing to the large amount it was deemed advisable to set aside to meet any losses that might be incurred in respect to the depreciation on the company's shareholdings. At the same time it is a matter of congratulation that we were able to make this provision out of the profits made during the year, and still show a balance at credit of profit and loss account on the year's work. This provision for depreciation, it is only right to explain, has been made on the basis of the share prices ruling at the 31st December last., since which date several of the holdings have materially appreciated in price. In the case of your holdings in Main Reef West shares and debentures, though the shares have figured in your books for years at 25s. your directors became somewhat alarmed at the very heavy fall that has taken place in the market price of these shares since January of last year, when the shares stood at 47s. After serious consideration your Board deemed it advisable in your intests to have an independent report made on the mine. This, after some correspondence, the Board of theMain Reef West, Ltd., gave permission for, whereupon your Board engaged the services of Mr. Creswell, who spent some seven weeks in making a most exhaustive report of the mine and plant. The report, we are pleased to say, is in every way satisfactory—fully corroborating the reports issued by the consulting engineer and manager of the Main Reef West, Ltd. Copy of the report, I may state, was submitted to the board of the Main Reef West, Limited, in the hope that some of the suggestions contained therein might be accepted by them. The fall in the price of these shares cannot, I am satisfied, be attributed to any depreciation in the values of the mine. The cause, therefore, has to be looked for elsewhere, and it has been suggested that, outside the depreciation experienced by all shares during the past years, a probable cause was the persistent rumours in circulation as to an amalgamation between the Main Reef West, Limited, and the Consolidated Main Reef Mines and Estates, Limited. I am assured, however, by the chairman of both of these companies that such an amalgamation is not contemplated, and that with a sufficiency of labour we look forward with confidence to a marked improvement in the profits made by this company from now onward—a result which should speedily manifest itself in increased dividends and enhanced prices for the shares. In conclusion, your Board have adopted the principle of having on hand a large amount of cash with its bankers, which is always available when any sound and prifitable business presents itself. I now formally move the adoption of the report and accounts.

Falling Off in Profits.

Mr. Fischer, in seconding the adoption of the balance sheet and report, said that in conjunction with the chairman he had noted with certain feelings of misgiving the falling off in the profits of their principal holding, which was largely represented by shares and debentures in Main Reef West, Ltd. They would observe that in October, 1909, the profits of that company were £11,015. He had not the exact figures with him but, syncronising with that profit it was fair to assume that the market value of the shares at that particular time was somewhere in the neighbourhood of 70s. From the month of October, 1909, to the month of February, 1912, there had been a persistent falling off in the profits and at the time of latest valuable data, February 7th, the profits had fallen to £7,485. As had been stated by the chairman, there was a suspicion that there may have been some ulterior motive to be served by this depreciation, and their chairman had told them that he was apprehensive of the possibility of a scheme of amalgamation between the Main Reef West and the adjoining property. However, the chairman had assured the directors that at various meetings of the Main Reef West which he had attended he had raised the question, and he was assured that no such proposition was intended. As the outcome of the fears which they had entertained they had asked Mr. Creswell, a gentleman of the highest integrity on the Rand, and who could not in any way be accused of being sympathetic with the ruling powers in Johannesburg, to make a report, and it was only fair to say that the directors of the Main Reef West, Ltd., had responded in the most courteous manner. Mr. Creswell had made an exhaustive examination, and his report was to the effect that the position of the Main Reef West to-day was practically as good, if not better, than it had been at any previous time in the company's history. They were assured by the controlling powers of the Main Reef West, Ltd. that the falling off in the profits of the company was more or less entirely due to the insufficient and inefficient supply of native labour. He thought that a more substantial explanation than that should be given. The report of Mr. Creswell had been endorsed by the report of the consulting engineer of the Main Reef West, and he (Mr. Fisher) hoped that they could look forward to the reversion of profits to their former scale in the immediate future. The prospectors of the company were exceedingly good.

The motion was carried unanimously.

Messrs. David Symons, W. P. Fisher, J. O. Reid, James Fraser, J. Creemel, B. M. Ries, A. Moses, and F. Burch were re-elected directors, and Messrs. J. Moon and J. H. Rainier were reappointed auditors.

SPRINGS MINES, LIMITED.

Shaft Sinking Progress.

Favourable Outlook.

The third ordinary general meeting of shareholders of the Spring Mines, Limited was held at 11.15 o'clock on April 30 in the board-room, Corner House. Mr. J. G. Hamilton presided, and there were also present Messrs. M. G. Elkan, F. Elkan, C. Marx, W. H. Dawe, F. R. Lynch, H. Neuhaus, W. H. B. Frank, G. R. Airth, A. S. Pearse, H. Daniel, B. Koenigsbert, and G. Sonn, representing 485.558 shares out of an issue of 630.000.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: It was the intention to have held this meeting before the end of last month, but, in deference to the expressed views of large shareholders in Europe, a postponement to this date was decided on. The annual reports and accounts were circulated among shareholders here and in Europe on the 21st ultimo, sufficient time being thus given to enable representations to be received from European shareholders. It is the intention, however, to effect such alterations in the company's articles of association as will enable the annual meetings to be held within five months of the closing of the books, instead of four months, as now, i.e., up to the end of May, in place of the end of April, and to issue the reports and accounts here and in London as soon as possible after their preparation, so as to give ample time for their study prior to the holding of the meetings. It will as a consequence be necessary to convene an extraordinary general meeting of the company before the end of this year, at which it will be proposed to adopt the alterations in the articles of association necessary for this purpose. The annual report of the company, which has now been in your hands for some time, places you in full possession of the position at the end of last year, and it only remains for me to supplement the information given therein by furnishing you with a summary of what has taken place in the meantime.

Sinking Costs.

The March quarterly report intimated that the north shaft had, at the end of last month, been sunk to a total depth of 2,035 feet, of which 1,990 feet had been timbered, whilst the south shaft had then been put down to a depth of 1,637 feet, of which 1,593 feet had been timbered. The reports of the consulting engineer and the manager explained the reasons for the high costs of sinking in both shafts, which costs were, however, capable of reduction towards the end of the year, and showed the following figures in respect of the quarter to the 31st ultimo, viz., north shaft, £32 14s. per foot for the 463 feet accomplished; and south shaft, £37 3s. per foot for the 336 feet made. The actual present depths, according to yesterday's measurements, are 2,211 feet in the north shaft, and 1,742 feet in the south shaft. I am glad to be able to inform you that the unskilled labour supply, to a shortage in which towards the end of last year reference is made in the reports, is now up to our full requirements.

Excess Water Income.

The arrangements with the Rand Water Board for the disposal of water has resulted in that Board having taken from us for the period from the 15th December last to the 31st ultimo, a quantity of 102,700,700 gallons of water, whereby we have earned the sum of £1,115 12s. 8d. for water from our shafts, which would otherwise have run to waste. The agreement entered into with the Rand Water Board continues to the 31st March, 1917, and under certain circumstances, is to be further extended; but the arrangement naturally applies only to surplus water, i.e., water not required by the company for its own use. The Water Board has the right to take, under the agreement, up to 2,250,000 gallons per twenty-four hours, and must pay, as from the 1st instant, for a minimum of 1,000,000 gallons per diem. You will be aware of the present terms of the Miners' Phthisis Compensation Bill, which has been referred to a Select Committee by the Union Parliament. Seeing that the measure is now under consideration, I do not propose to do more than make this reference to it to-day, and to state that your directors, in common with others holding similar positions of responsibility, are anxious that a reasonable law providing for the compensation of sufferers from miners' phthisis for the adoption of measures towards its alleviation and, if possible, final eradication, should be placed on the Statute Book.

Reef Anticipation.

I mentioned last year that, if we were to experience no unexpected difficulties meantime, we should intersect the reef series before the end of the present year, and I can tell you that it is still considered this result will be attained within the time mentioned in the north shaft. It is not expected, however, that the reef will be cut in the south shaft until the earlier months of next year. As I have stated at previous annual meetings, the indications we have as to the value of our reef when opened up are confined, in the first instance, to the assay values obtained from the borehole cores, and in the second instance, to the developments which are taking place upon the Geduld Proprietary Mines, upon the dip of which this company's ground lies. It might be as well to remind you that the values obtained from the borehole cores, as given in the directors' report for the year 1909, were as follows:—Borehole No. 1, 28.42dwts. over a width of 18.56 inches; borehole No. 2, 21.42dwts over a width of 10.81 inches. By the courtesy of Mr. M. G. Elkan, the chairman of the Geduld Proprietary Mines, who is also a director of this company, I am in a position to tell you that developments at depth on that property are most encouraging. On No. 2 level, being driven at a vertical depth from surface of 1,825 feet, and situated 3,240 feet east of the No. 2, vertical shaft, 1,330 feet of development have been sampled out of 1,402 feet driven, and have given the satisfactory average value of 9.12 dwts. over a milling width of 40 inches.

Financial Position.

It is somewhat difficult to give reliable figures to-day as to what the actual financial position of the company will be when the shafts are down to the reef. At the same time you will naturally desire to get some general idea on the subject, and I can tell you it is estimated that, barring any unforeseen adverse occurrences, we should have some £50,000 left with which to start the development of the mine after sinking costs of both shafts shall have been defrayed. The option of the second block of 165,000 shares at the price of 40s per share falls due on the last day of the present year; but I have some natural diffidence, at any rate, in the present condition of the market in anticipating that this option may be exercised. In conclusion, I have to bring to your notice that our acknowledgments are due to our consulting engineer, Mr Honnold, and to Mr. Bushell, our manager, and his staff, for their able services. I now beg to move the adoption of the reports and accounts, as submitted, for the year to the 31st of December, 1911.

Mr. M. G. Elkan.

Mr. M. G. Elkan, in seconding the motion, said: It gives me great pleasure to notice the good progress made during the past year. While at the end of 1910 the north and south shafts had reached the respective depths of 583 and 646 feet, their depths at the end of 1911 were 1,572 and 1,301 feet respectively, making the total footage sunk during the past year 1,644 feet—a very creditable performance when you bear in mind the considerable water troubles we experienced. Moreover, the cutting of the pump chambers proved to be a far bigger piece of work than anticipated, and with the limited supply of native labour at our disposal, the shaft sinking operations had to be curtailed somewhat until the former task, as well as the cutting of the sumps, was completed. Finally, we were also held up in consequence of the pumping plant being delivered late. However, now that the pumps are installed and are working very satisfactorily, excellent progress is being made, as appears from the figures just quoted by the chairman, and I can only express the hope that no further troubles will be met with, in which case I feel confident that before this year runs out we will have struck the reef measures in the north shaft anyhow, and will not have to wait many months before intersecting them in the south shaft too. The chairman, in his remarks, referred to recent development in the Geduld Proprietary Mines, and I as chairman of that company can but emphasise what he stated. The recent disclosures at the Geduld are very encouraging—Mr. Hamilton quoted some figures just now, and while confirming them, in fact he informed you that he obtained them from me, I wish to add that they relate to the results obtained in the deepest workings of the Geduld, but there have been numerous other very encouraging developments of late in other parts of that mine. Seeing that the Springs Mines' property is to some extent the deep level of the Geduld Proprietary Mines, I think those results augur well for what we may expect when we get to the reef.

The report and accounts were adopted.

Messrs. M. G. Elkan and F. Elkan were re-elected directors, and Messrs. A. E. Page and F. W. Diamond were reappointed auditors.

NEW ERA CONSOLIDATED.

The Market Position.

Important Shareholdings.

The tenth ordinary general meeting of shareholders of the New Era Consolidated, Ltd., was held on Tuesday, at 10.30 a.m. in the company's board room, Corner House. Mr. J. G. Hamilton, M.V.O., presided, and there were also present Messrs. G. Sonn, C. Davies, H. Daniel, B. Koenigsbert, A. S. Pearse, and G. B. Metcalf, representing 62,803 shares out of an issue of 400,000.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: I have to explain, in the first instance, the reason for holding the annual general meeting of this company at a later date than usual. The first date fixed was the 29th of March, but in view of representations received from European shareholders, it was decided to postpone the meeting until to-day's date. You will be aware that a very general feeling exists that the reports and accounts of Transvaal companies should be in the hands of their European shareholders sufficiently long before the holding of the annual meetings to enable representations to be made on their behalf, if thought advisable, at such meetings. The Board proposes to call an extraordinary general meeting of shareholders before the end of this year, in order that such alterations may be made in the articles of association of the company as will enable future annual general meetings to be held somewhere about the end of May.

Last Year's Operations.

The reports and accounts, which were circulated both here and in Europe on the 22nd ultimo, informed you of the results of last year's operations. The South African market position, as you know, continued throughout of an unfavourable nature; and I regret to say that it was not found possible to earn the usual dividend, the business of the year resulting in a realised deficit of £1,624 13s. 11d. In addition, it was found advisable to increase the amount of the provision previously instituted in respect of certain holdings, in order to meet the lower market valuation at the end of the year, to £27,902 13s. 7d., as will be seen from the financial statements submitted. I would, however, remind you of the statement in the report that the actual market valuation of the whole of the company's shareholdings at the 31st of December amounted to £131,023 14s. 3d., against the book value of £103,684 1s. 6d., as shown in the balance-sheet. I am pleased now to be able to say that the present somewhat better financial tone has further increased the market valuation of these holdings to an amount of £157,757, chiefly through the recent improvement in the quotations for Brakpan Mines, City Deep and Transvaal Coal Trust. A complete list of the shareholdings of the company is, as usual, given in the directors' report, from which such changes as have been made during the year will readily be seen. I might add that so far this year it has not been thought advisable to further vary these holdings, with the exception that we have just sold some shares we bought for a turnover at a decent profit, and that on the reconstruction of the Van Deep, Limited, the 3,800 shares in the old company were exchanged for 1,520 in the new company, being in the proportion of two new for every five old shares.

Brakpan Mines.

Our largest shareholdings remains in Brakpan Mines, Limited, where very favourable results have been obtained since the commencement of reduction operations at the end of May last. I would refer you to the very full reports of that company, as well as to those of the Transvaal Coal Trust and the Springs Mines, which are lying on the table, for all particulars of the present position of those concerns. I may tell you it is confidently anticipated that the Brakpan Mines will declare its first dividend at the end of June. If that anticipation is verified, then the Transvaal Coal Trust will, as a consequence of its large Brakpan Mines holding, also declare an interim half-yearly dividend at the same time. At the Springs Mines the reef is expected to be intersected in the north shaft before the end of this year. You will doubtless be already acquainted with the details of the reports of the other companies in which we are interested, most if not all of which have been already made public. In regard to the property holdings of the company, I can only repeat, I am sorry to say, what I reported this time last year, to the effect that there has been no opportunity of dealing with any of our remaining mining ground, either in connection with new flotations or the readjustment of the boundaries of neighbouring deep level companies. The want of enterprise in this direction is no doubt mainly owing to the present regrettable, though I venture to hope temporary, general lethargic attitude adopted towards mining possibilities in this part of the world. Reference is made in the report to an arrangement with the Klippoortje Estate Company, Limited, under which this company is to receive an interest of 25 per cent. of such proportion of the proposed Klippoortje Township area as this company's claimholding bears in relation to the whole of the claims to be covered by the Township. It has been estimated that the number of stands proposed to be situated on the ground of this company will be some eight hundred, each in extent 100 feet by 200 feet. I might mention that your directors have only agreed to the establishment of this township on the express condition of an assurance being obtained from the Government, in writing, to the effect that its institution will in no way interfere with our existing mining titles. I now beg to move the adoption of the report and accounts for the year ended the 31st of December, 1911.

Mr. Clement Davies, in seconding the motion, stated: The position of this company has certainly greatly improved since the close of the financial year; the investments stand in the books at £103,684; to-day they are worth approximately £158,000, a surplus of £54,000, against £28,000 provided to meet lower market valuations in certain of our stocks on 31st December last. This, I am sure, you will all agree is quite satisfactory. In addition to this, I understand we shall probably from now on receive good dividends from our large holding in the Brakpan Mines, which, coupled with the improvement in other of our investments, should enable the Board to resume the payment of yearly dividends from the end of this year.

The report and accounts were adopted.

The meeting confirmed the appointment of Mr. C. H. Mullins, V.C., C.M.G., as a director in place of Baron R. Kellersperg, resigned.

Messrs F. R. Lynch and W. McCallum, retiring directors, were re-elected.

The auditors, Messrs. E. Broom and A. E. Page, were reappointed.

NEW GOCH.

Increased Working Costs.

Improved Labour Conditions.

The annual meeting of the New Goch Gold Mines, Limited, was held on Thursday in the Board room, General Mining Buildings. Sir George Albu presided, and the other shareholders present were: Messrs. E. Elkan, A. French, W. H. Betz, A. Rosendorff, W. P. C. Hastie, and the secretary, J. V. Blinkhorn.

Chairman's Speech.

The Chairman, Sir George Albu, Bart., in moving the adoption of the reports and accounts, said: On this occasion the annual meeting of your company is being held later in the year than has hitherto been the custom, but I think you will agree that the delay in bringing you together is more than compensated for by the issue of the annual accounts and reports to shareholders some seven or eight weeks before the date of the meeting. This innovation (which applied to all the mines under the control of the General Mining and Finance Corporation, Ltd.), has been under consideration by us for some time past, and we have now definitely decided to carry on the new practice in each future year also, with the view that shareholders both here and in Europe, before forwarding their proxies for the meeting, shall have ample time in which to digest the accounts and the directors' report on the operations of the company for the previous financial year.

Increased Working Costs.

A comparison of the accounts before you with those for 1910 shows that, notwithstanding the treatment of 8,241 tons of ore in excess of that for the previous year, the working profit for the past year is lower by £14,223. This decrease is not due to a fall in grade, as the average recovery value for the year under review was 24s. 1d. per ton, as compared with 23s. 7d. for 1910, but is owing to the increase in working costs from 15s. 3d. in the previous year to 16s. 9d. per ton for the past financial year. The appreciable rise in working expenditure occurs for the most part under the heading of "mining," which was 7d. per ton mined (or 1s. 9d. per ton milled) in excess of the corresponding cost of the ore raised during the year 1910; this is attributed by the manager to the increased scale of wages now being paid to natives as the result of the shortage experienced for some time past, and the consequent severe competition between the mines for this class of labour. Your mine was adversely affected, not only by the extra cost of native labour, but also by the shortage, and, as we were naturally loth to curtail milling operations, development work was necessarily diminished—with the disappointing consequences which have been experienced during the last few months and to which I will refer presently.

Ore Reserves.

Notwithstanding the restriction of development, the ore reserves at the close of the year amounted to 894,632 tons of an estimated value of 5.17 dwts. per ton over an average width of 63 inches—an increase of 152,941 tons in quantity and a slight decrease of 0.17 dwt. in value as compared with the reserves at the end of 1910.

Gross Profits.

Turning for a moment or two to the profit and loss account, it will be observed that the gross profit for the year was £128,404, which, with the credit balance brought forward from 1910 of £3,301, gave a total available balance of £131,705. Of this amount, £33,670 was absorbed by the service of the debentures (the principal sum of which has been reduced to £184,425), £10,372 has been paid out as profits tax, and £499 for French taxes, £1,925 was written off stores in respect of depreciation, and £5,807 was appropriated for the capital expenditure during the year on machinery, plant, and buildings. Two dividends, making together 12½ per cent. for the year on the issued capital of the company, have been paid out, accounting for £68,750 of the remaining profit, and the balance of £10,681 has been carried forward.

With regard to the results obtained since the beginning of the current year, which have shown such a severe drop from the previous level of profits, I am fully conscious that these must have been viewed with some alarm by shareholders. I have already mentioned that the labour shortage necessitated the curtailment of the scope of development work which had been previously laid down, but we nevertheless still hoped that normal mining operations could be carried on and the standard of profits maintained until such time as an increased supply of native labour would permit of a considerably augmented rate of development. Towards the end of the year, however, the average grade of the stopes under attack fell below the recovery value previously obtained, and this disappointing feature was still more emphasised in February and March of this year. Of course, it is quite usual for stope faces to vary in assay value from one month to another, but as a general rule the decrease in the instance of those stopes which show a lower value is more or less balanced by an improvement in others; therefore, one does not anticipate a general all-round fall such as was experienced in this case. This is where the lack of development was so severely felt; had it been possible during the past year to devote more work to opening up additional levels and connecting them up at a sufficient number of points, we should have been able to open out new stopes of average value, and so maintain the normal tonage and grade of the ore sent to the mill. The ore developed since the commencement of this year, however, indicates a value of at least 1 dwt. per ton above the average value of the ore reserves at the 31st December last, which is a very encouraging factor. In view of the unfortunate results which have attended the restriction of development work, a vigorous policy was initiated early this year, having for its object the sinking of the main incline shaft to the southern boundary of the property and the opening up of the intervening ground with all possible energy and rapidity.

Improved Labour Conditions.

Fortunately we were able to obtain an increase to our native labour supply in February and March, which will appreciably assist in carrying out this policy. I would ask you to bear in mind, however, that a great deal of work is still required in making the necessary connections, and in completing stations, ore bins, etc., underground, before we shall be in the position to commence stoping operations in the higher grade ground, and that, therefore, the improvement in output and profits (which I very confidently anticipate) will be somewhat gradual. As illustrating that we are actively carrying out the larger development policy, I may say that the quantity of ore developed during the current year is well in excess of the tonnage milled during the same period. As you will probably have gathered from the foregoing remarks, I do not view the future prospects of your property with any anxiety. We have lately experienced a rather marked setback, the after effects of which may be felt to some extent for a little time to come, but now that we have started on the extended scope of development work, I feel sure that the worst is behind us, and that we can look forward to a steady, though gradual recovery in outputs and profits. Since the close of the financial year Mr. E. H. Bulman has resigned the managership of your mine, and has been succeeded by Mr. G. G. Holmes, who will, I am confident, carry out his duties to our entire satisfaction.

The reports and balance sheet were unanimously adopted.

The retiring directors, Messrs. L. Albu and J. Freudenthal, were re-elected, and Mr. Thomas Douglas was appointed auditor.

MEYER AND CHARLTON.

Steady Progress.

New Construction Work.

The ordinary general meeting of shareholders of the Meyer and Charlton Gold Mining Co., Limited, was held on Thursday in the board room, General Mining Buildings. Sir George Albu presided and there were also present: Messrs. Arthur French, H. Daniel, A. Sprinz, A. Rosendorff, H. W. Dalton, W. P. C. Hastie and P. R. Davis.

The Chairman, Sir George Albu, Bart., in moving the adoption of the report and accounts, said: On this occasion the annual meeting of your company is being held later in the year than has hitherto been the custom, but I think you will agree that the delay in bringing you together is more than compensated for by the issue of the annual accounts and reports to shareholders some seven or eight weeks before the date of the meeting. This innovation—which applies to all the mines under the control of the General Mining and Finance Corporation, Ltd.—has been under consideration by us for some time past, and we have now definitely decided to carry on the new practice in each future year also, with the view that shareholders, both here and in Europe, before forwarding their proxies for the meeting, shall have ample time in which to digest the accounts and the directors' report on the operations of the company for the previous financial year.

Working Profit.

Dealing with the annual statements before you, the working profit for the past year, together with sundry revenue, amounted to £99,258, as compared with £112,925 for the previous year, or an apparent shortfall of £13,667; in reality, however, the actual rate of profits earned during last year was really higher than the profit and loss account itself would indicate, inasmuch as the revenue earned represents a period of rather less than nine months' work only, by reason of the suspension of production from the 27th of February to the 3rd of June, to allow of the renovation of the mill and the new construction work as foreshadowed in my remarks at the previous annual meeting. As a consequence the average running time of the mill and the tonnage crushed for the past financial year only amounted to 247.7 days and 117,154 tons respectively, as compared with 333.8 days and 153,717 tons for the year 1910. On the other hand, the average yield for the past year, at 35s. 2d. per ton, shows an increase of 2s. 2d. on the average recovery for the previous twelve months.

Steady Progression.

As a matter of fact the results for the last six months of 1911 show that both the recovery value and the working profit rose in a steady progression from 32s. 1d. per ton and £9,311 profit for July to a yield of 37s. 3d. per ton and £14,008 profit in December. As a result of these excellent returns, my prediction, made at the last annual meeting of the company, that the important new construction work then in hand would be completed, and the full normal dividend of 40 per cent. for the year paid, notwithstanding the suspension of milling operations for rather more than one-third of the period, has been completely justified, and, in addition, as shown in the directors' report, the excess of liquid assets, after providing for all liabilities, including dividend, at the 31st December last, amounted to £26,590.

High Grade Ore Reserves.

The higher figures of recovery value and profit per ton now being earned are due, of course, to the excellent values which have been disclosed in the development of the ground recently acquired by the company. As illustrating the high grade of the ore, and the better conditions for mining and development afforded by the new mine, I may point to the fact that notwithstanding that it was impossible to continue shaft sinking during the greater portion of the year, owing to the stripping operations for the enlargement of the shaft, the ore reserves at the 31st December last, amounting to 312,336 milling tons of an average value of 10.099 dwts—the whole of which stand in the balance sheet free of cost, having been paid out of past profits—show an augmentation of 63,010 tons in quantity, and close upon 1½ dwt. in value, over the reserves at the end of the previous year. As further instancing the high value of the ore contents of the new claims, reference to the manager's report shows that during the year under review 191,066 mine tons of payable ore were developed, with an average assay value of 11.13 dwts. per ton, or 3.3 dwts. per ton higher than the average value of ore reserves existing at the 31st December, 1910. I should also like to call attention to the fact that though approximately 40 per cent. of the tonnage exposed by the development last year was on Main Reef leader, which is easily the richest ore body in the mine, the quantity of leader crushed during the same period only represented about 24 per cent. of the total tonnage treated.

The average yield of 35s. 2d. per ton last year is so appreciably in excess of the average recovery value of the mines of the Witwatersrand for the same period that it is perhaps just as well that I should draw attention to the fact that not only is this grade amply justified by the value of the ore reserves on hand, but that the latter, of an average value of over 10 dwts. per ton, coupled with the reference to the comparatively small proportion of Main Reef leader crushed which I have just previously made, indicate that so far from having milled an undue proportion of high grade rock, we have really erred on the other side, and this is borne out by the returns from the mine for the three months ended 31st March of this year, and which, as a matter of some interest, I may recapitulate. The recovery from January was 38s. 9d. per ton, with a profit of £14,991; for February the yield was 40s. 3d. per ton and the profit £14,385; and for March 41s. 9d. per ton recovery and a working profit of no less than £17,094. As regards the development effected during the last four months, it is a difficult matter to compile definitely the tonnage and value of ore opened up month by month, but I am in the happy position to be able to state that our development operations so far this year have disclosed ore of at least as high average value as the ore reserves at the 31st December last.

New Construction Work.

The whole of the new construction work to which I referred at the previous annual meeting of your company, was completed during the past year, including the enlargement of the shaft from three to five compartments, and its re-equipment on a thoroughly workmanlike and permanent basis, the erection of a new steel headgear in place of the old wooden structure, the installation of a new 5-ton electric hoist and a 40-drill electric compressor plant, the conversion of the steam hauling engine into a 3-ton electric hoist, and the erection of an entirely new sorting station. Moreover, during the three months' stoppage in the first half of last year the mill was thoroughly overhauled and to all intents and purposes renewed. The whole of the plant and machinery is now run on purchased electrical power.

In the foregoing remarks I have laid particular stress on the excellent values disclosed by the development operations in the new ground up to the present, because, after all, this is a factor which has a most important bearing on the future of your company. I have also illustrated, by a reference to the actual milling operations for the past year, and for the three completed months of the current year, that the mine values are being fully confirmed by the yield from the ore treated in the reduction works. The only other essentials for success are that the property should be well equipped and economically worked; in respect of the first of these, I have already referred to the important construction work effected during the past year—which is indicated by the capital expenditure for 1911, as shown in the balance sheet, amounting to £71,897,—and as regards the second, I think I can with confidence point to the results obtained from the mine since the resumption of active operations in the beginning of June last.

Future Prospects Bright.

I have on the occasion of the last two or three annual meetings given what may possibly have been then considered by some of you as optimistic views of the potentialities of your property, but I feel confident you will all agree that the position of the mine to-day is excellent, and its future prospects are so bright as to more than justify everything I have said and predicted on those occasions.

Your manager, Mr. H. G. Nitch, was granted leave of absence for a well-earned holiday of six months in December last, and I have great pleasure in recording the high appreciation of the board of the services rendered by this gentleman. During his absence in Europe, Mr. D. T. Morton has been placed in charge of the mine, and our thanks are also due to him for the competent manner in which he is fulfilling his duties.

The report and accounts were adopted.

Messrs. George Nathan and Arthur French, retiring directors, were re-elected.

The auditors, Messrs. T. R. Haddon and J. P. O'Reilly, were reappointed.

WEST RAND CONSOLIDATED.

Development Handicapped.

Future Plans Outlined.

The annual meeting of shareholders of the West Rand Consolidated Mines, Ltd., was held on Thursday in the board room, General Mining Buildings.

The Chairman, Sir George Albu, Bart., in moving the adoption of the report and accounts, said: The report and accounts for the past year do not reflect such satisfactory results as I hoped to be able to present to you when addressing you on the occasion of the previous annual meeting. The old bugbear of the shortage of native labour has been severely felt on this mine for practically the whole of the year under review, and this was intensified by the increased cost of both recruiting and wages of this class of labour, owing to the competition which prevailed. These difficulties unfavourably affected not only the mining and milling operations for the period, but also to a large extent the excess-development policy which had been formulated for the opening up of the different sections of the property and the rapid augmentation of the ore reserves, with a view to a subsequent substantial increase of the milling capacity. As regards the first mentioned point, the effect is illustrated by the fact that, although the average grade for the past year shows a slight increase over the previous year's figures, the milling of over 77,000 tons of additional ore resulted in an extra profit of about £10,000 only; the usual consequence of an increased tonnage is a reduction in the pre-existing average cost per ton of ore treated, but, as a matter of fact, our working expenditure was 3d. per ton higher than the previous year. But the most regrettable aspect of the dearth of native labour was its prejudicial effect on development operations.

Labour Shortage.

We were placed in the unenviable position, experienced during the last year or two by many other mines of the Rand, of having an entirely insufficient supply of labour to carry on effective and economical mining operations and at the same time to maintain a vigorous policy of development. One of these two policies had to suffer, and having regard to the alarming effect on the minds of shareholders which we felt would follow the serious curtailment of milling in such a time of depression as prevailed, we decided that the scope of development which had been previously laid down must be decreased until a larger complement of labour should be forthcoming. Development operations were confined mainly to the Rand Shaft section (Battery Reef) and to the East Shaft section (Main Reef). Although the work done in the former section (Rand Shaft) disclosed better values than we had anticipated, a large proportion of the ground exposed by the drives in the East Shaft section gave very low values on sampling.

Ore Reserves.

As a consequence of these results, and of the necessarily limited scale of development work practicable, the fully developed payable ore results of 1,114,000 tons at the close of the year showed a slight decrease on those at the end of 1910, and the partially developed reserves, amounting to 307,000 tons, are less by about 47,000 tons. In other words, the payable ore developed during the past year did not amount to the tonnage mined for the same period. I am glad of this opportunity, however, to assure you that the matter has no serious import whatever beyond the extra delay it occasions in arriving at the consummation of our policy of accumulating as quickly as possible the large tonnage of ore reserves requisite for justifying us in considerably augmenting the milling capacity, and in support of my statement I propose to give you a few details as to the developments since the commencement of the current year.

Development.

In the first place, the lowest level in the East Vertical Shaft section, which was the disappointing section as regards last year's development, is No. 12, which was commenced towards the close of last year. The sampling of this level has disclosed an average assay value on the whole of the footage driven this year of about 1dwt higher than the average value of the ore reserves. A winze being sunk from the 6th level east is giving a value considerably above the average value of the mine, and the same result applies to a raise now going up from the 8th level east. The important point is that these encouraging results are being obtained from a portion of the ground in which the drive values, as disclosed in last year's development, indicated unpayable ore. No. 1 and No. 3 mine sections are maintaining their steady average values. As regards the Rand Shaft section (Battery Reef), the results obtained during the current year are most satisfactory. The 3rd level south has been driven 250 feet, and the average assay value over the whole of this distance is 7½ dwts. over a width of 44 inches; while the 4th level (the lowest point so far reached in this section of your property) gives still higher value—disclosing an average of 16.2 dwts. over 42 inches for the full distance of 287 feet accomplished since the beginning of January. In referring to the exceptionally high values of No. 4 level north I do not wish to infer for a moment that they can be con sidered as normal, but I recapitulate them as indicating the extremely encouraging prospects of the latest development operations, and in order to bear out the statement which I made, in referring to the subject of the ore reserves, that the comparatively poor results for last year must not be regarded as having any serious or permanent influence on the real value of your mine. It is the experience in the instance of almost all of the mines on these fields that at some time or another a poorer zone of ore is encountered than the normal value of the property as a whole, and this was apparently the case last year in respect of your company. I regard the much improved development values now being met with on the 12th level of the East Vertical Shaft section as indicating that we have probably got away from the poor zone in this portion of the mine. A further favourable factor which I may mention at this point of my address is that during the last two months we have received a considerable accession to the native labour complement of the mine, which, unless the wastage for the next few months should be abnormally high, will enable us to proceed more energetically with the development of the several sections of the property than has been practicable for some considerable time past.

English Criticism.

Before leaving the question of development, I desire to refer to some critical comparisons brought to my notice as having been made in certain English newspapers, in reference to the apparent drop in the estimated average value of the ore reserves during the last three years. As regards the figure of value per ton given to the reserves in the annual report for the year 1909, of 6.36dwts. per ton, as contrasted with the estimated value of 5.5dwts. at the end of 1910 and 5.25dwts. at the 31st December last, I may remind you that milling operations were only initiated during the latter half of 1908, and that it was impossible to arrive at a fairly definite relation between mine valuations and actual recovery from the reduction plant until we had obtained the necessary data from the treatment of ore over a reasonable period. This was clearly explained and the apparent discrepancy accounted for by the manager in his annual report for the year 1910, wherein under the heading of "Ore Reserves and Reef values," he states: "In the above estimates the necessary allowances have been made for faults, dykes, and pillars. During the year additional information gained as to the extent to which the apparent mine value is adversely affected by detail faulting, which in places is much in evidence, has pointed to more severe adjustment of values than has been made in the past being necessary to enable a legitimate valuation to be arrived at. Adjustments on the revised lines have, therefore, been introduced in the present estimates." In making this explanation I must not be understood as inferring that development values cannot as a general principle be relied on as fairly representative of the results to be expected, but only that in the case of a mine in the early stages of crushing, and with a comparatively small extent of its reef-bearing area opened up, it is impossible to give an absolutely definite recovery value to blocks of ground which, though sampled on all four sides with the greatest care, may, when actual stoping operations are undertaken, be found to possess mining conditions, stoping widths and values which could not possibly be foreseen from the data given by development work. Roughly speaking, the conditions of each mine differ from one another, and this is exemplified by my own experience that whereas in some of the properties under the control of my firm the value of the ore contents as indicated by development work are exceeded in the actual recovery from the reduction works, in the instance of others the position is exactly the reverse. On the whole, however, after the experience gained by a comparison of the average yield from the reduction works with the mine valuation of the ore sent to the mill during the first few years of production, a fairly accurate relation can be arrived at as between the values disclosed by development and the recovery to be expected therefrom, and this factor is now the basis on which the ore reserves of your property are estimated.

Mine Development.

There is one item in the balance sheet at the 31st December last which appears to me to call for remark and explanation, i.e., the apparent anomaly that, though the ore reserves have not been increased during the past year, an amount of £10,722 has been added to the previous capital expenditure in respect of mine development. As a matter of fact, however, a very considerable measure of dead work has been effected in driving, crosscutting, etc., which though not immediately developing ore, represents necessary work for facilitating future mining operations and opening up blocks of reef-bearing ground in the different sections of the property. I may add that since the commencement of the current year we have introduced a new system of apportioning the underground mining costs, under which certain items of expenditure which were previously charged to mine development are now being borne by working costs. As a consequence, the amount debited to working expenditure for the four completed months of this year in respect of mine development redemption is approximately £3,300 in excess of the actual cost of mine development during the period. And this is not the only aspect of the change, inasmuch as though we have so far this year developed more payable ore—quite up to the standard of the ore reserves of the mine—than we have milled, no addition has been made to the capital account of mine development. Of course, another effect of the new system is that the declared working profits for the period appear to have dropped below the average for last year, whereas in actual fact they are higher; in other words, if the same system of allocating underground expenditure as obtained last year were applied to the present year's results, the working profit for the past four months would be well over £2,000 per month in excess of the declared figures. Perhaps some shareholders may be inclined to consider that we have made too drastic an innovation, but in view of the large scheme of development work on which we have embarked, it seemed to us to be the wiser policy to charge as little as possible to capital expenditure, even if this means that we are erring in another direction by debiting too much to working costs for the time being. If after having given the system a fair trial extending over a period of some months, we find that we are amply justified in reducing to some extent the monthly charge to working costs now being made in respect of mine development redemption, there will, of course, be no difficulty in doing so.

Additional Slimes Plant.

You will observe from the manager's report that certain new and additional cyanide tanks were installed during the past year; three additional slimes tanks and pumps are now being erected, the diameter of the tailings wheel is being enlarged, and the launders regraded, with the view of increasing the treatment capacity of the reduction works to about 400,000 tons per annum, as compared with the existing capacity of about 320,000 tons yearly. This work is almost completed, and provided that we can maintain the present level of our labour supply, we should be able to crush some 32,000 tons per month shortly, with a corresponding increase on the profits now being earned.

As regards the future, we shall concentrate our energies as much as possible on the development of the mine, and I trust that the close of the present year will see a considerable accession to the ore reserves. We have not for a moment lost sight of our objective of eventually conducting operations on a very large scale commensurate with the area of your property, and so soon as the ore reserves are approaching the tonnage which is requisite for appreciably extending the scope of mining and milling operations, the new construction work will be taken in hand. The surplus liquid assets at the 31st December last amounted to £250,000, which represents a substantial fund for the further expansion of your property as and when mining conditions may permit. Development operations are now giving better results, and the working profits at present being made are, as I have shown, in actual fact on the upward scale as compared with last year. I am decidedly hopeful, therefore, that on the occasion of the next annual meeting of your company I shall be able to point to an all-round improvement in results as compared with those for the past year.

On this occasion the annual meeting of your company is being held later in the year than has hitherto been the custom, but I think you will agree that the delay in bringing you together is more than compensated for by the issue of the annual accounts and reports to shareholders some seven or eight weeks before the date of the meeting. This innovation—which applies to all the mines under the control of the General Mining and Finance Corporation, Ltd.—has been under consideration by us for some time past, and we have now definitely decided to carry on the new practice in each future year also, with the view that shareholders, both here and in Europe, before forwarding their proxies for the meeting, shall have ample time in which to digest the accounts and the directors' report on the operations of the company for the previous financial year.

In conclusion, I have much pleasure in expressing the thanks of your board to your manager, Mr. Robert Pill, for the highly efficient manner in which he has carried out his onerous work during the year under review.

The report and accounts were adopted.

ROODEPOORT UNITED.

A Considerable Improvement.

Position Reviewed.

The ordinary general meeting of shareholders of the Roodepoort United Main Reef Gold Mining Co. was held on Thursday in the board room, General Mining Buildings.

The Chairman, Sir George Albu, in moving the adoption of the report and accounts, said: At the previous annual meeting of your company, when reviewing the accounts for the year 1910, I ventured to assert that the following year would show a considerable improvement in the returns from the mine, and I am glad to-day to be able to justify my prediction by pointing to actual results. The working profit for the past year amounted to £81,897, or an increase of £52,829 over the figure for the preceding twelve months. This substantial increase is due to a combination of all the three factors which make for better profits—larger tonnage, improved grade, and lower working costs. The tonnage treated shows an increase of no less than 115,848 tons, as compared with 1910, the yield per ton was 5d. higher, and the substantial reduction of 1s. 9d. per ton milled was effected in working expenditure for the year. The larger tonnage and decreased working costs are attributable entirely to the new mill and cyanide works, which were brought into operation during the latter half of the previous year, and which have proved to be probably the most efficient plant so far erected on these fields. As illustrating its effect on economical results, I may point out that of the reduction of 1s. 9d. per tion in working costs, about 6d. per ton represents the saving on milling, 2½d. per ton on sorting and breaking, and approximately 11d. per ton on cyaniding.

Justification for New Plant.

I think perhaps this is the right point at which to interpolate a few remarks with the view of setting at rest, once and for all, I hope, the doubts existing in the minds of a few shareholders as to the advisability of erecting such a powerful mill when it entailed the incurring of a large capital debt by the company. I pointed out in my speech at the previous annual meeting that had we continued to use the old mills and reduction plant our working costs would have stood at about the same figure as the average yield of gold per ton crushed that we are now obtaining; in other words, that we could not have treated the present grade of ore at a profit. Contrast that position, carried on for an indefinite period, with the profit of 4s. 6d. per ton which we earned last year from milling rock of an average recovery value of 21s. 8d. per ton. And bear in mind also that the indebtedness of the company was not entirely due to the new plant: a certain portion was incurred in the lengthy and costly dewatering, rebuilding, and sinking of the Kimberley shaft, and the re equipment of the old levels in that recently acquired section of your property. Personally, I do not care to think of the unenviable position in which your company would now be placed if we had not adopted the bolder but more progressive policy of erecting the new reduction plant. There is another misapprehension under which some shareholders are labouring and which I should also like to dispel: it seems to be concluded by these gentlemen (and I can make some allowance for their deductions, wrong as they are) that because we are only running an average of 55 out of the 100 stamps erected we have, therefore, foolishly installed a plant far in excess of what is required. In reply to this criticism, I may remind shareholders that the new mill was only designed by our engineers for a duty of 12 tons per stamp per diem—and even that figure was, at the time the specifications were being prepared, well ahead of any other mill on the Rand—which would have given a full crushing capacity of 35,000 to 40,000 tons per month, and which also represents the treatment capacity of the cyanide works. So effective, however, was the design of the plant that insttead of the 12 tons duty per stamp, it was found, after a series of practical experiments when the new mill had been erected, that the stamps had a crushing capacity of well over 20 tons per day each. Thus we found ourselves with a mill expected to be able to treat between 35.000 and 40.000 tons monthly, but which actually has a capacity of 60.000 tons per month. Surely we should not be blamed because the plant designed by our engineers has turned out to be so much more powerful and efficient than either they or we could reasonably anticipate? Generally, the reason for dissatisfaction lies in the contrary direction!

Financial Position.

Reverting from the foregoing disquisition to the accounts for the past year, the gross profit (including sundry revenue) amounted to £85.303. Of this £8,423 has been paid to the Government of tthe Union of South Africa in respect of profits tax for the years 1910 and 1911, £16,237 has been absorbed by interest on loans, and, as you will see on reference to the balance sheet, a net amount of £27.778 was expended during the year under the capital expenditure heading of mine equipment and development. The balance of profit has been applied in the reduction of your company's indebtedness, and in this connection I may point out that the amount due to the General Mining and Finance Corporation for advances has been reduced from £249.759 at the close of 1910, to £197,934 at the 31st of December last. The only other items in the balance sheet which appear to call for remark are the expenditure for the year of £40.351 on permanent works, and the deductions in respect of machinery and plant and mine development. The increase under the heading of permanent works represents the stripping, sinking, and timbering of the Kimberley main incline shaft during the year for a further distance of 1,008ft., or within 22ft. of the 14th level (and the equipment of the shaft with 60lb. rails, air mains, ore bins, stations, and sumps), and the sinking of the Kimberley east shaft to an adtional depth of 491ft., with the necessary equipment, ore bins, stations, etc. This is the class of work which has a most important bearing on the future working of the mine, but the full value of which is not reflected by a cursory glance at the accounts. As regards the decrease under the heading of plant and machinery, this comprises amounts realised by the sale of certain details of the old mills and cyanide works which are no longer required. The deduction from mine development account represents the difference between the amounts charged to working costs during the year for mine development redemption and the actual cost of development for the period. As the ore reserves were depleted to some extent during the year it is only fitting that mine development account, as a sub-heading of capital expenditure in the balance sheet, should also show a decrease.

Ore Reserves.

Dealing now with the subject of ore reserves, it will be observed that the payable ore fully developed at the 31st of December last, though giving a slightly higher value over a larger stoping width, shows a decrease of 168,935 tons, as compared with the payable ore reserves at the end of the previous year—in other words, that we only developed some 270,000 tons of payable ore during the year, as against 440,000 tons mined. This would at first sight appear to be a somewhat serious feature, and I am glad, therefore, of the present opportunity of assuring you that it does not merit the importance that some shareholders may have been inclined to attach to it. It was pointed out by the chairman at the annual meeting of your company two years ago that the south reef (the more consistent ore body as regards gold contents in the Roodepoort district) had then been almost entirely worked out in the old United section, and that as regards this reef the newly acquired Kimberley Roodepoort section must for the future be viewed as the main source of supply. It is clearly explained in the manager's report for the past year that the proper development of the south reef in the Kimberley section could only be effected to a limited extent until the sinking of the main incline shaft in this portion of the property had been carried to a sufficient depth to allow of additional levels being opened up. I have already pointed out that considerable progress in this respect was made during the past year, and I may supplement this statement by informing you that the work has not been allowed to fall into arrear during the last four months. The shaft has now reached a total depth of 2,746 feet, and a commencement has been made with the opening up of four new levels (the 11th, 12th, 13th and 14tb) on both south reef and main reef. The sinking of the Kimberley east shaft has also been pushed on with all possible speed, and the 3rd and 4th levels are now being developed, with excellent results. It will, I think, be obvious to you that with all the new faces which are being made available by the new levels in both shafts of the Kimberley section, a vigorous policy of development is being carried out which will make for a considerable accession to the ore reserves during the current year. It was because of this projected scheme of work having been put in hand, and our knowledga that, bar accidents, it would be carried into effect during the present year, that we did not view with any alarm the probability of the ore reserves being depleted to some extent during the past year, and that we, therefore, decided to maintain the normal scale of milling operations.

Fall in Profits.

As regards the fall in profits which has occurred during the current year, this is also a temporary phase, which will disappear shortly after we shall have effected the necessary connections in the Kimberley east section and the opening up of the new levels from the Kimberley main incline shaft. As pointed out in the manager's report we shall shortly have at least eight new faces available for attack on the south reef, and, later, a further eight faces on the main reef, in the Kimberley main shaft, as well as three additional faces in the Kimberley east section, which will effectually remove the disability under which we have lately been labouring of having only a limited number of points on south reef from which to draw the normal proportion of this ore body for the mill. I have explained to you on previous occasions that the main reef in the Roodepoort district is of a variable character as regards values, and it follows that if the stopes on this reef body fall in average value for the time being the normal grade must be made up by an additional percentage of south reef rock. Owing to the reasons which I have already given this levelling up has not been practicable during the last three months, with the result that the standard recovery value and the quantity of the ore sent to the mill have both temporarily decreased, with a consequent drop in grade and profits.

The Vogelstruis Absorption.

In the course of last year several references were made in the newspaper Press, both here and in Europe, to an impending absorption by your company of the properties of the Vogelstruis Consolidated Deep, Ltd., and the Vogelstruis Estates, Ltd., which adjoin the eastern boundary of the Kimberley Roodepoort section of your mine. I may state that it is a fact that negotiations with this object in view have taken place, and that terms of purchase were provisionally arranged with both companies, subject to ratification by the shareholders of each company concerned, including the Roodepoort United. It became evident, however, that, in view of the market conditions prevailing at the time, sufficient support to the scheme by the shareholders of this company would not be forthcoming, and under these circumstances it was considered that it would be useless as well as undesirable to submit it to them. These unfavourable market conditions also constitute the reason for our having been unable to capitalise the debt due to the General Mining and Finance Corporation on terms which would be satisfactory to the shareholders of this company. I need hardly say, however, that directly a favourable opportunity occurs your directors will evolve and submit to shareholders a scheme for the liquidation of this debt, and for again placing the company on a dividend-paying basis.

Since the close of the year Mr. P. Q. Treloar has resigned his position as manager of your property, and Mr. H. Ross has been appointed to the vacancy. We are justified in anticipating that Mr. Ross will carry out his duties to the entire satisfaction of the board.

On this occasion the annual meeting of your company is being held later in the year than has hitherto been the custom, but I think you will agree that the delay in bringing you together is more than compensated for by the issue of the annual accounts and reports to shareholders some seven or eight weeks before the date of the meeting. This innovation (which applies to all the mines under the control of the General Mining and Finance Corporation, Limited) has been under consideration by us for some time past, and we have now definitely decided to carry on the new practice in each future year also, with the view that shareholders, both here and in Europe, before forwarding their proxies for the meeting shall have ample time in which to digest the accounts and the directors' report on the operations of the company for the previous financial year.

The report and accounts were adopted.

Messrs. George Nathan and Hans Neuhaus, retiring directors, were re-elected.

The auditors, Messrs. Thomas Douglas and A. Eckart-Beckmann, were reappointed.

EAST RAND CENTRAL.

Marking Time.

The tenth ordinary general meeting of the East Rand Central Mines, Ltd., was held in the offices of the secretaries, Bettelheim Buildings, Simmonds Street, last week. Mr. Michael Dodd presiding. Those present included Messrs. A. A. Osborn, J. T. Williams, H. Sothcott, H. Hargreaves, J. H. Goldreich, H. Daniell, J. E. Jones, F. W. Baxter, A. C. Allen, and E. Rothschild

The Chairman's Speech.

The directors' report stated that "Your property, consisting of gold and coal claims on the farm Schapenrust, remains unchanged. There has been no work done during the year. The agreement with the Government by which your coal area was united with the Government portion of the farm Brakpan continues in force, but, doubtless owing to the unfavourable market conditions prevailing, no further attempt has been made by the Government since the last report to lease the area. The capital, as well as the number of shares held in reserve, remains the same as at the end of the previous year. The year's revenue, derived from interest and rent, amounted to £2,247 14s. 6d., while the expenditure was £2,345 0s. 11d., so that the income failed to meet the outlay by about £97. Of the expenditure, £459 11s. 5d. was due to the running of a London office, and arrangements are in progress with a view to the cutting down of this expense to a minimum."

A discussion took place on Mr. Daniel suggesting a reduction in the directors' fees to £250, as long as no actual work was being done, and, in replying to it, the chairman said he was prepared to take less for the current year.

It was agreed to leave the matter to the board, on the assurance that it would be discussed.

The appointment of Mr. E. Mansfield to fill the vacancy on the Board caused by the resignation of Mr. R. T. Mathison, was confirmed, and the board was re-elected, Mr. Osborn replacing Mr. Grant.

Mr. Daniell suggested that the directors should call an extraordinary general meeting to resolve on the reduction of the company's capital of £175,000, of which £151,340 was issued, to £43,750, divided into 175,000 shares of five shillings each by paying off in cash to shareholders 5s. per share, which would amount to £37,835. This left the company £16,000. The annual expenses would be about £1,600.

The Chairman said the suggestion fell in with his own view. He would like to see a scheme of the kind carried out. He had been working at it for a little while, and he was still engaged in consulting shareholders, and would like to be able to go to the meeting with something as near unanimity as possible. He suggested that, instead of calling a meeting as soon as possible, it should be called as soon as practicable.

This was agreed to.

The Municipal Council of Johannesburg has accepted the following tenders, viz. :—Messrs. Stewarts and Lloyds, for the supply of 10,000ft. ¾in. galvanised pipe, at 2.9d. per ft., £120 16s. 8d. · 100 1in. galvanised elbows, at 5.25d. each, £2 3s. 9d. ; 50 ¾in. x ½in. galvanised tees, at 4.1d. each, 17s. 1d. ; 50 1in. x ¾in. galvanised tees, at 5d. each, £1 0s. 10d. ; 25 4in. black bends, at 8s. each, £10 ; total, £134 18s. 4d. Mr. H. Ainsworth, for the supply of 36 3in. black flanges, at 1s. 10d. each, £3 6s. ; 24 4in. black flanges, at 2s. 9d. each, £3 6s. ; 12 6in. black plugs, at 2s. 6d. each, £1 10s. ; total £8 2s. Messrs. Henley's Telegraph Co., for the supply of 2,000 lbs. Single Cotton Covered and Braided Copper wire, at 10¾d. per lb., total, £89 11s. 8d. Messrs. Jenkins and Co., for the supply of 20,600 lbs. of bitumen, value £194 12s. 5d. The Neuchatel Asphalte Co., for the supply of ten casks of bitumen, at a cost of £55 14s. Mr. A. Chater for a 3½ h.p. "Humber" motor cycle, complete, with lamp, horn, tools, etc., for £58. The Dawson City Awning Co., for the supply of Bell Tents to Council's sample, at £3 10s. 9d. each, during a period of 12 months. Messrs. Bartle and Co., for the supply of graphite ("A" quality), as required during 12 months from date of acceptance, at 37s. 6d. per 100 lbs. Mr. H. J. Henochsberg, for the supply of uniforms for natives, as required during a period of 12 months, from 1st April, 1912, at £2 0s. 6d. each. Messrs. G. Dessimoni Brothers, for the supply of 1,100 yards of granite kerbing, at 8s. 3d. per yard. Messrs. H. Bain and Co., for the supply of 2,500 tree guards, at 5s. 0¾d. each ; 200 garden seats, at 29s. 5⅞d. each. Messrs. Felber, Jucker and Co., for the supply of ironwork for drainage subway at abattoirs, for the sum of £485 4s. Messrs. Brook and Co., for supply of 114 C.I. manhole covers, at 65s. 6d., £373 7s. ; 122 C.I. sewer covers, at 23s. 3d., £141 16s. 6d. ; 13 C.I. kerb inlets, at 25s., £16 5s. ; total, £531 8s. 6d. The Consolidated Rand Brick, Pottery and Lime Co., for the supply of 1,000 4in. pipes, at 1s. 6d., £75 ; 700 5in./6in. junctions, at 14s., £490 ; 500 5in. access pipes, at 4s. 3d., £106 5s. ; 700 4in./5in. tapers, at 9s., £315 ; 700 5in. stoppers, at 9d., £26 5s. ; 1,000 4in. stoppers, at 6d., £25 ; total, £1,037 10s. Messrs. J. and C. Murray, for 52½ tons (each 2,240 lbs.) "Waverley" Crown best horse-shoe bar iron, at 12s. 7¼d. per 100 lbs. ; total, £741 2s. 6d. Messrs. Niven and Mitchell, 100 boxes No. 6 Globe horse-shoe nails, at 9s. 1¾d., £45 14s. 7d. ; 126 boxes No. 7 Globe horse-shoe nails, at 8s. 4d., £52 10s. ; 10 boxes No. 10 Globe horse-shoe nails, at 7s. 2¼d., £3 11s. 10d. ; total, £101 16s. 5d. Mr. A. E. Ettlinger, for F. Bird and Co., 18½ doz. Nicholson's rasps and files, at 16s. 9d. ; total, £15 9s. 10d. The Eclipse Brick Co., for the supply of 50,000 bricks, at 65s. per 1,000 ; total, £162 10s. Messrs. H. Barder and Co., for 50 tons bitumen ; total, £700. Consolidated Rand Brick, Potteries, and Lime Co., for 10,000 earthenware troughs, at 1s. 3d. each ; total, £625. Vereeniging Brick and Tile Co., for 10,000 earthenware troughs, at 1s. 3d. each ; total, £625. The Vereeniging Brick and Tile Co., for the supply of 161,500 bricks, at 68s. 6d. per 1,000 ; total, £553 2s. 9d. The Diamond Cycle Co., for the supply of Diamond B.S.A. bicycles, during a period of twelve months, from 1st April, 1912, at £9 each. Messrs. S. Sykes and Co., for the supply of 50,000 porcelain bridges, at 9s. 6d. per 100 ; total, £237 10s. Mr. R. Hudson, for the supply of light railway track, for the sum of £592 1s. 8d. Messrs. Reid Bros., Ltd., for the supply of 3,500 2in. x 1½in. x 1¼in., and 1,500 3in. x 2in. x ¼in. channel iron ; total, approximately, £155 15s. The Norwegian African Co., for the supply of 500 16ft. x 3in. x 9in. deals, at 7 1-16d., £235 8s. 4d. ; 500 18ft. x 3. x 9in. deals, at 7 3-16d., £269 10s. 7d. ; total, £504 18s. 11d. Mr. H. A. Neame, for the supply of shingles, at 12s. per bundle of 250, size, 16in. x 3in. and up ; approximate total, £270.

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Notes and News.

The Labour Problem in C.S.W.A. Despite the declared opposition of the Indian Government the Luderitzbucht Chamber of Mines has received permission from the German Colonial Secretary to import 1,000 Indians, as the mines there are finding increasing difficulty in obtaining labour. Now that the taxation has been altered from gross to net, it is believed that the labour requirements will increase very considerably, as all the northern fields, which up to the present have not been able to operate on account of the high working costs, will now be able to commence work. Several companies had already been formed in Germany, and had taken up large groups of fields in the region of Conception Bay in anticipation of the tax being altered.

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Anthracite near Indwe. In making a casual trial, for a suction gas plant, of some coal which had long been known to exist upon his farm, near Xuka Siding, Mr. Jelliman found that the fuel was anthracite of excellent quality. Subsequent tests, specially made, showed it to be equal to Welsh anthracite. Xuka Siding is on the Indwe-Maclear line of railway, about 67 miles from Indwe, and the facilities for obtaining cheap coal by rail prevented any attempt being made to work the coal on the property itself. As far as we know there is no other anthracite to be obtained nearer than the Transvaal or Natal, so that the discovery referred to should prove valuable to those who require fuel of that kind in the Cape Colony. We understand that the owner is prepared to put it on rail at Xuka Siding for 15s. per ton.

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Bellevue. A flotation is reported to be on foot in connection with the Bellevue claims, to which reference was made in a recent issue. We have not been able to see a prospectus of the venture, although one marked "for private circulation only" is said to have been prepared. Samples have been on view at the office of the Secretary, Mr. Geo. Peel, in the new Stock Exchange. Some of the best show a remarkable resemblance to the rich pipe ore of the Zaaiplaats mine; in fact it seems impossible to detect any difference between them. To judge from the remarks of those who claim to know the Bellevue ground, this is merely a sort of coincidence. As we have not seen the prospectus nor had an interview with the person who brought the samples to town, we are unable to give any further information to those who have made enquiries about the venture. As has been mentioned above, it is said to be a private promotion.

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Solomon's Temple Tin. The secretary has despatched the following cable to the London office of the Solomon's Temple Tin Mines, Ltd.:—"North fissured section, No. 9 shaft, encouraging discovery 12 feet from surface. Average values, 5 oxide over 4½ feet by 5 feet. More work must be done before definite conclusions can be arrived at as to permanent value of discovery. Publish."

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Transvaal Chemical Industries. Satisfactory progress is reported in connection with the Tweefontein Power Scheme, with which is to be associated an ammonium sulphate manufactory. Mr. Whalley, the representative of Messrs. Harper Bros. in Johannesburg, will arrive in England within the next week and his presence there will doubtless be of considerable assistance in the arrangements which are being made with regard to the undertaking. The Marquis of Winchester, as chairman of the Victoria Falls and Transvaal Power Company, is interested in the scheme by reason of the fact that a large quantity of power will be taken, as soon as available, from that company. The cement factory, with the inauguration of which Mr. Whalley is also associated, will doubtless receive early attention in London. Mr. Brooks, who came to the Transvaal on behalf of the

Associated Portland Cement Manufacturers, is now in England. The site for the factory, near the Black Reef, has already been purchased.

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Winding Ropes.

The latest Prussian statistics of shaft hauling ropes, which have lately been published, contain a large amount of information which is interesting and useful for rope makers as well as for mining men on the Rand. They are exhaustively and critically discussed by Professor Herbst, of Aix-la-Chapelle, in a series of articles in *Glückauf.* Among the general conclusions arrived at, the following are of special interest: (1) The protective efficiency of lubrication has not been plainly proved except in dry shafts. This observation suggests the conclusion that the present lubrication processes for wet ropes leave room for improvement, though it is certain that all now known lubricative agents rapidly disintegrate in shafts with sour or salty waters. Future experiments in this direction may provide a remedy. (2) Galvanising or coating with zinc does not appear to have had a really protective efficiency in wet shafts, the reason being probably that zinc coating has but little power of resistance to salt water. It is also suggested that the wires have suffered by the galvanising process, for, though it has been proved by Winter and others that that process, when properly and carefully executed, does not unfavourably affect the ropes, it is also well known that it often reduces the tensible strength of the rope by 50 per cent. and even more. (3) The hauling efficiency of ropes in dry shafts stands in the proportion of 100 to 60 or 70 to that in wet shafts, a fact which, in view of the high prices of ropes, means a very substantial economic advantage for dry shafts. (4) Tensile strength between 160 and 180 kgs. per square mm. does not very unfavourably affect the flexibility or hauling strength of the ropes, while ropes of more than 180 kgs. per square mm. have given substantially lower efficiency figures. (5 The greater or lesser strain, as expressed by a higher or lower safety factor, put upon ropes has had no influence upon their consistency. It may, therefore, be assumed that the advantages of a higher safety factor are neutralised by its disadvantages—viz., greater rope thickness combined with reduced flexibility and greater dead weight.

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Durban-Roodepoort Gold Mining.

The report of the Durban-Roodepoort Gold Mining Company for 1911 states that the mining results for the year have been satisfactory. The total arising from the year's operations amounts to £60,256, after allowing for a sum of over £13,000 for repairs to the main shaft, but the crushing of the shaft has greatly decreased, and, should nothing unforeseen happen, a gradual reduction in the outlay is confidently anticipated. The native labour supply for the year has been satisfactory and the health returns from the native compound excellent, and the consulting engineer reports both mine and works to be in good condition, and that no undue capital expenditure is anticipated. The ore exposed at the end of the year was 1,070,359 tons. The financial results of last year may be briefly summarised as follows:—Credit balance from 1910 £20,015; while the profit for 1911, plus the amount obtained from sale of accumulated slimes, was £51,785, together £71,800. Dividends amounting to 40 per cent. have been paid, leaving to be carried forward £21,777. For the first quarter of the current year a dividend of 10 per cent. has been paid, thus bringing the total amount of dividends paid since the formation of the company to 1,085 5-6 per cent., or over £1,333,000. The sum of £3,750 has been allowed for depreciation on plant and machinery, and the net sum of £280 incurred for capital expenditure, including the erection of a new change house for natives.

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South-Western Transvaal Diggings.

The latest news from Mooifontein states that though work has been somewhat restricted by adverse weather conditions, a fair number of diamonds had been found at No. 4 area, the largest being about 14 carats. On Nos. 1 and 2 areas some of the diggers have been finding fairly well, although the stones are generally small; and at Weltevreden the finds continue to maintain their past average. It is anticipated that the April returns from the Bloemhof diggings will be equal if not over the March figures, and work continues to be vigorously pushed by claim holders. Diamonds are said to be fetching "about 20 per cent. less than recently owing to a drop in the American demand," and that, where possible, "diggers are holding for a rise."

* * * *

Our Land Survey System.

A valuable article by Mr. Van der Sterr on "Our Survey System and Its Economic Value" appears in the current number of the *Journal* of the Institute of Land Surveyors of the Transvaal. The article merits, as the *Journal* points out, careful perusal by all interested in the subject of land titles. Our system is a curious one. It combines much of what is best and what is worst in survey practice. We have the examination of diagrams for consistency, and their certification by the Surveyor-General, but no examination of the survey itself. Many of the public suffer under the delusion that because a diagram has been examined and approved by the Surveyor-General, such approval carries with it a guarantee that the survey is correct, whereas the survey might be entirely the result of a fertile imagination. South Africa is unique in being the only country where there is an elaborate system of examination of diagrams and no examination at all of the surveys on which they are based. Now that the Survey Bill is in Parliament, the article under notice is of great interest, not only to surveyors, but much more to land owners.

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Victoria Falls Power.

The secretary of the Victoria Falls and Transvaal Power Company, Limited, writes under date of April 4: "The rapid growth in the demands for the supply of power on the Witwatersrand has made it necessary to increase substantially the installation of machinery. It is proposed to create £2,000,000 of second debentures, and to issue at the present time half this amount—namely, £1,000,000—carrying interest at 5½ per cent. per annum, and to hold the balance for issue as and when the necessity arises. Since the erection of the power stations of this company and of the Rand Mines Power Supply Company, Limited (the entire capital of which is owned by this company), constant demands have been received for an increased supply of power from consumers, who are entitled under long-term contracts to be supplied with all the power that they require. The Victoria Falls Company has received applications for supplies of electricity amounting to 52,000 h.p. In addition to this, the Rand Mines Power Company has received applications for supplies of electricity of 67,000 h.p., and of compressed air of 66,000 h.p., making a total notified demand of 185,000 h.p. The total capacity of generating plant now installed or shortly to be completed—including the plant which must be kept for reserve—amounts to 132,000 h.p. Consequently, further extensions are immediately required. Moreover, extensions of the compressed air distribution system are needed, and most of the necessary plant must be provided at once and the remainder will have to be installed very shortly. The profits continue to increase rapidly with every addition to the generating plant, the monthly profits before deducting debenture interest and depreciation having risen from £12,000 in January, 1911, to £37,000 in February, 1912. On the basis of the results already obtained with our present earning capacity, it is estimated that when the plant required to meet the notified demands is in operation, the annual profits, after providing all working expenses, but before allowing for debenture interest and depreciation, will amount to £670,000."

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African City Properties Trust.

In their report the directors of the African City Properties Trust state that the company's manager in Johannesburg is of the opinion that, having regard to the metropolitan character of Johannesburg, he can safely predict continued prosperity with regard to the company's more important properties, situated as they are in the best centre of the city. The profit of the company for the past year, including the balance brought forward, was £35,711, which was reduced by the payment of Debenture interest and the Preference dividend to £18,211. A dividend of 4 per cent. is recommended on the Ordinary shares, leaving to carry forward £9,397. This company is slowly improving its position, and the Ordinary shareholders will view their augmented distribution with some degree of pleasure.

* * * *

South-West Africa Company, Ltd.

The directors of the South-West Africa Company have, as usual, a satisfactory report and balance sheet to place before their shareholders. For the past year the profits aggregated £142,028 after writing off over £60,000 from investments and shares in other companies, and with the balance from the previous year there was a sum of £184,760 available for dividend. The directors recommend the payment of a dividend of 5 per cent. and a bonus of 2½ per cent., which will absorb £131,250, thus leaving £53,510 to go forward. A list of the investments, standing in the balance sheet at £967,260, is given, and as these are all gilt-edged securities, they may be regarded as quite satisfactory. The South-West Africa Company holds 49,760 Deferred shares in the Otavi Company, which, curiously enough, possess no nominal value, but as the dividend last year from each share was 6·50 marks, they may be said to possess a very real value. The company is also interested in the Otavi Exploring Syndicate, Kaoko Land and Mining, and other companies, by means of which the large territory controlled is being prospected. Good shows of tin have been encountered, and during the rainy season some important results are expected. The balance sheet of the company discloses a very strong position, as has been the case for some years past. The cash in hand amounts to £467,258, while the sundry debtors, deducting creditors, aggregate £334,000. The share capital is therefore represented by the investments, cash, and debtors, and this is, of course, exclusive of the shares in other companies, buildings, plant, and concessions.

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The Use of Concrete Underground.

Concrete has been largely employed on the Rand, but mainly, if not entirely, for the mill construction and cyanide tank foundations. A few shafts are partially concreted, but the use of this material underground has not been very extensive in the Transvaal. It is, therefore, of much interest to note the opinions of an American engineer of repute on the subject. In the course of an article appearing in a United States contemporary, it is stated: "Perhaps the most desirable substitute for timber in underground mine work is concrete; at least, that is the opinion which appears to be gaining in popularity. In surface plants it is already an important building material. Concrete has properties which most of its competitors have not; it is durable and fireproof, and will resist the pressure, the atmospheric changes, and the acid water which ordinary materials of construction could not possibly stand. For these reasons concrete is being used to a larger extent in the copper and iron mines of the Lake Superior region, and in some mines in the West. In shaft work concrete is most serviceable, and initial experiments were made in a prominent western gold mine to utilise concrete in walling up a stope to prevent a cave-in after the ore had been mined in a way to permit the removal of the timber to other points of production underground. Where the materials used in the preparation of concrete are easily obtainable, and where timber is expensive, the idea of employing concrete to wall up stopes may some day become as popular as the back-filling method employed largely in the Lake Superior copper mines. Lining a shaft with concrete may be somewhat more costly than timbering at first, but eventually concrete will be found to be less expensive and more durable. At any rate, mine owners might benefit by giving concrete the consideration it deserves as a substitute for timber. Steel for underground work in this country has not appealed to mine managers to the same extent as it has in Europe, and the probability is that concrete will be preferred."

TOPICS OF THE WEEK.

THE ALBU GROUP.

Sir George Albu's speeches at the annual meetings of half-a-dozen companies of his group, last week, were models of the businesslike pronouncements in fashion to-day. There was little about labour, less about the sharemarket, and nothing at all about politics in any shape or form. Throughout each speech he stuck closely to the facts regarding each mine, and through all there ran the golden note of optimism that has never failed or deceived the leader of the Albu group. Of labour, Sir George's most significant remark was made at the Cinderella Consolidated meeting, and was to the effect that he hoped shortly to see the groups combine to stop the high cost of, and recruiting competition for, native labour. As we believe that an agreement on this question now awaits but the signature of one or two of the leaders of the industry, it is plain that Sir George could hardly have said more or said less on the subject at the moment. Regarding the sharemarket, Sir George could only echo the pious hope that it would mend in good time to supply companies such as the Rand Collieries, New Steyn Estate, and Aurora West with the needed capital to realise their industrial possibilities. Of these larger questions, the approaching annual general meeting of the parent company will no doubt supply Sir George with a more fitting opportunity to treat. His pronouncements on that occasion will, therefore, be looked forward to with more than the usual interest that attaches to his very frank and plain-spoken utterances. From the reports of the meetings held last week it will be seen that most of the mines of the group are still in a state of transition. The Meyer and Charlton has only just got into its stride, after the recent change and temporary stoppage; the Cinderella Consolidated and West Rand Consolidated are still in what may be called preparatory crushing stages; the Roodepoort United is still developing its ground; the Rand Collieries awaiting more capital to push on; and the New Steyn Estate and Sacke Estate are marking time. Of the Goch alone may it be said that, were it not for labour troubles, it would be working at normal pressure. The Meyer and Charlton, however, will soon show what it can do. At the Roodepoort United Main Reef there has been a reduction in the ore reserves, but now that the Kimberley shaft has been sunk sufficiently to permit of the opening up of several new levels, it is hoped to overtake the depletion. The New Goch working profit is lower by £14,223, in spite of a larger crushing. Native labour troubles have been the main factors in bringing about these untoward results. On the other hand, the ore reserves have been augmented by 152,944 tons. Sir George warned shareholders that a great deal of work will be necessary before it will be possible to win ore from the higher grade ground. Therefore the recovery in output and profits which he confidently anticipates can only come about gradually. The West Rand Consolidated has suffered from the shortage and expensiveness of native labour. Last year the ore milled was 77,000 tons more than that dealt with in 1910, yet the profit only went up by £10,000. The development programme had to be curtailed. Recent development operations have yielded greatly improved results as regards grade, and have replenished the reserves at a more rapid rate than mining has depleted them. At the Cinderella Consolidated the result of last year's work was to increase the payable ore reserves by 318,273 tons. Sir George Albu estimates that by the end of this year the reserves will attain 1,500,000 tons. It will then be practicable to enlarge the capacity of the crushing plant to an extent commensurate with the company's claim-holding. At the Aurora West the capacity of the milling plant has been increased, and a scheme for capitalising the company's debt is to be submitted in May. No attempt is here made to quote from Sir George Albu's speeches, which we print in full, and no portion of which can be considered irrelevant. The year, it will be seen, was a trying one, but the net results must be written down as satisfactory in the face of difficulties, and the outlook is most promising.

MINING QUESTIONS IN PARLIAMENT.

Though Defence and Land Banks have taken up most of the time in the Assembly of late, they have not monopolised it. The Select Committee on the Phthisis Bill is known to be putting in a lot of solid, if silent, work; the diamond industry has afforded an interesting topic for discussion; estate duties have enjoyed a whole debate of their own; and in the Senate, Senator Whiteside, of all people, has set the Bewaarplaatsen ball again rolling. Of the Phthisis Bill, which may be regarded as *sub judice*, perhaps the less said at this stage the better. The miners speaking, some through the Cornish Association and some through the official Labour organisation, have submitted to the Select Committee their views on the Bill. These will, no doubt, be taken for what they are worth, but the big questions to be reported on by the Committee will hardly be much elucidated thereby. Every day new facts are being brought to light with a material bearing on the matter, and it will be impossible for the Committee to ignore the evidence being elicited at the meetings of the Tuberculosis Commission on the Rand. Nor can such material evidence as the complete report of the West Australian Phthisis Commission, and the corrected statistics of the recent Medical Commission Report, fail to influence the findings of the Select Committee. On the subject of Bewaarplaatsen, Mr. Whiteside has asked that a return be laid on the table of the House showing (a) the number of bewaarplaatsen and their locality on the Witwatersrand sold or leased since January, 1908; (b) the names of persons or companies to whom such were sold or leased; (c) price and terms on which such bewaarplaatsen were sold or leased; and (d) stating those instances in which public tenders were called for such sale or lease and any other details in connection therewith. The replies to those questions will be awaited with interest, though they appear to have no bearing on the main question, which is, when will the Government redeem its obligations and do justice in this matter? The estate duty debate was quite the most important of the week. The attitude of the Government on this matter is, unfortunately, but symptomatic of its general attitude on mining and financial questions, and, for that reason, the stand made by the Opposition was most necessary and desirable. The question had been thrown open again by General Smuts's ingenious amendment, designed to get at that part of the estates of persons dying abroad which consists of "bearer" shares in South African concerns. There were two lines of criticism by the Opposition. First, there was the fact that General Smuts's proviso was calculated to do more harm than good. The idea that the annual tax on the dividends from such shares would have the effect of frightening away capital had been pooh-poohed with much vigour, and Mr. Fremantle and others had endeavoured to argue from the experience of Great Britain that this argument was quite groundless. Mr. Chaplin, Sir David Harris, Sir Lionel Phillips, and other speakers showed the futility of this answer to the warning by pointing to the all-important fact that Great Britain has more capital than it needs, whereas South Africa is, and will be for some time to come, a borrowing country. In the second place, it was shown that the scale of duties put forward by Mr. Hull represents not a consolidation but an increase on existing taxation. "We see the shadow of a general income tax stealing gradually across the House," exclaimed Mr. Merriman. All sorts of schemes were being brought forward, he continued, and the money for them could only be obtained by new measures of taxation. If an income tax were coming, General Smuts's idea ought to form a part of any proposal under that head, and in any case it was more likely to hit the small investor than capture the dollars of the millionaire. Sir Lionel Phillips made it perfectly clear that the purpose of the Opposition was not to combat reasonable taxation, but to see that sound principles were observed. "Do not," he said, "set a direct bar, however slight, against the investment of capital. If you want to tax the thing on the spot, tax the industry concerned honestly and frankly, and then everyone will be paying his fair share." The motion to go into Committee on the proposals was passed, but not before the Minister of Finance had promised to reduce the scale of the proposed duties and to make special exceptions for the benefit of oversea investors of moderate amount. It is clear from these indications that the mining men in the Assembly are, as usual, putting up a strenuous fight in the best interests alike of the industry and of the country. It is their privilege and responsibility to represent the business brains of the House. If they are not listened to, so much the worse for South Africa, and so much the worse for the future of the Government that ignores expert advice. But whether they are listened to or not, it is their plain duty to continue to advise and, when necessary, to warn. They can rest content that the future and the country will judge their actions correctly.

THE PLIGHT OF THE COAL TRADE.

Despite the statements recently made in the Assembly by Mr. Sauer to reassure the coal-owners of the Transvaal and Natal, there appears to be still considerable ground for dissatisfaction on the part of the industry. This is felt particularly in Natal, where Mr. Francis Oats, at the meeting of the South African Collieries, voiced the continued discontent with the treatment accorded to the Natal Collieries by the Government, and in this connection his remarks were endorsed by the Natal Press. Passing over that portion of the speech made by Mr. Oats, in which he attacks the Government for its alleged preferential treatment of Transvaal coal, we find him condemning the policy of the S.A.R. in strong general terms. In the course of his speech, Mr. Oats claimed from the Government the same sympathy for the coal industry as they had shown to others, the mealie farming industry for instance. With lower railway rates and harbour charges, nearly the whole of the ocean bunkering between America, Europe and the East via the Cape could be done at Capetown. He hoped that his words had fallen on good ground, and that every shareholder, present or otherwise, would use whatever influence he had to persuade the Government into greater sympathy with the Natal coal industry. What the collieries asked for was not so much a rise in present prices as the means to supply wider markets, so as to keep the mines fully at work, which would reduce their working costs considerably. Again, we have the *Natal Advertiser* with the following indictment: "The position of the coal industry of Natal is most deplorable. Steamers which arrived several days ago are still at the moorings awaiting coal, and, as far as one can learn, there is little prospect of any of them getting away with promptitude. The question is: what is becoming of the trucks? That they are not being sent to the Transvaal collieries is proved by the fact that the Royal Prince, now in Durban harbour, was due to coal 300 tons at Delagoa Bay, but the local agents received a wire to the effect that it was useless to send the steamer on, as there was no coal at Delagoa Bay, owing to a shortage of truck supply. As a matter of fact, several of the Transvaal collieries have been sending coal to Delagoa Bay in closed-in cattle trucks. Anyway, the position has assumed such proportions that an urgent enquiry should be demanded. Last week a vessel was sent away from Natal to load Natal coal at Capetown, and this week we have an accumulation of steamers at the port waiting for coal, which is lying ready at the mines, but for which no trucks are available to bring down. In this connection several urgent wires have, this week, been despatched to the general manager, but satisfaction was not obtained. During the week, Sir Thomas Price, a member of the Railway Board, visited the port. It is to be hoped that the opportunity of impressing upon him the necessity for a more speedy delivery of coal, and more of it per day, was taken advantage of." From Delagoa Bay come similar complaints no less emphatic and well-grounded. From this it will be seen that neither the Transvaal nor Natal have anything to thank Mr. Sauer for, and a semi-official *apologia* appearing in the current number of the *S.A. Railway Magazine* "cuts no ice." It is to be hoped that the members of the Assembly who drew from the Minister his unfulfilled promises will return without delay to the question.

REORGANISING RAND LABOUR RECRUITING.

Big Scheme to Save the Industry Three-quarters of a Million a Year—Will the Groups agree?—Issue Still Undecided.

It is an open secret that the sub-committee of the Chamber of Mines appointed to deal with the question of independent recruiting by the groups in British South Africa, excluding Rhodesia, have prepared a scheme likely to please everybody, and that the agreement now only awaits the assent of one or two of the leading groups to become binding on all. At the Cinderella Consolidated meeting, last week, Sir George Albu said significantly: "I may say I am hopeful that as a result of recent conferences between the mining groups on these fields, a reasonable and sensible arrangement may be arrived at in the near future which will have the effect of reducing the cost of our native labour without impairing its efficiency or the normal volume of its supply." In the same connection, Mr. H. O'K. Webber stated at the Witwatersrand Native Labour Association meeting that in order that the tendency of the natives to come in of their own free will may be encouraged among the natives of the Cape Colony, and in order that they may be given every facility to emigrate from the Transkeian territories for work in the Transvaal, the Association has lately inaugurated a system of establishing forwarding stations at convenient places in the Transkei and Pondoland, where natives wishing to work on any particular mine can accept the terms offered by that mine and engage themselves on the spot before proceeding to the Transvaal. "It is hoped that by this means," said Mr. Webber, "the natives of the Transkeian territories will gradually learn to find their own way from their homes direct to the mines on which they wish to work. They will be given every facility for coming up to the Rand, though those in charge of those volunteer attesting stations will not in any way engage in what is known as recruiting the natives for work. As time goes on, it is hoped to extend this system to all the territories within the Union, and thereby do away with expensive organisations for recruiting natives and the paying out of advances to them before they leave their homes." As we stated last week, plans to this end are even further advanced than Mr. Webber indicated, and the costly recruiting competition so often of late deplored by Rand chairmen may soon come to an end. A similar statement, it will be remembered, was made at the Voorspoed meeting by Mr. M. Elkan, and a cable from London on Thursday announced a meeting of the representatives of the South African groups there to consider the question. An official statement would, at this moment, of course, be premature, but it is estimated in usually well-informed circles that a saving of some three-quarters of a million annually to the industry would be a possible result of the scheme. The main difficulty lies in the respective voting powers of the groups on the central controlling body to be created. This difficulty, it is hoped, will not prove insuperable, and nothing will then stand in the way of reorganising native recruiting for the mines on a sound business-like and common-sense basis.

THE TIN FIELDS.

Pegging Results near the Century Tins—Activity on Witfontein and Sand River—The "Picking Up" again of No. 13 Zaaiplaats.

Rhenosterhoekspruit and Uitkyk.

About 10,000 feet along the line of strike have been pegged since the recent proclamation of these farms, and samples of ore brought from the ground in question afford satisfactory indications of tin ore. With regard to the disputes referred to in the *Mining Journal*, a fortnight or so ago, as likely to occur between the various pegging parties, it is gratifying to learn that an amicable settlement has been arrived at by all the persons concerned.

Witfontein.

On the farm Witfontein, which lies about ten miles or so south-east of the farms just referred to, the Transvaal Consolidated Lands have opened up a deposit which shows some remarkably rich ore, and a vertical shaft has been sunk upon it to a depth of about 200 feet. Tin is found on this farm both in the felsites and granite, but a year or two ago the occurrences in the alluvial gravel were considered the most important from the economic point of view, the bodies in the granite being said to be small and patchy, while those in the felsites were disappointing owing to their want of persistence in depth. The discoveries which are said to have been made by the Transvaal Consolidated Lands are, therefore, of more than usual interest.

Sand River.

The farm Sand River lies east of Rhenosterhoekspruit, at a distance of about four miles, and this, we understand, has been taken up by the Consolidated Goldfields, who are actively prospecting the area. A great deal of work is going on in a quiet way in the district, but very little news leaks out to the public ear. At the next appearance of a tin boom, which may occur at any time, we shall doubtless hear of new ventures springing up in all directions.

Zaaiplaats.

The event of the past week has been the announcement of the picking up again of the No. 13 ore body, which had been thrown along a fissure into the hanging wall. With regard to this circumstance, the manager wired on the 2nd inst.:—"Have cut number thirteen main ore body with the two western development drives. Width so far exposed twenty-two feet, with ore still going in on south side. Height eleven feet, with tin still in roof. Value, average grade, rich on footwall. Course of ore body due west, dip thirty degrees. Assuming this as average course and dip, distance to boundary sixteen hundred feet. Pushing work here with one machine drill and sixteen hammer boys, working three eight hour shifts."

Worcester Exploration.

The Worcester Exploration and Gold Mining Company's report for April reads as follows: Tonnage crushed, 5,250; mill running time, 28·12 days; yield from mill, 978·197 ozs.; yield from cyanide, 381·184 ozs.; total yield, 1,359·383 ozs. of fine gold, valued at £5,743 7s. 10d.; approximate profit, £2,000.

Glynn's Lydenburg.

The output of the Glynn's Lydenburg mine for April was as follows: Tons crushed 3,005, yielding 1,706 ozs. fine gold, valued at £7,233; total value of month's output, £7,233; estimated profit for month, £3,344. The decrease in profit was due to increased expenditure in werf mynpacht.

SHAFT-SINKING PROGRESS ON THE FAR EAST.

Record Sinking on the Modderfontein Deeper Deeps—Government Areas and Modder Deep Nearing the Reef—Rand Klip Struggling Bravely Along.

THE record footages that are being made in those shafts in the far east, which are being pushed down with increasing vigour towards the, as yet unexplored, reef bodies of the Government Gold Mining Areas and the Modderfontein Deep, remind us that within a very few days the first shaft to reach the deeper levels far to the south of the Modder fontein outcrop will have told the tale that is being anxiously awaited. At the Modderfontein Deep, the consulting engineer of the company has estimated the reef should be struck in the neighbourhood of 2,750 feet from the surface, and at the end of last month the depth attained in the No. 1 shaft, the deeper of the two being sunk, was 2,521 feet, and in the No. 2 shaft 2,339 feet. It was in the latter that the remarkable sinking record referred to in our previous issue was made last month. The record, it may be mentioned again, was 234 feet, or nearly 60 feet per week. News may be received almost any day that the anxiously looked for reef series has been reached. The speed of the work of exploration has been much facilitated by the fact that the No. 1 and No. 2 shafts are within 100 feet of each other, and are connected by cross-cuts at 700 and 1,400 feet. An adequate pumping plant has been provided, so that no delay has been experienced on this score. The saving in the cost of sinking which has been effected by the method of twin shafts is expected to amount to at least £1,500, for the average cost of the footage sunk to the end of last year was £20 15s. 9d. per foot, including the cost of timbering and pumping. As explained last week, the shafts are of three compartments each. It is impossible to say, of course, what values are likely to be found at the bottom, but at the last annual meeting Mr. H. Neuhaus said to the shareholders: "As to the prospects, I can only repeat what I stated a year ago, namely, that I think, in view of the developments on the surrounding properties, there is every hope of proving the existence of a large quantity of valuable ore in your block of claims."

GOVERNMENT MINING AREAS.

At the Government Mining Areas, also, some record sinking has been done, and the honour of holding the record of the Rand in shaft sinking, if not of the world, which was only wrested from it last month by the Modder Deep, may again be recovered. At the 26th April the north-east shaft had attained a depth of 1,887 feet, the north-west shaft a depth of 2,180 feet, the south-east shaft 2,165 feet, and the south-west shaft 1,128 feet. The erection of two 50-drill air compressors has been completed, and although difficulty has been caused by inflows of water in the two northern shafts, the work is being pushed on at a satisfactory speed generally. It was in the south-east shaft that the record of 233 feet in March was accomplished, a shaft of seven compartments, the excavation being 45 feet by 10 feet, or equal to 37·5 tons to the foot on the solid. The compartment sizes are 8ft. 6in. in the clear for the pump compartment, and 6ft. 6in in the clear for the other six compartments. The pump compartment comprises a 2ft. 8in. ladderway, 3ft. 6in. space for repairing cage, and 2ft. 4in. for pipe and columns. The power cables are carried down in the space between the wall plates and the repairing cage ends. In the shafts in the northern line, the reef series is expected to be met with at a depth of 2,100 to 2,200 feet from the surface, and in the southern shafts at a depth of about 3,200 feet. Here also, then, the striking of the reef horizon can be only a matter of a few days, and another great problem, that of the economic value of a vast area between the deep levels of the New Modderfontein and Geduld, three miles or so to the east, will be brought within the reach of investigation upon a practical working scale.

SPRINGS MINES.

The progress of the Springs Mines, another important portion of the unknown reef area of the far east, was discussed by the chairman, Mr. J. G. Hamilton, at the meeting held on the 30th ult. The north shaft, according to the latest information then available, had reached a depth of 2,211 feet, while the south shaft at the same date, the 29th April, had been pushed down as far as 1,742 feet from the surface. If no unexpected difficulties are encountered, it is anticipated that the reef series will be met with in the north shaft, at any rate, before the end of the present year. This is the most southerly of all the areas where opening up is in progress, the distance of the shafts from the out crop of the reef series on Modder B. being, roughly, five miles, or about 27,000 feet, on the dip. The values to be met with at this depth should go far to decide the much discussed problem of the deterioration of the grade of the banket ore in the deep deep levels. We have heard a great deal of late of what Mr. Hellman is supposed to have said, and a great deal more of what other engineers are alleged to believe with regard to the rapid depreciation of the Rand's gold assets beyond the limits of existing deep level mines, but the evidence of a mine at a distance of five miles from the outcrop, along the dip, should be fairly conclusive, whatever conclusions may be drawn from the evidence obtained within the two mile range. The evidence of such properties as Brakpan, where reef of excellent quality is being worked at a depth many thousands of feet beyond the experience of Mr. Hellman, should be sufficient to indicate the necessity of an open mind, at least, upon the subject. It will be interesting, however, to observe the attitude of the pessimists if the anticipations of the directors of the Springs Mines are fulfilled.

RAND KLIP.

At the Rand Klip, the most north-easterly point at which the process of opening up the reef series is in progress, things have been greatly hampered by almost every kind of difficulty which can beset the shaft-sinker, chief among them being bad ground and heavy inflows of water. These troubles, however, have been largely overcome, and better speed is being attained. At the end of last month the depth of the eastern shaft was 1,699 feet, out of a probable total depth of about 1,850 feet.

Transvaal G.M. Estates.

The output from the Transvaal Gold Mining Estates mines for April was as follows:—Central Mines: Tons crushed 10,500, yielding 8,753 ozs. fine gold, valued at £36,756. Elandsdrift Mine: Tons crushed, 590, yielding 635 ozs. fine gold, valued at £2,663. Vaalhoek Mine: Tons crushed 1,066, yielding 351 ozs. fine gold, valued at £1,499. Total value of month's output, £40,918; estimated profit for the month, £22,483. The grade of ore crushed in April was abnormally high, owing to the necessity of working out immediately a rich pocket struck at Broken Hill.

Brakpan Mines.

The April output of the Brakpan Mines was as follows: Stamps working, 115; running time, 29 days; ore crushed, 48,173 tons; tube mills working, 6; ore hoisted, 54,625 tons; ore from dump, 1,320 tons; waste sorted, 15·32 per cent.; fine gold declared, 17,443 ozs.; value declared, £73,314, equal to 30s. 5d. per ton milled; working costs, £42,365, equal to 17s. 7d. per ton milled; working profit, £30,949, equal to 12s. 10d. per ton milled. In addition to the above, the reserve gold, 3,800 fine ozs., value £15,973 9s,, has been declared.

STRIKING FEATURES OF THE LATEST RETURNS.

The Average Grade of the Village Deep—Nourse Mines Higher than Normal—Princess Estate Making Headway.

Some rather striking figures characterise the declarations received by the Chamber of Mines in connection with the April output. Among those which will attract attention are, without doubt, the returns of the Village Deep, which show a recovery of £70,038 for the month, as against one of £78,061 for March, and an average of about £70,000 for several previous months. A note is given to the effect that "the reduced profit is due to the lower tonnage crushed, and an instruction to the management to keep the grade milled approximately the average value of the ore reserves." The tonnage crushed was 49,200, or some 2,000 tons less than in March. The recovery has been increasing noticeably lately, but, although it averaged 30s. 6d. in March, it was not much lower in February—30s. 1d., to be precise—whereas six months ago it was 27s. 6d. According to the official estimate, the value of the 2,159,792 tons of payable ore reserve at the end of 1911 was 6·1 dwts., over milling width, presumably, equal to, say, 26s. On a 95 per cent. recovery basis, the returns would be 24·7s., and the point of the explanation given above is, therefore, quite obvious. As far as we are aware, it is the first occasion upon which any mining group has publicly drawn attention to the fact that the grade of ore of its mines has been unduly high. The recent case of Modder B. may suggest itself as a precedent, but it is not altogether similar, inasmuch as the high grade temporarily put through the mill was, as explained, unavoidable. It is interesting to note, by the way, that in addition to the profits declared to the end of February, the Village Deep had a gold reserve amounting to £24,755, which was extinguished by being included in the total profits of March. Like the man on the poster, then, the company has been "going strong."

The Nourse Recovery.

The Nourse Mines is another company which is singled out for directorial comment, and it is announced that "the recovery per ton was abnormally high for the month of April," and that "it is not expected that it will be maintained at that rate." The recovery amounted to £82,779 as compared with £80,928 in March, and £76,799 in the previous month. The tonnages crushed in March and April were 53,000 and 51,400, figures which accentuate the higher recovery of last month. The recovery on 51,100 tons in February was £76,799, or 29s. 7d. per ton. The ore reserves of the company at the last published valuation were worth 6·6 dwts. The Board are to be commended, as in the last instance, for their candid attitude, as shown in the statement that the recovery value is not to be regarded as being at a normal figure. It is not uncommon to hear that improvements are to be expected in the returns of one mine or another, but information of an adverse nature seems to be generally considered undesirable in the interest of shareholders. The example given by the Eckstein group, however, is one that may well be followed generally. The Crown Mines gold revenue has fallen from £257,881 in March to £244,193 in April, and the quartz crushed from 161,500 to 149,500 tons. Working costs, moreover, are higher than they have been lately, and this is explained by the unsatisfactory character and fluctuating number of the labour force. These are conditions which affect large mines to a marked degree, and are, naturally, more emphasised in the case of an undertaking like the Crown Mines, which has not yet got into its stride. The City Deep profits have risen appreciably in the month from £20,462 to £22,417, although costs have been higher than usual.

Some Albu Mines.

Among mines of the Albu group we find the Meyer and Charlton keeping up the excellent profit of March by a return of £17,488 under this head. The New Goch, on the other hand, shows a profit of £2,951 for April, as compared with £3,966 for March, and £9,083 some six months ago. Van Ryn, with costs at 14s. 10·8d., as against 12s. 7d. in March, and an average of less than 13s. for previous months, shows a profit of £22,813 in April, compared with one of £25,051 in the previous month. At the West Rand Consolidated profits are being improved again, the figure for April being £5,188, whereas in February it was as low as £2,707. Of mines of the Goerz group, the Princess Estate shows improvement, inasmuch as the monthly working losses incurred during the transition period are being rapidly reduced, the loss in April being only £461, as against £1,772 in March, and £2,526 in January. At the Lancaster West a breakdown of the mill engine transformed the usual modest profit into a loss of £1,437, but the defect has been remedied, and the results for May will, it is announced, be unaffected by the breakdown. With regard to the Princess Estate, by the way, it may be added that the last quarterly report, to end of March, states that "sufficient labour has been obtained, which is expected to become rapidly efficient and the absorption of gold by the plates and the tube-mills has practically ceased." These have been the chief troubles of the company since the recent starting up of the centralised and re-arranged plant, and the effect of the more favourable conditions may be expected, no doubt, to become more apparent day by day.

Zaaiplaats Tin Mining Co.

A further interim dividend of 25 per cent. has been declared by the directors, and will be paid as soon as possible after the first day of June, to all shareholders registered in the books of the company on the 30th of April. In accordance with the policy hitherto carried out by the board, the capital expenditure this year will be met out of profits. This expenditure will amount to about £30,000, which includes extra power plant, additions to the mill, slimes plant and calcining plant, which, when completed, the directors anticipate will be the means of increasing the output. Arrangements have been practically completed to lease from the Transvaal Consolidated Lands portion of the farm Roodepoort, adjoining the company's property.

The following were the results from the operations on the Zaaiplaats Tin Mine for the month of April: Mill ran, 28·5 days; tons ore crushed, 2,640; duty per stamp per 24 hours, 6·175 tons; average yield concentrates, 5 per cent.; concentrates won, 132 tons; estimated average value concentrates, 68 per cent. tin; estimated working costs (including mining, milling, tramming, concentrating and drying of concentrates, but not including realisation costs), £3,100; total profit £10,000, not allowing for Government profit tax; total development risen, driven and sunk, 459 feet; tons ore mined, 3,200. The main feature of the month's work has been the picking up of the main ore body at No. 13, and at No. 2 pipe, where mining was discontinued about four years ago. This working has been dewatered, and the pipe, which had been faulted into the hanging wall, has been located. It is four by six feet, of average grade, the total depth being 170 feet.

The E.R.P.M. April Output.

During April 820 stamps milled 157,500 tons. The yield was 63,032 ozs. of fine gold, and the profit for the month £98,596. Profits: January, £67,108; February, £75,609; March, £101,362; April, £98,596.

GRADE AND RECOVERY.

The Danger of Over-grading—Variation of the Assay Plan Factor—The Possibility of Improvement in declaring Reserves.

The question of the relationship between grade and recovery has been more than once brought into prominence lately, not for the first time, by any means, and not infrequently instances have been quoted of mines which are working above what is considered to be their normal grade. In the report of Mr. H. Ross Skinner upon the working policy of the East Rand Proprietary Mines, as gathered by him from the mine records, the result of paying insufficient attention to grading requirements was strikingly illustrated. "From investigations made," he remarked, "it would appear that during 1911 at least 205,000 tons of rock were mined of an average value of under 1·9 dwts., from developed blocks of an original value of 2·5 dwts. and under; that from surface dumps 36,426 tons of low value were milled; and that during 1910 and 1911, about half in each year, 78,000 tons of waste filling are estimated to have been withdrawn from mine stopes. Such methods naturally resulted in obtaining a low working cost, but the penalty paid has been the rapid exhaustion of ore blocks of higher value, so as to maintain grade." The average shareholder probably knows little of the economics of mining, but a statement of this kind should be abundantly clear to him. It is obvious, for instance, that if, say, ten tons of 2 dwt. rock are milled it takes a similar quantity of 10 dwt. ore to bring the whole up to an average milling grade of 6 dwt. If an undue proportion of low grade rock be sent to the mill, and the process be continued for a considerable period, the necessity of mining an unfair proportion of high-grade ore in order to keep up profits—and appearances—may easily exhaust the payable assets of a mine and expose the undertaking to the danger of a sudden standstill whenever labour conditions or other circumstances may make development work more difficult than usual. The milling of ore of a higher grade than that of the estimated reserves is not a sign that the grade of the reserves is being diminished, but it is bad policy to take the fullest advantage even of a windfall in the shape of improved values in any particular section. The importance of keeping within the safe limits of a carefully calculated average value is evidenced by the fact that the Eckstein group, as remarked in another part of this issue, have taken care to explain sundry departures from the normal recovery which are not expected to be permanent.

THE ASSAY PLAN FACTOR.

The fact that ore reserve values are estimated with the closest possible precision over a reef thickness does not imply that it is possible to calculate the milling value to an equally reliable degree until practical recovery operations have been carried out for a reasonable period. This is a point which is referred to in the annual report of the Benoni Consolidated Gold Mines, where the consulting engineer discusses the question of the limit of payability. "In my opinion," he says, "the limit of payability in calculating the ore reserves should have been fixed at not less than 5 dwts. on a milling basis, my reasons being as follows:—(1) Until the mill has been milling on a full basis for at least six months it is extremely difficult to form any opinion of the ratio between the mine assay plan values and the actual stope tons values. It is only in this way that an accurate assay plan factor can be worked out which can then be applied in the ordinary manner. (2) The approximate average of working costs on these fields at the present time is about 20s. Ore which will not yield more than 20s. is, therefore, being worked at a loss. Five dwts. ore will, under ordinary circumstances, give a yield of 20s. (3) Until the assay plan factor has been arrived at accurately, and until a sufficient length of time has supervened for one to be able to state definitely what working costs at your mine are going to be, it is not, in my opinion, safe to take the margin of payability under 5 dwts. on a milling basis." The assay plan factor is the factor which shows the relationship between stope values of a reef and milling value, and it can easily be understood that until some knowledge is gained of the breaking characteristics of an ore body and the percentage of waste that may be expected to be sent to the mill, the bare statement of average reef values is inadequate as a forecast of recovery, even assuming that the results of the metallurgical operations can be calculated very closely. A comparison of the reserve values and recovery values of the various mines of the Rand will make it evident that the assay plan factor is far from being even approximately uniform from one end of the line of reef to the other. For this reason it seems desirable that a more precise method of stating the value of a mine's assets in the shape of ore reserves should be employed than that which largely prevails of giving the figures as stoping tons and values. A stoping ton has no very definite meaning, unless it be accompanied by an explanation as to the average amount of sorting reckoned upon, and the value given is susceptible to variation within fairly wide limits when it comes to recovery.

That considerable difference of practice prevails in the manner of stating ore reserves and their values may be observed in the annual reports of Rand companies. Some are milling tons, others stoping tons over a specified width, the quantity of waste included not being mentioned, while others again are just tonnage, whether stoping or milling is left to the imagination. Presumably they are milling tons, and the values are then what may be expected in the mill bins. It would, nevertheless, save a great deal of speculation on the part of the shareholder if more light were thrown upon the point. Since the public have assumed a critical mood, reasonably or otherwise, the question of improvement in method of declaring ore reserve assets is one that might, perhaps, be considered with advantage. One gratifying feature of the existing methods that it is only fair to point out is the care which is generally taken to be accurate in the matter of actual quantity of ore, and to be explicit as to the extent to which it has been developed or laid open for estimating purposes.

Kolmanskop Diamonds.

The output of diamonds from the Kolmanskop property at Luderitzbucht for the month of April was 10,148 carats.

New Kleinfontein.

The following cable has been despatched this week to the London office of the New Kleinfontein Company, Ltd., giving particulars of results of operations at the property for the month of April:—"Stamps run, 220; tons milled, 38,900; output, 12,888 fine ounces; value, less cost of realisation, £53,986; working costs, £37,974; working costs per ton, 19s. 6d.; profit, £16,012; capital expenditure, £16,455."

Jumpers G.M. Co.

The following cable has been despatched to-day to the London agency of the Jumpers Gold Mining Co.—"The following is the result of the joint working of the Jumpers and Treasury Mines during the last month:—80 stamps working 25 days, crushed 7,910 tons, yielding 2,084 ounces of fine gold from mill, 1,051 ounces of fine gold from tailings by cyanide, 345 ounces of fine gold from current slimes, and 165 ounces of fine gold from accumulated slimes; total from all sources, 3,645 ounces of fine gold. Value of output, £15,310. Joint profit for the month, £1,543. Position of joint gold reserves at end of last month, 1,371 ounces of fine gold."

THE NEED FOR ECONOMY ON THE RAND.

Some Conclusions Based on Recent Official Figures.

[From a Correspondent.]

The speech of Mr. Honnold at the dinner of the South African Institute of Engineers, when proposing the toast of the Mining Industry, supplies material for reflection on the present condition of the mining industry of the Rand. The surrounding conditions at the time of the speech, perhaps, required that the mining industry should, as stated, be toasted in a hopeful spirit, but whether Rand mining can also be considered in as perfect a state potentially as has ever been done, must largely depend upon our consulting mining engineers in advising on the future mining policy. Now, the average grade for last year was stated to be 7d. per ton below that of the previous year, and of this decline fourpence was considered to be due to a scramble for tonnage at one group of mines, whilst it was also claimed that there was convincing evidence that a similar mistaken policy at other mines had led to a further lowering of the grade at least equivalent to the remainder of the drop in grade during 1911. Under these circumstances, it was pointed out that there was no evidence of intrinsic decline in grade, but that during the current year there would probably be a distinct improvement. In the light of the constant fall of grade that has occurred every year for the last ten years on the Rand, during which period statistics show that the total decline has been in the neighbourhood of 14s. a ton, most engineers will require the strongest proof before being convinced that during last year there was no real decline in the Rand grade.

It must be admitted that to take the grade milled by itself as an indication of the probable profit-earning capacities of the Rand would be a misleading method of calculation, and, as all mining engineers know, nothing is easier on the Rand than the manipulation of the grade of ore sent to the mill. For this reason, little importance should be attached to the grade so long as it approximates to the estimated average value of the ore reserves, but, of course, any marked departure from these estimates should immediately demand explanation. As has been so frequently pointed out, it is the difference between the working cost and the grade—in other words, profit—that should count, and so long as costs decline in equal proportion with the grade the fall of the latter will be nullified, whilst, should an increased tonnage be dealt with at any individual mine, then the profits ought certainly to be higher. It is due to the fact that during the last ten years, whilst the average grade on the Rand has fallen 14s., engineers have only been able to lower the costs by 7s. 9d., so that there is a deficiency of 6s. 3d. per ton to be made up from somewhere; or, in other words, the working costs at the end of last year ought to have averaged, at most, 12s., instead of 18s., per ton. The question mining engineers and mine managers have to solve is how this is to be done. Hiding behind a manipulation of the grade may bring temporary relief to the mine manager as far as profit worries are concerned, so long as the working costs are not unduly inflated, but it is to the consulting engineer that the directors look for the mine to be worked on such lines as will best coincide with its permanent value as a profit-earning machine, so that the remarks of Mr. Honnold on grades, working costs, and dividends are of obvious importance.

There was one marked feature of interest in Mr. Honnold's speech, where he referred to some of the factors involved in the question of working costs having both a positive and negative bearing. It was noticeable, however, that whilst the positive factors were largely dilated upon and explained, the negative factors were lightly skipped over. Amongst the positive factors was the assertion that charges had been included in the working costs, which, in a better state of financial affairs, would have been placed against capital. Such a practice, if it does exist, ought not to be countenanced, on the ground that it destroys the value of working costs for purposes of comparison. There are many other ways in which similar ends may be attained, but it is always best to keep the working costs free from any abnormal charges, so as to preserve their value untainted for purposes of comparison. Another positive factor mentioned was the alteration due to change of power conditions and the transition state of some of the amalgamations. Undoubtedly the changes over from steam to electric power, and in some cases back again to steam, have added slightly to the costs, but, on the other hand, it is claimed that electrical power has proved cheaper than steam, whilst both are only of a temporary drawback, and do not call for lengthy explanation. Perhaps the most convincing positive factor in the increase of working costs is that of a material increase in the expense of native labour, and as long as this is made a question of supply and demand by the mining groups, so long will it be liable to vary, hence engineers can scarcely be held responsible for the increase in working costs due to this cause.

When we come to deal with the negative factors lightly touched upon, we find that, in the case of the factor of abuse of the low cost principle, its full disadvantage on the grade was pointed out without, at the same time, its benefit on working costs being amplified. The abuse of the principle of low working costs was charged with having lowered the average grade for the whole of the Rand by fourpence per ton in one single important instance. It is evident that it reduced the average working costs of the whole of the Rand by at least threepence per ton, so that, had this single instance of the abuse of the low working cost principle never occurred, the working costs for 1911 would have been 18s. 3d. per ton, instead of 18s. If similar instances of mistaken policy will account for the balance in the loss of grade, then, had this mistaken policy not have been practised, probably the total costs for 1911 would have averaged 18s. 5d. per ton. Then the sane application of what is called selective mining also increased the average working cost, so that, after all, the abuse of the principle of low working costs in 1911 had only a trifling effect on the profits. In what way, then, can profits be restored to a satisfactory level? In 1909, 20,543,759 tons were crushed for a total profit of £11,791,376, and in 1911 the crushing of 23,888,260 tons only produced a total profit of £11,414,861, so that, despite the larger tonnage crushed, the total profits were materially lower. Now, Mr. Honnold stated that, as regards grade, there was no evidence of intrinsic decline during the past year, and that, personally, he would not be surprised if this year should show distinct improvement. Owing to several good graded properties having been started during last year, one would naturally expect to see such an improvement, and let us compare the figures of December and March, to see how we stand:—

	December, 1911.	March, 1912.
Grade per ton	27/11	28/1
Working costs per ton ...	18/5	18/11
Working profits per ton ...	9/6	9/2

The working profits shown above are obtained by deducting the costs from the grade, but if the official figures of the profits were quoted, the results would appear much worse. We find that, whilst the average grade has so far this year been increased by twopence, the working costs per ton have averaged an increase of sixpence, so that, despite the increased grade, the profits have fallen by no less than fourpence per ton. Whatever consolation consulting engineers and mine managers can find in an increased grade under these circumstances, they will no doubt be quite entitled to. The solution seems to be in working costs rather than grade, and it is clear that these cannot be reduced effectually without a greater observance of economy, which fortunately from present indications is now occupying the close attention of all concerned.

ROBERTS VICTOR DIAMONDS: CONSULTING ENGINEER'S REPORT

A Concise Review of the Position.

In the course of his annual report, the Consulting Engineer of the Roberts Victor writes, :—The following is an outline of the work done on your property since the date of the last annual report :—Mine : The chambering of blue ground has been carried on from the 194 feet to the 314 feet levels, and all the available payable ground above the latter level has been extracted. At the present time about 13,000 loads of blue still remain dumped at the surface; this will be washed at the rate of about 500 loads per day until it is exhausted. During the period referred to, some 4,600 feet of driving and sinking has been accomplished. The following statement gives the details of this development work :—314 feet level : South-west of air shaft, drives 665 feet; north-west of air shaft, drives 215 feet; No. 1 mine, drives 188 feet. 394 feet level : Fissure (drives), 2,423 feet; winze from 314 feet to 394 feet level (drives), 80 feet; new area (drives), 345 feet; 634 feet level (drives), 299 feet; air shaft (sinking), 124 feet; 100 feet level, new area (drives), 75 feet; No. 35 shaft and drives (drives), 81 feet; No. 36 shaft and drives (drives), 71 feet. Total, 4,596 feet. The area of the fissure which has been opened up on the 394 feet level from the old mine equals about 34.5 claims. Plan No. 2683, which is attached hereto, gives the particulars of the development, and the values obtained from the test washings. It will be noticed that the area forms a long, irregular figure, extending over a length of about 600 feet, and averaging about 60 feet in width. The values, according to the test washings, appear to increase fairly consistently from north-east to south-west, the average of the whole number of tests, representing 2,959 loads washed, being 30 carats per 100 loads, valued at 19s. per carat throughout. The value per load on the above basis would be about 5s. 8d., and, as the working costs on a body of this kind could not be less than 7s. 6d. or 8s. per load, this part of the mine must be considered unpayable. Should the narrow, and richer part of the fissure, only, be worked, the costs would be considerably increased, and the prospects would not be improved to any appreciable extent. 514 feet and 634 feet levels : This part of the mine was de-watered. No development was done on the 514 feet level during the year. On the 634 feet level a certain amount of driving was carried out; this is shown on Plan No. 2681. The development throughout was in ground of a dirty nature containing a very large proportion of huge boulders, estimated at 50 per cent. or 60 per cent. of the whole. The area exposed by the development on this level equals 4.2 claims. From it 430 loads were washed, yielding 230 carats, equal to 53.4 carats per 100 loads, but the diamonds were not of high quality. A large quantity of water was encountered during the progress of the work, and there is every indication that the quantity would increase with greater depth. All mining operations have now been suspended in the mine. The electrically driven pumps at the bottom of the No. 1 shaft are still in position, and the water is being kept down to the 314 feet level. No. 1 shaft : The later chambering operations caused a considerable subsidence of ground in the immediate vicinity of this shaft, but so far the shaft itself has not been affected. With a view to protecting the shaft as far as possible—in case it should at any future time be required—waste ground is now being filled into the subsided area. 314 feet level under No. 1 area : The development done here is shown on Plan No. 2681. This work exposed two or three small fissures or veins of very dirty blue ground, which were so largely mixed with shale, etc., as to render it impossible to get sufficient blue ground. To further prove this part of the mine, a winze was sunk from the 314 feet level to the 394 feet level; the plan previously referred to showing the development at the latter level. 394 feet level, No. 1 area : In this case also the fissure was found to be most irregular and broken, and, although the body of blue was of larger dimensions than in the level above, it was of the same dirty character. 652 loads of ground picked out from the drives yielded from the test washing 132¼ carats, or 20.3 carats per 100 loads. On this basis this area is also unpayable. In view of the foregoing results it was decided to discontinue work in this section of the mine. No. 1 area (surface) : From this area about 112,000 loads of tailings and overburden have been removed, and 71,859 loads of yellow ground have been extracted. The area of yellow ground exposed at the 60 feet level equals 19.3 claims. There is reason to believe that the area of the fissure will be considerably increased to the north and south, in both of which directions the stripping of overburden is being carried on. In all probability the areas Nos. 1 and 2 will be found to connect, but the width of the fissure between the two points has not yet been determined. At the present time, yellow ground is being extracted down to the 80 feet level, and preparations are being made to carry the opencast workings down to a depth of 150 feet. The decomposed nature of the shale walls necessitates the removal of a very large quantity of overburden. The estimated quantity of yellow remaining (in January) in the Nos. 1 area down to the 100 feet level—without allowing for any longitudinal extension of the fissure—is calculated at 37,000 loads, and from the 100 feet to the 150 feet levels—taking the area at 10 claims—at 43,000 loads. The ground in this neighbourhood should yield from 40 to 50 carats per 100 loads. No. 2 area : From this area about 58,000 loads of tailings and overburden have been removed, exposing yellow ground over an extent of 4 claims. At this point the fissure appears to be widening out at the 40 feet level, and there is every reason to believe that it will be found to connect with the No. 1 area, which is situated about 800 feet to the north-east. Should this prove to be the case, a very large quantity of yellow ground will be available if the fissure maintains a working width. The yellow ground exposed in the lower part of this area is precisely similar in appearance to that now being got from the No. 1 area, and will probably prove to be equally valuable. Within the next wesek or two, sufficient ground should be available for the test washing. The re-installation of the grease tables has proved of great benefit to the company, and besides reducing the number of sorters required, has tended to improve the recovery of diamonds in several ways. The machinery and plant have been maintained in a high state of efficiency during the year. In conclusion, I beg to say that I consider great credit is due to Mr. Parsley for the able and energetic manner in which the company's affairs have been handled during his term of management.

The Diamond Market.

A message from Berlin states that the Reichstag has considered the Damaraland estimates. The Budget Committee presented a resolution demanding that the Diamond Regie Co. be reformed, and stating that the diamond producers had been consulted as to the closer state of supervision introduced into the resolution. Herr Hoch, a Socialist member, in his speech, affirmed that the diamond business carried on through De Beers, had been successful. He asserted that the Regie carried on a dirty competition by forcing down the prices of raw stones, by flooding the market with them. Subsequent speakers regretted that the Colonial Secretary, through the new agreement, had placed himself in the hands of a Belgian Syndicate, but they welcomed the substitution of the net for the gross tax. Herr Solf maintained that the new agreement, which caused a rise of three and four marks per carat in the price of diamonds, afforded a guarantee for an increase of capital, and said :—" We have been in negotiation with De Beers, and other dealers in London, Amsterdam and Antwerp, on the subject of free competition for the sale of diamonds, but none of them are prepared to accept the market risks entailed. The German market can only absorb 80,000 carats, and we are obliged to dispose of 90,000 carats abroad. The Regie Company had worked splendidly, but they must reorganise, so that the producers have voices in their operations." Herr Solf thereupon agreed to the resolution of the Committee.

Geduld Proprietary.

The salient points of the report of the Geduld Proprietary Mine for the March quarter are : Number of tons milled, 40,830; revenue from gold, £54.191 : working expenses, £43,660; cost per ton milled, 21s. 4.636d. ; working profit for the quarter, £10.834; profit per ton milled, 5s. 3.681d. : sundry revenue, £1563; capital charges, debenture charges and interest, £720; debit balance of mining development charges, £9,161; balance profit for the quarter, £2.313. Mine development, driving, winzes, raises, crosscuts, 3.418.5 feet. For the three months ended March 31 the footage sampled on the reef totalled 2.635 feet, the assay values of which are as follows :—No. 2 shaft : North drive No. 1, 150 feet sampled 3.9 dwt. over 10.2 inches : south, drive No. 1, 120 feet sampled 2.0 dwt. over 16.2 inches; north drive No. 2, 300 feet sampled 37.9 dwt. over 7.8 inches; south drive No. 2, 355 feet sampled 17.7 dwt. over 25.0 inches; north raise No. 1 from north drive No. 2, 235 feet sampled 55.9 dwt. over 7.4 inches; north winze No. 1 from north drive No. 2 70 feet sampled 51.9 dwt. over 11.4 inches; south raise No. 1 from south drive No. 2, 75 feet sampled 16.7 dwt. over 24.2 inches : south raise No. 4, 185 feet sampled 7.1 dwt. over 51.5 inches; south drive, 95 feet sampled 4.4 dwt. over 15.1 inches; south raise No. 3, 135 feet sampled 3.5 dwt. over 21.8 inches; B level north from north raise No. 2, 225 feet sampled 17.4 dwt. over 22.1 inches; B level south from north raise No. 2, 160 feet sampled 2.7 dwt. over 19.1 inches; B level north from north raise No. 3, 45 feet sampled 4.3 dwt. over 25.7 inches; B level south from north raise No. 3, 65 feet sampled 6.3 dwt. over 15.8 inches; A level, raise No. 1 (a), 30 feet sampled 4.3 dwt. over 26.5 inches; A level, raise No. 1, 150 feet sampled 34.5 dwt. over 22.4 inches; A level crosscut from raise No. 1, 10 feet sampled 28.4 dwt. over 20.5 inches; A level south from north raise No. 3, 30 feet sampled 10.8 dwt. over 19.1 inches; north raise No. 3, 170 feet sampled 5.3 dwt. over 23.3 inches; north raise No. 4, 30 feet sampled 1.5 dwt. over 9.3 inches.

FINE GRINDING.

The Need for the Tube-Mill—The Economic Limit of Fineness—Gold in Pyritic Particles.

In the course of an interesting chapter on tube-milling in "A Text-Book of Rand Metallurgical Practice," Mr. W. R. Dowling explains the necessity of fine crushing outside the stamp mill as follows:—

Although the economic limit of fineness of crushing banket ore has not been universally reached, the gradings and values of sand residues give useful information on this point. The degree of fineness of crushing necessary to expose the gold varies with the depth of the mine and with the particular district in which it is situated. The greater the depth from which the ore is mined the finer crushing it requires to expose the gold, and finer crushing is likewise necessary in order to obtain the same residue from a richer as from a poorer ore. From this it follows that the percentage recovery which yields the maximum profits rises with the value of the ore. Present data points to the economic limit of fine crushing being reached when 90 per cent. of the final product is fine enough to pass a 90-mesh screen (·006 inch aperture), which would afford with good classification about equal tonnages of sand and slime. This is far short of all sliming, but would allow 96 per cent. recovery on 8 dwt. ore. The practical limit of fine crushing in the stamp-mill alone with fine screening and high discharge is about 11 per cent. of +60 (·01 inch) grade in the screen pulp with a high percentage of slime. Modern practice usually requires a finer ultimate product than this to ensure the maximum profit per ton, and this may be obtained by using an adequate number of tube-mills whatever battery screening be employed. Stamps and tube-mills combined produce less slime than stamps only crushing very fine. This is due to the separation in the classifiers of fine particles where tube-mills are used, whereas in the stamp mill fine sand is not so readily discharged through the screen, and therefore undergoes further comminution, principally by the particles grinding against one another under the pressure of the stamp.

In tube-milling coarse sand to fine it is advisable to feed a large tonnage of sand and to re-classify the still coarse outflow, which should be at least as coarse as the screen pulp. By feeding up to 400 tons of sand per day there is an ample supply of coarse grains throughout the mill, so that there is little waste of power in grinding particles already fine enough. Particles of sand of 0·27 inch diameter passing a screen of nine holes per square inch appear to be the largest-sized grains which can be shattered by the falling pebbles in tube-mills as used on the Rand. Any fine ore fed into a mill which is too small to act as pebbles and too large to be shattered by the falling pebbles merely takes up useful room and consumes power.

Wherever tube-mills have been installed it has been found that amalgam accumulates in the launders of the tube-mill circuit. This is due to the continual separation by the classifiers of the finely divided amalgam scoured off the plates of the stamp and tube-mill. The gold liberated in the tube-mill by re-crushing of the coarse particles amalgamates with any mercury that may have escaped from the amalgamated plates, and such amalgam collects in the launder between the tube-mill outlet and the shaking tables.

Owing to their high specific gravity, any particles of metallic iron in the mill tailing pulp tend to accumulate in the tube-mill circuit. This material is objectionable, from its liability to cause choking in launders and banking on tables unless extra water is used, which in turn consumes power for re-elevation. Since over half a pound of iron may be worn from shoes and dies per ton of ore crushed, this amounts to several tons per month of iron particles in a large plant. The pulp in the tube-mill circuit may contain as much as 2½ per cent. of metallic iron per ton of solids, which represents a considerable waste of power to reduce by abrasion in the tube-mills and to elevate repeatedly until sufficiently fine to overflow the classifiers. Pending the introduction of an efficient magnetic separator for its removal from the tube-mill circuit, the excessive accumulation of iron may be prevented by by-passing the pulp in the tube-mill circuit direct to the cyanide works for a few minutes daily, although the disadvantages of such a remedy are obvious.

The profitable degree of reduction of banket ore depends chiefly on the distribution of the gold in the ore. The quartz pebbles, constituting a large proportion of the ore, are in themselves free from gold, but as they are embedded in the gold-bearing matrix, on crushing yield particles with adhering gold-bearing pyrite. The matrix itself, being mainly composed of silica, yields on crushing grains of quartz enveloping particles of gold. It is this fact which makes separation of the gold by concentration in a pyritic product incomplete.

W. A. Caldecott found that by careful panning of spitzlutte concentrate prior to tube-milling he could only separate 63·08 per cent. of the total gold in 18·2 per cent. by weight of the product, leaving 36·92 per cent. of the gold in the sandy portion (see Table IX.). This sandy portion assayed 6·25 dwt., and carried 12·2 per cent. of the total pyrite. In other words, although ⅞ of the total pyrite were removed, only 3-5 of the gold present was separated. He concluded that the surface fragments of pyrite adherent to the quartz grains are richer relatively than the massive crystals of pyrite from which they have been detached by crushing.

Table IX.—Spitzlutte Concentrate.

	Pyritic Portion.	Sandy Portion.	Total.
	Per Cent.	Per Cent.	Per Cent.
Percentage by weight ...	18·2	81·8	100·0
	Dwt.	Dwt.	Dwt.
Assay value per 2,000 lb. ton	48·0	6·25	13·85
	Per Cent.	Per Cent.	Per Cent.
Percentage of pyrite ...	49·50	1·53	10·26
Percentage of total gold in concentrate	63·08	36·92	100·0
Percentage of total pyrite in concentrate	87·8	12·2	100·0
	Dwt.	Dwt.	Dwt.
Dwt. fine gold per 1 per cent. of pyrite	0·97	4·09	1·35

A similar examination of a sand residue prior to the introduction of tube-milling was made. This disclosed that (see Table X.) 61·23 per cent. of the gold was concentrated in 5 per cent. of the product, still leaving 38·77 per cent. of the gold in the sandy portion. The separation in this case was made by floating off the sandy portion by means of a Sonnstadt solution having a specific gravity of 2·95.

Table X.—Sand Residue.

	Pyritic Portion.	Sandy Portion.	Total.
	Per Cent.	Per Cent.	Per Cent.
Percentage by weight ...	5·0	95·0	100·0
	Dwt.	Dwt.	Dwt.
Assay value per 2,000 lb. ton	10·8	0·36	0·882
	Per Cent.	Per Cent.	Per Cent.
Percentage of pyrite ...	48·4	·44	2·838
Percentage of total gold in residue per cent. ...	61·23	38·77	100·0
Percentage of total pyrite in residue	85·27	14·73	100·0
	Dwt.	Dwt.	Dwt.
Dwt. fine gold per 1 per cent. of pyrite	0·223	0·818	0·311

A sample of the same sand residue was separated by panning into pyritic and sandy portions, and from the gradings of these it appeared that 68·26 per cent. of the gold content still remained in the sandy portion, of which the larger proportion was in the coarse grains of +60 grade.

The foregoing experiments clearly show that although high-class concentrators, such as vanners and Wilfley tables, will separate a rich product in a comparatively small bulk, there still remains so large a proportion of the gold value in the remaining sandy portion that it cannot be discarded. Hence hydraulic classification, with re-crushing of the coarse product, is preferable to close concentration. In hydraulic classifiers the specifically heavier and richer particles of pyrite will sink, although smaller in diameter, as well as the larger particles of quartz. The pyritic particles requiring finer crushing to yield their gold are thus separated and subjected to finer comminution. The coarse siliceous particles, although not so rich, are likewise separated and finely crushed to detach rich pyritic fragments and to expose encased gold. The above conclusions were confirmed subsequently by researches on ore of widely varying districts of the Rand, and are now universally adopted in practice.

Roberts Victor Diamonds.

The output from the Roberts Victor Mine for the month of April was 7,018 carats of diamonds, recovered from 16,777 loads washed.

Klerksdorp Proprietary,

The directors' report of the Klerksdorp Proprietary Mines for the year ended December 31, 1911, states, *inter alia*:—The company's property consists of: (1) 397 claims situated on the Klerksdorp Commonage; (2) the lease for 99 years from 15th March, 1895, of the mineral rights of three portions of reserve ground, in extent 549 morgen, situated on the farm Palmietfontein No. 697, adjoining the Commonage; (3) one-fourth interest in three mynpachts, in extent 553 morgen, on the farm Elandsheuvel No. 376, adjoining the Commonage, together with an interest in three claims suitable for a water-right for these mynpachts. No work has been done by the company on any of the above properties during the past year. During the year a considerable amount of prospecting work was carried out on the 12 blocks of claims adjoining the property of the Cam and Motor Gold Mining Co., Ltd., in Rhodesia—an interest in which, you were informed in last year's report, had been acquired by the company. The results of this work, which extended over several months, were, however, of a very disappointing nature, as though the indications were considered excellent by the engineer who supervised the prospecting, no payable reef was located on the claims. Work was therefore closed down and the claims handed back to the owners. In common with other holders of shares, the company has suffered severely from the depreciation in its investments during the past year. So much so that it has been deemed advisable to set aside a sum of £8,980 2s. 8d. for contingencies under this head. In view of your large holding in the Main Reef West, Ltd., and the depreciation being of such a steady and prolonged nature—the shares dropping from 47s. at the beginning of last year to 25s. in January of this year—your board deemed it advisable in your interests to obtain the permission of the board of the Main Reef West, Ltd., to have an independent report made on their mine. This permission was granted, and Mr. F. H. P. Creswell, formerly the manager of the Village Main Reef Gold Mining Co., Ltd., was engaged by your board to thoroughly examine and report on the mine and recovery works. Mr. Creswell's report is of a most exhaustive nature, but the gist of it is to the effect that the drop in the share prices is not reflected by a falling-off in mine values, or, as Mr. Creswell puts it, "The large ore reserves and the general outlook underground justify one in regarding the Main Reef West, Ltd., as a mine which can pay, and should pay, a steady annual dividend of at least 25 per cent." and the shares of which on a 10 per cent. dividend basis might be fairly valued at from 40s. to 50s. From this your board feel justified in believing that the steady drop in the monthly profits of the Main Reef West, Ltd., will shortly cease, and that with a larger and more efficient supply of native labour—the want of which hitherto the directors of the Main Reef West, Ltd., assign as the cause of the fall off in the monthly profits—your company should benefit considerably in the near future by increased dividends and appreciation in the share values of this holding. As regards the other investments of the company, some of these have appreciated since the closing of the books, and a further improvement, it is hoped, can shortly be looked for,

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The River Diggers.

A correspondent of the *Diamond Fields Advertiser* writes:—

"I think it is about time that the digger, like the average worm, made a 'turn,' for he has been very frequently trodden upon lately, and looked to his industry. Firstly, there should be a certain amount of security from I.D.B. We have a few detectives stationed at different places along the River, but their first duty is to protect the mining industry in Kimberley, and very little is done for the digger. I would advocate a general trapping system, such as exists on the Rand for trapping I.G.B. and illicit liquor dealers, such detectives to make a speciality of River work alone, and to be supplied with a staff of trap boys, who could be removed all along the River Diggings at the discretion of the Department, so that they could not become known, say, working from Mooifontein down to Douglas and back. In the case under notice a week ago, the accused is reported to have said to the trap boy that he did not want Kimberley stones, but would take River diamonds. I leave the inference to be drawn by my fellow diggers. I think it is about time that the Minister of Justice gave effect to a resolution which was forwarded to him some time back bearing upon this matter. I would ask the 5,000 diggers from Mooifontein down to Schmidt's Drift to band themselves into a real live union, irrespective of parties, to work against the existing injustice and unfairness on the part of diamond buyers, who undoubtedly reap the full benefit of the diamond trade, and leave the diggers the crumbs to finance their digging operations with, and for the rest to starve on mealie pap. I defy any buyers on the River to say that they are paying a fair and equitable price for our finds."

Princess Estate and G.M. Co.

The directors of the Princess Estate report, inter alia, as follows on the operations for the March quarter:—Number of tons milled, 47,067; revenue from gold, £58,409; working expenses, £64,815; cost per ton milled, 27s. 6.5d.; working loss for quarter, £6,406; working loss per ton milled, 2s. 8.666d.; sundry revenue, £1,333; debenture charges and interest received, £924; capital expenditure for quarter, £10,475; balance loss for the quarter, £5,997. On mine development, 1,269.5 feet were driven, risen, sunk, etc. The footage driven, risen and sunk on the reef and sampled was as follows:—South Reef, 290 feet, averaging 7.12 dwt. over 24 inches; Main Reef, 662.5 feet, averaging 3.99 dwt. over 37.19 inches. It is estimated that the payable ore, based on the milling width, developed by the above footage is: South Reef, 10,516 tons; Main Reef, 1,903 tons; total, 12,419 tons. These figures are subject to recalculation at the end of the year, when block values are made out. The unsatisfactory results were due to the unavoidable dislocation on starting up the centralised and rearranged plant. Moreover, the new plant absorbed a considerable amount of gold, and the mine suffered severely by reason of an acute shortage of native labour. Sufficient labour has now been obtained, which is expected to become rapidly efficient, and the absorption of gold by the plates and the tube mills has practically ceased.

Van Ryn Deep.

The directors of the Van Ryn Deep report, for the quarter ending 31st March, 1912, that the east incline shaft was sunk 542 feet, to a total depth of 2,500 feet. The fifth level was started at 2,100 feet, so that the bottom of the shaft was 400 feet below the last level. Of the 542 feet sunk, 535 feet were on reef averaging 7.54 dwt. over 44.72 inches. At the west incline shaft the old air hoist has been replaced by a larger and faster engine. Recent development has indicated that the downthrow met with at the east incline will be much smaller at the west incline, and consequently it will not be necessary to steepen the shaft. This will be a great advantage, and the sinking of the west incline is now being pushed. The total footage driven, risen, and sunk, exclusive of shaft-sinking, amounted to 4,496 feet. The ore reserves were increased by 76,680 payable milling tons of an average value of 6.48 dwt., and at the end of the quarter the payable ore reserves stood at 680,396 milling tons of an average value of 7.06 dwt. A noteworthy point is that the reef exposed in the east incline is proving of satisfactory value. At the fourth level east the reef has just been intersected in a crosscut north, and gives a value of 71.65 dwt. over 6.3 inches for 25 feet of driving. No tonnage has been included in the reserves from this section as yet, but the indications are most encouraging.

THE LOWER WITWATERSRAND SYSTEM.

A Matter of Nomenclature—The Faulted Area West of Geldenhuis Mill—Alleged Identity of Rietfontein and Van Ryn Series.

At the last meeting of the Geological Society of South Africa, Mr. W. Bleloch submitted a further discussion or Dr. E. T. Mellor's paper on "The Lower Witwatersrand System on the Central Rand," and its connection with West Rand sections. The printed reply referred to below was published in our issue of the 27th April. He said:—

"I find that Dr. Mellor's printed reply to my contribution to the discussion on his paper contains considerably more than he delivered at the meeting, and there are some points I would like to clear up. Dr. Mellor says: Mr. Bleloch's Market Square-Fairview Series embraces what he, Dr. Mellor, includes under the term Hospital Hill Beds and the whole of the Jeppestown Series as well, and that, "without clear definition of the terms used discussion is rendered very difficult." I would point out that the term Jeppestown Series is a new one so far as I know in local geology, first used by Dr. Mellor to indicate those beds on Kensington Ridge named by the former exponents of the orthodox school as Hospital Hill Series and Doornfontein Shales or Doornfontein Beds. As for myself, I used the territorial term Market Square-Fairview Series in order to make quite clear which beds I referred to. I certainly include in that series the speckled bed, the striped and contorted shales, and the green quartzites which form the northern portion of the series and the beds which Dr. Mellor calls Jeppestown beds, which form the southern portion. This statement should do away with any difficulties of definition so far as my views are concerned. I stated at the last meeting that on three specific points, which I carefully set out in detail, Dr. Mellor confirmed, so far as I could judge, my previously published observations, and that without acknowledging my prior publication, although he must have been aware both from a debate in this Society and from other personal information, that I had noted and made these points. Dr. Mellor explains that he understood that these matters were generally recognised before, and that "the persistence of the Government Series throughout the Central Rand has been maintained by many engineers and geologists since the early days of the field," and that Drs. Hatch and Corstorphine "apparently overlooked" the beds at Kensington in question. The truth is that these geologists did not overlook these beds; they carefully mapped them in the sketch plan accompanying their paper* as Hospital Hill quartzites and Doornfontein shales. These identifications by Drs. Hatch and Corstorphine were allowed to go unchallenged in this Society, and so far as I know outside, until the publication of my treatise, it was, and is, as stated above, part and parcel of the orthodox theory that the Jeppestown Beds and the Doornfontein Beds are one and the same, and, although I now consider this opinion to be wrong, it is a consistent and conceivable idea far more acceptable to my mind than Dr. Mellor's new idea of splitting the Kensington Ridge into two and calling one part Hospital Hill Series and the other Government Reef Series. I am glad that beyond these three points above referred to Dr. Mellor has made a summary of my later views afresh so as to show that they are diametrically opposed to his own. The two conceptions are so completely different, and I have stated mine so clearly that one would have thought this re-statement unnecessary, but I welcome it because it gives me this opportunity of saying once more that I used to hold views similar to Dr. Mellor's fundamental conclusions, but that after testing them in many places I finally threw them over as worthless. Regarding the supposed faulting in the area west of Geldenhuis Mill, I have shown my reading on the small sketch plan drawn to scale, so that the issue is quite clear, and I welcome Dr. Mellor's invitation to members to inspect the place and map it for themselves; in fact, I will be glad to motor any member or members out to see the place. I contend that in the case of some of the beds supposed by Dr. Mellor to be faulted there is sufficient evidence visible to show that they are continuous across the supposed fault. Fortunately, there is one conspicuous though narrow band of white quartzite which outcrops distinctly on both sides of the little eroded valley, and the question is not one of thickness and number of beds on each side, as Dr. Mellor suggests, because there is a wider exposure on the east, but the simple matter of fact: Does this white quartzite bed with its accompanying shales continue across the supposed fault or not? Seeing that the Geological Survey presumably does not do any digging, but contents itself in such cases with surface observations and theoretical deductions only, I intend getting the owners' permission to uncover the white quartzite throughout. In case this bed and its accompanying shales north and south are found to go right through Dr. Mellor's fault, I take it he will have to find a different explanation. Seeing the importance of this disputed point, I intend having an accurate survey made of the area, which I will submit with a short note for your consideration at a later date. I cannot agree with Dr. Mellor that this is a trivial or minor matter. If in this specific case the alleged faulting does not exist, then doubt must be raised about the other faulting on a larger scale which Dr. Mellor has deduced from similar evidence, and, as I stated before, his identification of the striped and contorted shales (No. 2 on my sketch plan) as being the same as the striped and contorted shales to the north (No. 1 on my sketch plan) must be wrong, and one more buttress of the duplication theory must fall to the ground. Dr. Mellor advises those, presumably including Mr. Horwood and myself, who wish to establish the view that the Langerman's Kop Beds are normally interbedded in the Lower Witwatersrand System to give attention to the most important structural features exhibited by the district as a whole. or example: "The vertical and overtilted dips shown along the whole of the Kensington Ridge as far as Rietfontein and the sharp contrast these offer to the dips shown by the beds immediately north of the Rietfontein fault from Rietfontein on the east to Witpoortje on the west." I wish to say that the main structural features of this area have been fully and carefully observed for many years by many observers and that, as for myself, I find that the angle and direction of the dip of the beds pay little respect to the line of Dr. Mellor's supposed Rietfontein fault. For instance, from about the neighbourhood of the Scottish Monument eastwards there are exposures and outcrops of large pebble beds evidently belonging to the Langerman's Kop Series, some of which are actually interbedded in the most northerly shales belonging to Dr. Mellor's supposed duplicated Hospital Hill Shales. These banket beds are dipping for the most part either vertically or steeply to the north and are in every case dipping and striking conformably with the striped contorted shales and green quartzites immediately to the south. Exposures of these beds are not confined to one place, but can be seen at intervals for long stretches along the line, and some of the more southerly beds which develop between the shales and the green quartzites are to be seen as far as the neighbourhood of the Geldenhuis Mill. I will be glad to show them to any member who will care to go out. I may add that exactly similar shales and large pebble banket beds, some evidently interbedded in the shales, are to be seen on the dump at the Glynn Shaft of the Apex Mines, again in the same position relatively to the Langerman's Kop Beds, that is if my contention is correct that the so-called Kimberley Beds of the Van Ryn or Far East Rand area are in reality Langerman's Kop Beds. I intend writing a short paper on these banket beds and on this area generally, and I will put in a sketch plan showing the outcrop of these reefs north of the Kensington striped shales. I will then also present some new data bearing on certain marked characteristics of the Hospital Hill quartzites proper north of the valley, and the non-existence of these characteristics in their supposed duplication in the Kensington Ridge south of the valley. I will do this because it seems to me that Dr. Mellor is possibly rather hasty in settling these disputed points in Rand geology, and in assuming finality for his main conclusions when, on his own statement, only a small portion of the evidence has been studied by him. In his reply to Mr. Olver, he states that "Rietfontein lies near the extremity of the district with which he can claim to be intimately acquainted." When he gets beyond Rietfontein to the east I think he will find abundant evidence which clearly shows that Mr. Olver is right, for instance, in confirming my views that the Rietfontein and Van Ryn Reefs belong to the same series. As to their both being Main Reef, that is Mr. Olver's view, but I cannot agree with it. This Far East Rand evidence, I may state, is more difficult to explain away even than the evidence of conformity disclosed in the Rietfontein Mines referred to by Mr. Horwood, and it is evidence with a most important bearing on the position of the Langerman's Kop Beds and Central Rand geology. I wish to say a few words about Dr. Mellor's Coronation shales, merely to repeat that in referring to the shales in the Hamburg section of Dr. Mellor I refer to the whole wide band of shales, and that I do not rely on isolated and selected specimens as he seems determined to insist upon, and I state again clearly that the band of shales as a whole in Dr. Mellor's Hamburg section appears to me to be a totally different band of shales to that with which he correlates it in the Witpoortje section. I will add that my experience of the beds of the Witwatersrand System causes me to require a similarity both in the character and the sequence of the beds before any correlation is justified, and unless this dual similarity is manifest, then I do not think a definite correlation is proved. Dr. Mellor might remember that I disagree with the correlation of the speckled beds, striped shales and green quartzites of Kensington with those of the Hospital Hill, although they are very similar, but the sections do not fulfil to my mind the above requirements of similarity both in sequence and character. I wish to assure Dr. Mellor that while giving great attention to closeness of similarity of the various beds in different localities in these days, I pay just as much attention, probably as much as he does himself, to the complete section and the order and sequence of the various beds, and to their angles of dip and to the direction of strike and dip. In concluding, I would like to recall to mind that at one time I believed, mainly because of the arguments of Mr. Draper, that the Langerman's Kop Beds were to be identified with those of Elsburg, and some of us, including Mr. Draper, looked upon the Buffelsdoorn Beds as Elsburg. No one will deny that they are extremely similar to the Langerman's Kop Beds. Notwithstanding this, some observers, including Mr. Kuntz, maintained that they belonged to the Lower Witwatersrand System, and that they were conformably overlying the Hospital Hill quartzites. In this I have publicly stated that I now agree with Mr. Kuntz in this matter, and that Mr. Draper and I were wrong. In view of this experience I venture to suggest that Dr. Mellor may eventually find himself on dangerous ground in identifying Langerman's Kop Beds with Elsburg Beds brought there by overlap and faulting, and in relying on assumed lines of faulting extending for many miles deduced chiefly on account of varying differences in the dip of the strata. Would it not be advisable to look more to the character and sequence of the beds as a whole? As Mr. Kuntz then advised, I feel certain that, especially in this case of Buffelsdoorn and Langerman's Kop, it would be profitable to examine into the resemblance both in sequence and character of bedding and in the mineralisation (spheroidal carbon, round pyrites, etc.) and the remarkable resemblance in petrological character of the bankets of these Buffelsdoorn Beds to those of Langerman's Kop, Van Ryn, Modderfontein, Nigel and other exposures of the beds of this horizon of the Lower Witwatersrand System. I find that Dr. Mellor has not referred to these matters, although I mentioned them at the last meeting. In regard to the granite on Barretts Rietfontein, I will submit a new view of this in the short paper I propose to read at a later date. The view I refer to is not my own idea, but that of a friend, a geologist who I regret is not a member of our Society. The view is a very interesting one, which to my mind opens up possible explanations of some difficult points.

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*Trans. Geol. Soc., S.A., vol. vii, part ii.

New Heriot.

The returns of the New Heriot Company for last month's operations are as follows: Tons milled, 11,600; ounces recovered, 5,205; profit, £8,371.

Nigel G.M. Co.

The returns from the Nigel mine for April are as follows: 4,703 fine ounces of gold; profit, £4,349; stamps working, 75; value of gold, £19,977; tons milled, 12,750.

Voorspoed Diamonds.

A Reuter telegram states that 13,842 carats of rough and uncut diamonds, value £13,207, were registered at Kroonstad, Orange Free State, during the month of April.

Sheba and Rosetta.

The output from the Sheba Mine for the month of April was 2,971 ozs. of fine gold, being an increase of 158 ozs. over that for March; and the output from the Rosetta for the same month amounted to 245 ozs. fine gold .

Pigg's Peak Development Co.

The report of the Pigg's Peak Development mine for April is as follows:—Running time 27 days 20 hours; crushed 2,722 tons, yielding 872,427 ozs. fine gold; cyanide works treated 2,567 tons, yielding 351,464 ozs. fine gold; total 1,223,891 ozs. fine gold, estimated value, £5,189; working costs £2,120; estimated profit, £3,069. Concentrates in course of treatment of an approximate value of 200 are being carried forward and will be brought to account in the output for May. The additional five stamps just erected will be brought into commission on May 7.

East Rand Proprietary Mines.

The directors of the East Rand Proprietary Mines report that 471,750 tons were milled during the March quarter, the recovery being 177,003 ounces, equal to 7.5 dwt. per ton. The revenue from current gold was £741,518, equal to 31s. 5d. per ton milled, and from accumulated slime treatment £14,918, equal to 8d. per ton milled. Current ore treatment cost £507,861, equal to 21s. 6d. per ton milled, and accumulated slime treatment cost £3,835, equal to 2d. per ton milled, the total working costs being £511,697, equal to 21s. 8d. per ton. Working profit amounted to £244,740, or 10s. 5d. per ton milled. From this profit must be deducted approximately £45,733 to meet the quarterly proportion of the Government profit tax, interest on debentures, etc. The expenditure on authorised votes for the quarter was £44,353, as follows: Reduction plant, £2,356; pumping and air plants, £2,423; new surface haulage, Driefontein to Angelo, and new crusher station, Driefontein, £13,443; native compounds, £6,740; incline shaft-sinking, etc., £16,174; sundry surface and underground equipment, £3,217. The approximate financial position, after providing for all liabilities except the debenture issue of £1,500,000, was £321,598, less cash assets £171,231, which left a balance of £150,367. The number of feet driven, risen, and sunk (excluding shafts) was 11,527; the footage sampled was 8,421; the average reef width was 21.4 inches; and the average assay value on reef width was 13.6 dwt. The actual expenditure on development amounted to £32,896, as against £70,762 provided in the working costs, viz., 3s. per ton milled, leaving a balance of £37,865 18s. 10d. to the credit of the development suspense account, which balance has been included as a liability in the aforegoing cash position. The reason of this credit is that development has not been carried out to the full extent provided for. It is anticipated, however, that as more faces become available the footage driven will gradually increase during the year, with a consequent increase in the rate of expenditure. The 6,000 k.w. set is now in running order, and the remaining plant in the power station is being overhauled. The work of dewatering the Hercules shaft has been commenced, the sinking will be resumed next month. The Angelo Deep section is also being dewatered, with a view to increasing development operations.

May Consolidated.

The salient points of the report of the May Consolidated mine for the March quarter are: Number of tons milled, 37,050; revenue from gold, £53,306; working expenses, £30,138; cost per ton milled, 16s. 6.228d.; working profit for the quarter, £20,167; profit per ton milled, 10s. 10.639d.; sundry revenue, £810; balance profit for the quarter, £20,977.

Benoni Consolidated.

The report of the Benoni Consolidated Gold Mines for the March quarter puts the golds revenue at £52,172, or 18s. 8.454d. per ton milled. The total working costs were £55,057, or 19s. 8.863d. per ton, and the net working loss was £2,884, or 1s. 0.409d. per ton. East Shaft: Stoping operations have been carried out on the Main Reef and Upper Main Reef, and 45,841 tons from this section have been sent to the crusher station. Central Shaft: 18,206 tons of Main Reef have been sent to the crusher station from this section. The footage driven, risen and sunk on the reef was 481 feet, the payable sections of which were as follow:—(a) Main Reef: Footage, 113 feet; average stope width, 44.70 inches; average stope value, 9.22 dwt. (b) Upper Main Reef: Footage, 45 feet; average stope width, 42 inches; average stope value, 6.72 dwt. Ore milled amounted to 55,785 tons. Capital expenditure was £2,710. The ore reserves on a milling basis at the end of the quarter were as follows:—Payable: Tons, 537,475, milling width 44.74 inches, assay value 6.43 dwt.; unpayable: Tons, 360,738, milling width 46.10 inches, assay value 3.31 dwt. Totals and averages, 898,213 tons, milling width 45.28 inches, assay value 5.18 dwt. Treatment of the slimes was carried on during January and to February 14. From the latter date to the end of the quarter the slimes treatment was suspended and treatmentment of the sands only (collected on the Caldecott table) was carried on. In the case of the slimes it was found that the cost of treatment was prohibitive because of the large quantity of moisture underflowing from the first three cones, and being pumped with the slimes into the plant, with consequent loss of gold-bearing cyanide solution at the other end, and because of the insufficient capacity of the clarifiers to deal with the increased bulk of solution.

Apex Mines.

The Directors of the Apex Mines report as follows for the quarter ended March 31:—Gold Section—North shaft, main incline: This shaft was sunk 174 feet, making a total depth of 2,369 feet. In accordance with the policy of the Board, as indicated in the last quarterly report, that the available cash resources of the company should be concentrated on increasing the ore reserve by opening up the mine down to the 5th level, sinking in this shaft was temporarily suspended at the end of January, 1912. Development: The footage driven, risen and sunk (excluding shaft-sinking), was 3,813, made up as follows:—Driving on Main Reef, 2,274 feet; cross-cutting, 683; rising 241; sinking, 251; boxhole rises (to fully expose reef), 282; varions, 82; total, 3,813 feet; 2,025 feet were sampled on Main Reef, with the following results:—Payable: sampled 1,470 feet, reef width 40.28, reef value 8.56 dwt; unpayablo, sampled, 555 feet, reef width 24.74 inches, reef value 3.48 dwt. Ore reserves: The ore reserves on a milling basis as at March 31 were estimated to be as follows:—Payable, milling, 386,751 tons, milling width 52.91 ins., milling value 6.43 dwt.; unpayable, milling 79,189 tons, milling width 46.75 ins., milling value 2.89. It will be noticed that although a certain amount of development footage was in unpayable areas, there was no increase in the unpayable ore reserves completely blocked out. South Shaft: No work has been done at this shaft during the quarter. The net expenditure during the quarter on this section of your company's property on capital account was £40,232 17s. 8d. The tonnage of coal disposed of was 53,453, the profit being estimated at £9,100. No capital expenditure has been incurred for the quarter on this section. The following statement, which was published locally and in London on April 26, 1912, is repeated for the information of shareholders:—"The board have under consideration proposals for the acquisition of the assets and liabilities of the Benoni Consolidated Gold Mines, Ltd., and the provision of adequate working capital. Under these proposals it is suggested to increase the reduction plant of the Benoni Company up to a capacity of 40,000 tons per month, on which basis the combined company should be able to mill in about a year's time. The boards of both companies have secured the services of Mr. C. D. Leslie, consulting engineer to the Consolidated Gold Fields of South Africa, Ltd., who will make an independent report and valuation, which will be submitted to shareholders. The report will state, *inter alia*, whether the terms proposed are fair and equitable to both companies."

Rhodesian Section.

A MINING CODE FOR NORTHERN RHODESIA.

Compensation for Mine Natives—Latest from the Shamva, the Bell and the Colleen Bawn Districts—Berwick Looking Well—Rhodesia Mines Trust.

The Northern Rhodesian *Government Gazette* of the 25th ulto. contains a Proclamation relating to Mines and Mining. The Proclamation recognises the vested right of the British South Africa Company of searching for and disposing of all mineral oils in Northern Rhodesia notwithstanding the dominion or right which any other party or parties may possess in the soil, on or under which such mineral products are found. The Proclamation is due to take effect on July 1st next, and has been looked forward to with considerable interest both in Northern and in Southern Rhodesia as holding out some promise of a new field of activity. The pegger may peg off and register a mining location of such form and area as may be authorised by the licence. The location may be worked for profit, "with the sanction of the British South Africa Company." The terms on which such working for profit may be carried on are left for arrangement with the Company. There are other striking points in the Proclamation; mention of Inspection Certificates and Certificates of Extra Work is made only in Section 17, where it is laid down that these must bear a ten shilling stamp. No conditions of any sort appear under the Proclamation to attach to the tenure and protection of claims, apart from registration and keeping them will beaconed. It may be presumed that such terms as the British South Africa Company thinks fit to insist upon in regard to the protection of claims, by work or payment, will be endorsed on each particular licence.

* * * *

The earthworks of the branch railway which is being laid to the Shamva are practically completed, a distance of less than five miles of the route remaining to be done. Further than this, the foundations of the Mazoe bridge are well in hand, while those for the Poorti bridge have been commenced. As such excellent progress is being made with this work, it is regrettable to learn that owing to the recent coal strike at Home, the delivery of the rails has been delayed by some three or four months.

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Reports from the Colleen Bawn district speak enthusiastically of the results which are being obtained from the milling of Berwick ore. The Berwick which is being developed by Rhodesia, Limited, is a small high-grade proposition, and it is the intention of the company to continue crushing at the Colleen Bawn mill for the next two months, as a trial, preparatory to installing a reduction plant on the mine itself. Milling proceeded during April for ten days. and estimates of the recovery are variously given at between 600 and 800 ounces.

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The new headgear at the Bell Mine has now been completed, and the winding engine is said to be working smoothly. This much is borne out by the fact that rapid progress is being made with the sinking of the new vertical main shaft, which, to date, is down to a depth of close on 150 ft. The reef is expected to be cut at 900 ft., but the shaft will be connected with the main workings at the 6th level. The management are now calling for tenders for the erection of quarters for the staff and workmen, while it is expected that a reduction plant will shortly be ordered. Meanwhile, tests with the ore are being conducted by the Rhodesian Refractory Minerals Process, Ltd., at Gadzema.

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The current number of the Rhodesian *Government Gazette* contains the text of a draft Ordinance to provide for the payment of compensation to natives employed on mines who suffer injury or death in the course of their employment. This Ordinance is to be known as the "Native Labourers (Mines) Ordinance, 1912." The draft Ordinance, which will be considered at the forthcoming session of the Legislative Council, says, *inter alia*:—"Every person carrying on mining operations in this territory shall pay to any native labourer employed by him compensation in respect of any personal injury caused by accident arising out of or in the course of his employment whereby such labourer has become permanently totally or partially incapacitated, and, should such labourer have met his death by any such accident, shall pay compensation to any person dependent upon him, as hereinafter provided.

* * * *

The report of the Rhodesia Mines Trust, Ltd., states, *inter alia*:—*Claim Holding*.—During the period under review the Mangwe and Cachara properties—amounting to ninety claims—in the Mazoe district have been sold to the Asp Gold Mining Company, Ltd., for 33,000 fully-paid £1 shares in that company. The total number of claims now owned by the company is 350, also a one-third interest in a further sixty claims, known as the Ruby, in the Victoria district. *Development*.—During the year very considerable work was carried out on the properties on option, referred to in the last report, and on the results in such cases as have proved unsatisfactory the options have been allowed to lapse. *Elgin*.—These claims in the Umtali district are let on tribute, the company's percentage in royalty during the year amounting to £439. Terms have also been arranged for leasing some twenty claims in the Hartley district. *Shamva East, Ltd*.—At the general meeting of this company on the 20th February, 1912, it was stated that work had been delayed owing to the non-delivery at the mine of the necessary steam plant, but this has since been erected, and the shaft is being sunk to the 250 ft. level; at the 150 ft. level the ore-body has been proved for over 90 ft. in width, with values varying from traces to 13 dwts. gold per ton. In the resumption of sinking the main shaft from 150 to 158 ft., good values have been encountered, up to 17 dwts. gold per ton, whilst the most recent information is that the average for the 15 feet sunk from 150 to 165 ft. is now 2·9 dwts., the bottom of the shaft assaying 4·8 dwts. gold per ton. Your company holds over three-quarters interest in the Shamva East, Ltd. (whose property immediately adjoins that of Shamva Mines, Ltd.), and if the recent rate of improvement is maintained in depth the value of this interest must greatly exceed its book value. *The Asp Gold Mining Company, Ltd*.—Your company holds an interest of over 20 per cent. in this company, which owns the Asp, Prince of Wales, Cachara, Mangwe, and other properties, consisting of 257 claims adjoining the Kimberley and Hay Mines, and situated about 35 miles north-east of the township of Mazoe. The Asp reef is shown at surface by old workings extending for some 7,000ft. in length, and work is proceeding vigorously thereon in three sections, covering approximately 4,000 ft. along the line of reef. On the western section the 1st level is opened for 800 ft., and averages 9 dwts. gold over a width of 50 inches. The new shaft is down 150 ft., and at the point of intersection shows two parallel ore-bodies, the first assaying 7½ dwts. over a width of 9 feet, and the second assaying 13·5 dwts. across a width of 6 feet; the winzes below the 1st level are also being sunk with good results; No. 1 west for the whole depth averaging 8·9 dwts. over 51 inches. On the eastern section, two shafts sunk to the 83 ft. level show 11·4 dwts. over 59 inches width, and 8·4 dwts. across 76 inches respectively. At the "Potholes" or extreme western section two shafts are down to and connected by a drive at the 1st level, the average over 100 ft. of driving being 16 dwts. over a width of 15 inches, and good results are also maintained in the further sinking. *Ruby.*—This property, which is equipped with a five-stamp mill, has been worked on a silicious schist underlying banded ironstone, and has been stoped out from the surface to an average depth of about 50 feet for a length of some 240 feet; the places accessible assay from 7 to 8dwts. across widths of from 3 to 5 feet. A shaft has been started to intersect the reef at a depth of 120 ft.

THE GLOBE AND PHOENIX: CONSULTING ENGINEER'S REPORT.

Questions of Profits and Ore Reserves.

The following is from the report of the consulting engineer to the Globe & Phœnix (Mr. H. A. Piper) on operations at the mine to the end of last year. The report is dated Que Que, 12 February, 1912:—"Gentlemen,—In submitting my annual report for the year 1911, I would draw your attention to the fact that the scarcity of native labour has made itself felt during the period to an extent unknown previously. Owing to this, the average monthly tonnage crushed has been considerably less than the mill and equipment generally could deal with. This has had the effect of increasing working costs and considerably reducing the total profit made for the year. Under these circumstances, it is certainly satisfactory to be able to report an increase in the mine profit of over £80,000 as compared with the previous year. It is also satisfactory to report an increase in the grade of the ore reserves, which more than makes up for a slight decrease in the tonnage. A disquieting feature, however, is the appearance of disturbed ground at the two bottom levels. To what extent this will affect the future of the mine at depth cannot yet be estimated.

Footage for the year amounted to a total of 5,063 feet, as follows:—Permanent work, 721 feet; dead work, nil; development, 4,342 feet; total, 5,063 feet. The total footage to date on the Phœnix Mine is 52,578, or almost exactly ten miles.

Main Shaft.—During the year there has been no trouble with the main shaft. However, owing to the increased depth at which all the development and most of the stoping is being done the shaft has been worked at its full capacity when hauling the rock necessary for a full month's run. Sinking has been continued down to the 19th level (depth 2,672 feet on incline), and the 19th level bin is now in course of construction. It is not intended at present to take this shaft any further. *Ore Reserves.*—Main Reef, 4,984 tons; Parallel Reef, 215,400 tons; broken ore, 2,581 tons; total, 222,968 tons; unpayable, 49,355 tons; total, 173,613 tons. The average assay value of this 173,613 tons is 37·0 dwts., and the average width of reef is 38·5 in. This represents 320,999 ounces of fine gold, or an increase over a year ago of 18,868 ozs. fine. Of this tonnage the exceptionally high grade blocks show as follows:—At December 31st, 1910, 27,893 tons at 118·0 dwts., 53·5 in. 164,624 ozs.; at December 31st, 1911, 31,870 tons at 115·6 dwts., 46·7 in. 184,265 ozs.; or an increase of 3,977 tons containing 19,641 ozs. The amount of high grade ore taken from reserves during 1911 was 7,703 tons, averaging 117·1 dwts. per ton.

Profit for Year.—The mine profit for the year mounted to £367,411, details being as follows:—Profit on milling, £321,904 11s. 8d.; cyaniding, £202 19s. 8d.; slimes, £8,467 14s. 8d.; concentrates, £38,706 12s. 7d.; sundries, £3,229 8s. 2d.; total, £372,511 6s. 9d. *Less*—Fire insurance, mine, timbering and ventilation, £983 15s. 11d.; native labour supply and tax, £3,216 14s. 4d.; prospecting, £899 6s. 4d.; total, £5,099 16s. 4d. *New Plant.*—A condensing plant and cooling tower have been erected during the period, and were completed early in December. It is still too soon to estimate the exact saving involved, but it appears that this will be considerable. *River Pump.*—This has now been electrified, thus doing away with the boiler plant at the river. This also should prove a considerable saving. *Sands Plant.*—This is in course of construction, foundations being well forward. The plant consists of three Edward's Duplex Roasting Furnaces, twelve Grinding Pans, two 22ft. by 5ft. 6in. Tube Mills, and eight Agitating Tanks. The capacity of this plant will be 300 tons per day. This will enable us to treat 100 tons of current sands and 200 tons of accumulated sands per day. The latter now amounts to about 150,000 tons. *Conclusion.*—No definite information with regard to the development of the mine at depth can be given for several months. The recent encouraging points are: A winze from 17th to 18th levels in the reef discovered north beyond the broken section is going down on a well defined narrow reef, and giving fair values; and the drive south on the east reef at 18th level is in exceptionally high grade ore, the reef being strong and well defined."

Rhodesia Chamber of Mines.

In the course of their report for March, the Executive Committee of the Rhodesia Chamber of Mines states:—

The following is a summary of the returns of native labourers employed on Southern Rhodesian mines at the end of the month of January, 1912. These returns were received very late, and those for February have not yet been received. The figures for December, 1911, are given for comparison: January, 1912, Local, 11,101; December, 1911, 11,219; January, Portuguese Territory, 7,008; December, 6,752; January, N.W. Rhodesia, 1,266, December, 1,292; N.E. Rhodesia, January, 5,167, December 5,315; Nyasaland, January, 4,366, December, 4,300; other sources, January, 900, December, 829. Totals—January, 1912, 33,108; December, 1911, 32,737. The decrease in January as compared with the corresponding month of 1911 was 2,330 natives. The distribution was as follows: January, 1912, producing gold mines, 19,613, December, 1911, 20,312; January, 1912, non-producing gold mines, 12,282, December, 1911 11,311; January, 1912, coal and other mines, 1,213, December, 1911, 1,111. Totals: January, 1912, 33,108, December, 1911, 32,737. Phthisis—A communication has been received from the Medical Director notifying that all "voluntary" natives suffering from phthisis will be treated, free of charge to mines, in Government Hospitals. Kaffir Beer Ordinance.—Representations have been made to the Government in regard to the restrictions placed upon the brewing and sale of kafir beer in mine compounds by the Kafir Beer Ordinance, which was promulgated during the month. It has been pointed out that the Ordinance appears to have been passed under a misapprehension as to the requirements of the mining industry. The Committee have requested the Government to suspend the operation of the Ordinance pending its amendment. De Beers' Diamond Concession.—In view of the decision of the Privy Council that the De Beers Consolidated Mines, Limited, are entitled to have issued to them an exclusive licence to work all diamondiferous lands in Southern Rhodesia, that company has been approached with the object of ascertaining if terms can be negotiated for the opening up of the territory to diamond mining. It has been pointed out that pending the outcome of the litigation, prospectors, who know of promising areas, have been unable to obtain reasonable facilities for the working of diamonds, the terms laid down by the "Precious Stones Mining and Trade Ordinance, 1906," being valueless. The Committee have expressed the hope that, by arrangement with the De Beers Consolidated Mines, Limited, more attractive terms may be granted and legalised. Amongst other matters which engaged the attention of the Committee during the month were:—Native Affairs Report, Labour Tax Ordinance, Bulawayo Telephone Service, Status of Mine Surveyors, etc.

The branch line to the Cam and Motor Mine has been completed.

A rumour is current to the effect that the Cactus Mine in the Hartley district has changed hands. The purchase price is said to be £20,000.

WHAT THE RHODESIAN MINES BUY.

Steady Growth in Importation of Mining Material and Stores for Mining Purposes in 1909, 1910, and 1911.

The following list shows the value of the imports of the principal mining materials and stores into Southern Rhodesia during the years 1909, 1910, and 1911. The particulars are taken from the official statements:—

	1909.	1910.	1911.
Assay Apparatus	£3,638	£7,216	£9,552
Dynamite, etc.	53,453	79,193	73,310
Candles	22,895	27,574	28,521
Cement	6,143	7,384	10,364
Coal	47	...	...
Coke and Patent Fuel ...	882	1,331	1,265
Native Foods	34,294	19,459	12,541
Cyanide of Potassium ...	14,056	10,035	8,364
Cyanide of Sodium ...	19,325	20,905	23,473
Detonators and Fuse ...	13,738	18,995	16,125
Electric Fittings	6,971	11,661	15,295
Grease, Antifriction ...	2,401	2,780	3,704
Iron and Steel	55,970	89,023	96,386
Lead	477	469	19,641
Lime	2,357	2,585	3,392
Machine Oil	10,212	11,185	12,855
Machinery—Electrical ...	7,231	11,822	5,982
Machinery—Mining ...	134,575	182,502	185,670
Quicksilver	3,232	2,659	3,351
Ropes, Wire	3,416	7,281	6,286
Salt, Common	2,454	2,613	2,864
Wood	20,188	30,917	51,808
	£417,985	£547,589	£590,749

The Phthisis Bill.

CORNISH ASSOCIATION'S RESOLUTIONS.

The following resolutions, passed by the Cornish Association of the Transvaal, have been forwarded to the Chairman of the Select Committee on the Miners' Phthisis Bill. Resolution No. 1.—That the Cornish Association of the Transvaal is opposed to the contributory principle as laid down in the Bill. (a) Because we consider that in the report of the Miners' Phthisis Commission (p. 25, sec. 75) miners' phthisis is acknowledged to be an occupational disease. (b) Because on page 18, latter part of section 44 of the Commission's report, it is shown that, "the habits of the miners in this respect are not a critical factor in the prevalence of the disease." (c) Because if the principle of contribution were allowed to stand, the amounts it is proposed to levy are altogether out of proportion to the actual amounts earned by miners, as indicated in the White Employes Salaries and Wages Report of December, 1911. Resolution No. 2.—This association objects to the exclusion of contractors from benefits of the Bill according to the definition of "miner" give in clause 1 (interpretation of terms), and recommends the deletion of all words in this definition after the words "work done" (page 2, line 19), of the Bill. (a) Our reasons are: That all persons employed below the surface of the mine are liable to contract "miners' phthisis." (b) That because of the non-continuity of employment on the Witwatersrand mines the status of the underground worker is subject to constant change, and it would be manifestly unfair to exclude any class of employe from the benefits accruing under the Act. Resolution No. 3.—That all metalliferous mines on the Witwatersrand area be included in the operation of the Bill. Resolution No. 4.—That benefits be extended to miners who have worked one year instead of two years as required in the Bill, clause 12. Resolution No. 5.—In regard to clause 11 of the Bill: That we consider the amounts it is proposed to award as compensation are not sufficiently large; because: (a) £8 per month is not sufficient to maintain a family on the Witwatersrand owing to the high cost of living. (b) That in comparison with the amounts which it is proposed to force miners to contribute to the fund, the compensation suggested may often amount to less than the miner will actually pay in. Also that in all cases where it is proposed to pay £8 per month the amount be raised to £12 per month, and that the widow of a miner dying from miners' phthisis be paid the sum of £6 per month. And that it is desirable that some provision be made for persons, such as aged parents or other relatives who might be proved to the satisfaction of the Board to have been dependent on a person who dies from miners' phthisis.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

INVESTORS' DIARY.

The following company meetings have been announced:—

May 17.—Wit. Deep; Knight Central; Wolhuter; Treasury; Consolidated Main Reef; Main Reef West; Witbank Colliery; Vogelstruis Consolidated Deep (Extraordinary General Meetings).
May 18.—Aurora West.
May 22.—Apex Mines; New Kleinfontein.
May 23.—Benoni Consolidated; Crown Mines; National Bank (at Pretoria); Rose Deep.
May 28.—Geldenhuis Deep; Durban Roodepoort Deep
May 29.—Robinson G.M. Co.; New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn; Bantjes Consolidated Mines.
May 30.—Village Deep; City Deep.
June 4.—Ferreira G.M.; Modder B.
June 5.—Rand Mines.
June 7.—General Mining and Finance Corporation.
June 21.—New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.
June 26.—Transvaal Consolidated Lands.
June 28.—A Goerz & Co.
July 19.—Transvaal Consolidated Lands.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal--Views, Suggestions and Experiences of Readers.

Moore-Butters Litigation.

To the Editor, *South African Mining Journal.*

Sir,—" With reference to the letter by Charles Butters & Co., Ltd., appearing in your issue, we are instructed by the Moore Filter Co. to say:—(1) That the decision of the United States District Court makes no reference whatever to any Butters patent, but only to the Cassel patents. (2) That the finding of the Court is that the stationary type of filters does not infringe the Moore patent, which is a movable type. And we are to add that the Moore Filter Co. exclusively control the Cassel patents, which are the basic patents on all the stationary types of filters."

HUDSON & FRAMES,
Solicitors.

World's Deepest Boreholes.

To the Editor, *South African Mining Journal.*

Sir,—In your last issue dated May 4th, under the above heading, you reproduce and emphasise a statement made by Mr. J. I. Hoffman, in a paper read before the Institute of Mining and Metallurgy at London on April 18th, to the effect that the boreholes put down by the Lace Proprietary Mines on Vlakfontein No. 26, and on Witpoort No. 162, by the South African Lands and Exploration Co., Ltd., constitute a world's record. You state that the Vlakfontein borehole reached 6,656 feet, measured along the rods, and was the deepest borehole in the world. According to Mr. Hoffman's paper at the bottom of the borehole the deflection from the vertical was 58°, so that at a depth of 6,656 feet, which you state was the lowest depth, reached, if due allowance be made for deflection, the vertical depth was only 5,203 feet from the surface. If, however, we take the depth as measured by the boring rods, 6,656 feet, which is 1,453 feet longer than the actual vertical depth, it is even then far from being the deepest borehole in the world. If we take the actual vertical depth it is then exceeded, as a matter of fact by at least a dozen other boreholes. Probably the honour of having the deepest boreholes in the world belongs to Germany, where in Silesia the Czuchow borehole attained a vertical depth of 7,348 feet from the surface, whilst there are several other boreholes in Germany and elsewhere exceeding the depth even attained on the incline at Vlakfontein. Actual mining operations both in North and South America have exceeded the vertical depth reached at Vlakfontein, and it will be seen that the claim made for this borehole to be regarded as the deepest in the world is out of date, and must have been advanced under a misapprehension.

Yours, etc.,
ROWLAND GASCOYNE.

MINING MEN AND MATTERS.

The annual dinner of the Chemical, Metallurgical and Mining Society will be held this evening.

* * * *

Mr. A. R. Sawyer has returned to the Rand from the O.F.S., and reports that satisfactory progress is being made at the New Rand property.

* * * *

Mr. J. H. Curle has written a book about his travels. The *Cape Times* criticises it as containing too much Curle and too little about the countries visited.

* * * *

Mr. U. P. Swinburne, Inspector of Mines, Bloemfontein, has been appointed Chairman of the Dutoitspan and Bultfontein Mining Boards, vice Mr. T. Quentrall, retired.

* * * *

Mr. C. D. Leslie, of the Consolidated Goldfields, was entertained this week by the staff of the Consolidated Goldfields prior to his departure to-day for Europe on a well-deserved holiday.

* * * *

Mr. James Cook, M.I.M.M., manager of the Eldorado Banket Gold Mining Company, is resigning his present position to take up an important appointment in North-Western Rhodesia.

* * * *

By the death of Mr. John Henry Scrutton, which occurred on Wednesday night, Johannesburg loses another pioneer. Mr. Scrutton, who was up to a few years ago well known in mining and legal circles, was the son of the late Mr. Frederick von Blucher Scrutton. He was born at Swellendam, and educated at the South African College. He came to the Rand in 1889, and was well known in Johannesburg legal circles for many years. He then transferred his attention to his mining interests, and settled on a property in the Pietersburg district some 12 months ago. Mr. Scrutton, who returned to the Rand a few weeks ago, had been in indifferent health for some little time.

* * * *

A meeting of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, on Monday evening, May 13, at 8.15 p.m. The following papers will be open for discussion:—" The Normal Section of the Lower Witwatersrand System on the Central Rand, and its connection with West Rand Sections," by E. T. Mellor, D.Sc.; " The Palabora Plutonic Complex of the Low Country and its relationship to the Pegmatites of the Leydsdorp Mica Fields," by Mr. A. L. Hall, B.A.; " The Crystalline Metamorphic Limestone of Lulukop and its relationship to the Palabora Plutonic Complex," by Mr. A. L. Hall, B.A.; " On an interesting Dyke Intrusion in the Upper Waterberg System," by Mr. P. A. Wagner, D.Eng., B.Sc., M.E.; " The Nama System in the Cape Province," by Mr. A. W. Rogers, D.Sc. The following paper will be read: " Topography and Geology of the German South-west Kalahari," by Dr. Paul Range.

The registered offices of the Belingwe Gold Reefs, Ltd., have been removed to Throgmorton House, 15, Copthall Avenue, E.C.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings, Box 2061, Johannesburg.

THE APRIL OUTPUT: GROUP RETURNS.

Profits Affected by Short Month.

Rand Mines Group.

The following are the results of crushing operations of the subsidiary companies of the Rand Mines, Ltd., group for April:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	62,500	18/ 2	21,398	£33,020
Geldenhuis Deep.	300	7	55,400	24/ 3	20,280	17,558
Nourse Mines ...	260	7	51,400	22/ 6	19,740	24,665
Ferreira Deep ...	160	4	32,310	22/10	18,468	40,552
Crown Mines ...	660	26	149,500	19/ 2	58,244	100,448
Durban Rood. D.	100	3	24,300	23/11	8,869	8,048
Totals & average	1780	54	375,410	20/10	146,999	£224,289

The declared estimated monthly profits for 1912 are:—January, £206,122; February, £209,989; March, £267,731*; April, £224,289.

*Including £50,129 special declaration of reserve gold.

Nourse Mines.—The recovery per ton was abnormally high for the month of April. It is not expected that it will be maintained at that rate.

Crown Mines.—The working costs are unduly high owing to the great fluctuation which has taken place in the labour force and the consequent lowering of the general efficiency of new arrivals.

The following are the results of crushing operations of the Eckstein companies of the Rand Mines, Ltd., for April:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	30,900	18/ 2	14,298	£31,853
New Modder... ...	180	7	43,620	21/ 5	20,591	39,148
City Deep	110	9	39,000	23/ 4	16,291	22,417
Village Deep ...	180	6	49,200	19/ 1	16,688	22,966
Village Main ...	220	6	37,950	18/10	16,555	33,201
Ferreira	80	3	18,200	18/10	6,383	9,048
Robinson...	250	6	44,600	16/ 3	23,039	60,478
Bantjes	70	3	22,660	24/ 5	8,109	6,173
Totals & average	1170	45	286,130	19/10	121,954	£225,284

Village Deep.—The reduced profit is due to lower tonnage crushed and an instruction to the management to keep the grade to approximately the average value of the ore reserves.

Robinson.—The reduced tonnage due to interference to hoisting arrangements of small accidents to winding plant.

Neumann Group.

The following are particulars of the results achieved by the crushing companies in this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Wit. Deep	36,630	£51,933	£16,519
Wolhuter	29,000	40,500	15,082
Main Reef West	15,498	26,206	8,779
Knight Central	23,960	29,499	6,047
Consolidated Main Reef ...	21,967	30,673	8,644
Treasury-cum-Jumpers ...	—	—	262
		Total for group	£55,333

Reserve Gold.—Wolhuter, 2,618·227 ozs.; Consolidated Main Reef, 114·039 ozs.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of April of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ...	320	7	74,100	19,507	£41,576
Robinson Deep	210	5	49,900	19,179	37,502
Knights Deep	270	6	59,720	12,321	17,599
Simmer East	130	3	31,760	6,920	5,551
Simmer Deep	120	9	44,100	9,552	1,676
Jupiter	110	6	39,450	9,566	6,157
Luipaardsvlei	60	3	16,400	3,493	1,607
Sub Nigel	30	1	4,224	2,000	1,358
Totals	1250	40	319,654	82,338	£113,026

Reserve Gold.—Simmer and Jack, 1,455 ozs.; Robinson Deep, 4,362 ozs.; Jupiter, 550 ozs.; Sub Nigel, 400 ozs.; total, 6,767 ozs.

The "total profit" shown above includes sundry revenue, viz.: Simmer and Jack, £1,500; Robinson Deep, £196; Knights Deep, £219; Simmer East, £98; Simmer Deep, £520; Jupiter, £286; Luipaardsvlei, £960; Sub Nigel, £335; total, £4,114.

The Albu Group.

The April operations of the producing mines of the Albu group are as follows:—

Company.	Stamps.	Tube Mills.	Tons Crushed.	Total Cost.
Aurora West	70	—	12,726	£13,017
Cinderella Consolidated ...	80	3	18,010	21,718
Meyer and Charlton	75	2	13,800	12,114
New Goch	120	4	24,792	22,852
Roodepoort United	50	3	26,875	25,585
Van Ryn	125	6	38,650	28,800
West Rand Consolidated ...	100	4	27,500	31,128
	620	22	162,353	£155,214

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	20/ 5·5	£14,717	£1,700
Cinderella Consolidated ...	24/ 1·4	27,725	6,007
Meyer and Charlton	17/ 6·7	29,602	17,488
New Goch	18/ 5·2	25,803	2,951
Roodepoort United	19/ 0·5	30,232	4,647
Van Ryn	14/10·8	51,313	22,513
West Rand Consolidated ...	22/ 7·6	36,315	5,188
		£215,707	£60,494

The monthly gross profits for 1912 are:—January, £62,769; February, £48,400; March, £61,777; April, £60,494.

Aurora West United.—The renovation work in connection with the mill was completed last month, and the full 80 stamps are now running. The preparations for the augmented scale of crushing affected to some extent working expenditure and profit for April.

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of April are:—

COMPANY.	STAMPS.	TUBES.	TONS.	VALUE.	PROFIT.
May Consolidated ...	100	—	12,000	£16,208	£6,137
Princess Estate ...	50	5	17,800	21,748	—
Lancaster West ...	100	3	17,350	20,217	—
Geduld	50	2	14,050	18,444	4,512
	300	10	61,200	£76,617	£10,649

Princess Estate.—Net loss £461.

Lancaster West.—Net loss £1,437. Loss solely due to breakdown of mill engine, which reduced the crushing period to 25 days. Repairs were completed before end of April, and expenses in connection therewith have been charged out. Results for May will be unaffected by breakdown.

Barnato Group.

The following are the results of operations for April on the producing mines of the Barnato group:—

COMPANY.	STAMPS.	TONS.	REVENUE.	PROFIT.
Consolidated Langlaagte .	140	20,050	£29,073	£8,640
Ginsberg	80	13,537	20,561	6,404
Glencairn	160	18,558	15,643	2,807
New Primrose	160	23,800	33,655	17,011
New Rietfontein	120	15,275	20,158	4,083
New Unified	60	10,300	16,625	5,077
Quest	30	2,569	3,040	733
Witwatersrand	220	38,520	45,334	18,581
April totals	970	142,609	£184,089	£63,336
March totals	970	146,507	£189,243	£61,223

The monthly gross profits for 1912 are:—January, £59,227; February, £58,273; March, £61,223; April, £63,336.

Diespecker G.M. Co.

In terms of Section 62 (1) of the Transvaal Companies Act, No. 31 of 1909, a meeting of creditors of the company will be held on Wednesday, 22nd May, 1912, at the office of Mr. Fred Lance, liquidator, at Pretoria.

Ceylon Lydenburg Output.

The output from the Ceylon Lydenburg mine for April was as follows: Tons crushed, 480, yielding 365 ozs. fine gold, valued at £1,533; total value of month's output, £1,533; estimated profit for month, £819.

New Eland Diamonds.

The washing returns for April of the New Eland Diamond Company were:—Number of loads, 6,378; diamonds found, 1,138 carats; percentage, 17.84.

West Rand Consolidated.

The Directors' Report for the quarter ending March 31st, states: Number of feet driven, sunk, and risen, 3,619.5 feet; ore mined, 92,665 tons; less waste ore discarded, 7,965 tons; ore sent to mill, 84,700 tons; total yield, 23,655.014 ozs. (5.592 dwts. per ton). Revenue: £100,724 (23s. 9d. per ton); working expenditure, £90,267 (21s. 4d. per ton); working profit, £10,456 (2s. 5d. per ton); capital expenditure, £6,329. The working profit shows a decrease on that for the previous quarter of £6,047 0s. 7d. This is due to an increase of 2s. 1d. per ton in working costs, in consequence of the introduction of a more drastic basis of allocating underground expenditure between mine development and working costs respectively, as the result of which working costs are now bearing charges hitherto debited to mine development. This is to some extent reflected in a footnote to the expenditure and revenue statement to the effect that during the past quarter £2,684 0s. 7d. has been charged to working costs for mine development redemption in excess of the actual expenditure on mine development.

Cinderella Consolidated.

The Directors' Report for the quarter ending March 31st, states: Number of feet driven, sunk and risen, 3,027 feet; ore mined, 55,167 tons; less waste ore discarded, 7,927 tons: ore sent to mill, 47,240 tons; total yield, 15,776.192 ozs. (6.679 dwts. per ton). Revenue: £67,422 (28s. 6d. per ton); working expenditure, £59,364 (25s. 1d. per ton); working profit, £8,057 (3s. 4d. per ton); capital expenditure, £32,383. The working profit, which shows a decrease of £121 9s. 7d., as compared with the previous quarter, would have been sensibly higher but for the shortage of native labour experienced during most of the period, but which has since been made good. 295 feet were sunk in the central shaft, making a total depth of 1,877 feet. Sinking was temporarily stopped on March 15 to instal permanent pumps, the water having increased to 200,000 gallons per 24 hours. The foundations were completed for the erection of the No. 2 electric winder at the Cinderella shaft.

Vaal River Diamonds.

Some 1,459¾ carats of diamonds were registered by diggers on the New Vaal River Estate in April. These diamonds realised £7,154 7s. 6d.

Simmer and Jack.

The Directors' report for the quarter ended 31st March, 1912, states:—Mine.—Number of feet driven, sunk and risen, 476½ feet; ore crushed, 204,400 tons; less developed, estimated at about 96,303 tons (the quarterly estimate of tonnage should not be expected to include all ore fully and partially developed during the period, as blocks of ground may be held over pending fuller information); excess crushed; during period, 108,097 tons. Mill: During January an average of 320 stamps ran 29 days 14 hours 40 mins.; during February an average of 320 stamps ran 28 days 12 hours 24 mins.; during March an average of 320 stamps ran 30 days 9 hours 22 mins. Total running time, 88 days 12 hours 26 mins. Mill and tube mills—Tons crushed, 204,400 tons; tons crushed per stamp per 24 hours, average 7.216 tons; yield in fine gold, 29,959.665 ozs.; yield per ton crushed in fine gold, 2.931 dwts. Sands works—Sands treated (equal to 52.15 per cent. of tonnage milled); 106,600 tons; yield in fine gold, 16,864.906 ozs.; yield per ton treated in fine gold, 3.164 dwts; yield per ton crushed in fine gold, 1.650 dwts. Slimes works—Slimes treated (equal to 47.85 per cent. of tonnage milled), 97,800 tons; yield in fine gold, 10,749.469 ozs.; yield per ton treated in fine gold, 2.198 dwts.; yield per ton crushed in fine gold, 1.052 dwts. Total yield—Total yield in fine gold for all sources, 57,574.040 ozs.; total yield in fine gold per ton crushed, 5.633 dwts. Included in yield from slimes are 979.334 ozs. of fine gold, from 9,839 tons of accumulations treated. Estimated appropriation for additions and renewals fund, £5,625; amount appropriated for shaft sinking, £21 9s. 1d.; profits tax (estimated), £11,000; balance, estimated nett profit, £107,785 2s. 10d.—£124,431 11s. 11d. The amount spent during the quarter, chargeable to additions and renewals fund, was: On additions, £152 11s. 11d.; on renewals, £354 6s. 9d.—£506 18s. 8d. At 31st March, 1912, there was gold in reserve of 1,855 ozs.

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THE WEEK IN THE SHAREMARKET.

Easier with Few Changes—Randfonteins Lower—Brakpans Better.

THE week has been uneventful in the market. Randfonteins continue to sag, and Far East counters, such as Brakpans and Coal Trusts, to improve. Otherwise, Rand stocks remain quiet. Rooibergs have improved, but Zaaiplaats after having shown a notable recovery, are again quiet. Bushveld Tins have made a re-appearance. There has been some demand for diamond syndicates, but not enough to arouse any enthusiasm. The paucity of features is reflected in the following list:—

	Friday, 3rd.	Sat., 4th.	Monday, 6th.	Tuesday, 7th.	Wed., 8th.	Thurs. 9th.
African Farms	18 3	17 10	17 6	17 0B	17 6B	17 3
Adair-Usher Process	..	...	1 6S	0 9B	...	...
Apex Mines	39 6B	41 6S	39 0B	38 0B	36 0B	36 0B
Bantjes Consolidated	25 0	24 9	25 0B	24 6B	24 9	24 3B
Benonis	6 6	6 0	6 3	6 1B	6 0B	6 3
Bushveld Tins	1 1	1 3S	1 1B	1 1B	1 11	1 3
Brakpan Mines	66 0B	67 0B	67 6	65 0B	66 6B	68 0B
British S A.	...	30 0S	...	...	...	...
City and Suburban	51 6B	51 3	51 6	51 3B	51 6B	51 0B
City Deeps	...	56 6B	57 6B	56 0B	56 0B	55 0B
Cloverfield Mines	7 1	7 11	7 0	6 4	6 2	6 0B
Cons. Langlaagtes	23 9B	23 3B	23 6B	23 0B	23 3	23 0
Cons. Main Reefs	20 6	20 3B	20 6	20 6	20 6	20 3
Cinderella Cons.	26 0B	26 6B	...	..	...	24 6B
Coronation Freeholds	0 7B	...	0 7B	0 7B	0 7B	0 8B
Con. Investment	22 6B	22 6B	...	21 0B	..	21 6B
Concrete Cons.	10 0B	10 0B	10 3B	10 0B	10 0	...
Crown Diamonds	...	...	5 0S	...	...	...
Clydesdales	11 0B	10 0B	11 0B	...	11 0B	11 0B
Cassel Coals	13 0B	...	...	...	...	...
East Rand Cent.	9 0B	9 3B	9 0	8 9B	8 9B	8 9
East Rand Coals	2 7B	2 6B	2 5B	2 6B	2 6B	2 6B
East Rand Deeps	3 3B	3 5B	...	...	4 0S	3 0B
East Rand Props.	67 0	66 6	65 0B	64 6B	64 6B	63 3B
East Rand Deb.	£94	£95	£94	£94	£94	£95
Eastern Gold Mines	2 0B	...	2 0	2 0B	2 0B	2 0
Govt. Areas	28 0	27 3	27 0	26 9	26 6	25 9B
Glencoe (Natal) Colls	6 6B	6 0B	6 6B	6 6B	6 6B	6 6B
Glynn's Lydenburgs	28 0	...	30 0S	27 0B	27 6B	27 6B
Glencairns	5 0S	5 0S	5 0S	5 0S	5 0S	5 0S
Ginsbergs	...	28 0B	...	28 0B	...	27 6B
General Minings	22 6B	22 0B	...	23 0S	23 0S	...
Jumpers	13 0S	13 0S	13 0S	...	13 0S	13 0S
Jupiters	13 9B	13 6B	13 3B	13 3	12 6B	12 9B
Kaalfontein Diamonds	0 8B	0 8B	0 8B	0 8B	0 8B	0 8B
Klerksdorp Props.	3 6B	3 8B	3 5B	3 7	3 5B	3 3B
Knight Central	15 6B	15 9	15 3	15 3B	16 3	15 9
Lace Props.	3 10	3 11	3 10	3 10	3 10	3 10
Lydenburg Gold Farms	9 0B	9 0B	8 9B	9 3S	8 10	8 9B
Luipaardsvlei Estates	8 0B	8 0B	...	7 9B	...	...
Main Reef Wests	29 0B	29 0	29 0	29 0	29 0	28 0B
M.R. West Deben.	£100	...	£100	£99½	£98	£100
Modder B's	58 9B	59 0	57 6B	57 0B	56 6B	53 9B
Midas Deeps	0 8	1 0S	0 6	0 6B	0 6B	0 7B
Middelvlei Estates	2 0B	2 0B	2 3S	2 1S	1 11B	2 1S
Modder Deeps	32 9B	32 6B	32 6	31 0B	31 0	30 0B
New Eras	8 4	8 0B	7 6B	7 9B	7 9B	7 10B
New Kleinfonteins	31 0B	31 3B	30 0B	...	30 6B	29 0B
New Rietfonteins	11 0	11 3	10 6B	10 3B	10 6B	11 0S
New Unifieds	17 6B	17 6B	17 6B	17 6B	17 6B	17 6
New Boksburgs	1 9B	2 0B	2 0B	...	2 0B	2 0B
Nigels	18 0S	17 0	17 0B	17 0B	17 0B	17 0B
Orange Diamonds	1 10B	1 10B	1 9	1 6B	1 6B	1 6B
Pretoria Cement Co.	56 0B	55 0B	56 9B	56 3B	57 6B	57 6B
Potchefstroom Est.	...	1 6B	1 6B	1 6B	...	...
Paardekraal Estates	0 8B	0 8B	0 8B	...	0 8B	...
Premiers Deferred	177 6B	...	177 6B	175 0B	180 0B	...
Premiers Preferred	165 0B	...	...	167 6B	...	...
Princess	12 0B	11 6B	11 6B	...	12 0	...
Rand Nucleus	3 3B	3 3B	3 3	3 2B	3 1B	3 3
Randfontein Estates	31 3	31 0	29 6S	28 6	28 9	28 0B
Randfontein Deeps	4 0B	3 9B	3 6B	3 6B	3 10B	3 6B
Rooiberg Minerals	33 6	33 6	33 3B	33 3	33 6	33 6
Rand Collieries	10 9B	...	8 0B	...	...	...
Rand Klips	6 10B	6 9B	6 3	6 3	6 0	6 0B
Ryan Nigels	4 0B	4 0B	4 0B	4 0B	...	4 0
Rood. Durban Deeps	25 6B	27 0B	26 9B	26 0B	...	...
Robinson Deeps	54 0B	54 0B	54 6B	54 6B	54 6B	53 0S
Salisburys	2 6B	2 0B	...	2 6B	...	...
Simmer Deeps	4 0B	3 9B	3 6B	3 3B	...	...
South African Lands	4 11	4 10	4 9	4 7B	4 8B	4 8B
S. Randfontein Deeps	3 8B	...	...	3 0B	3 3	3 2
Sub Nigels	6 6B	6 0B	6 0B	6 0B	6 0B	6 0B
S. A. Breweries	41 6S	41 6S	41 6S	41 6S	...	41 6S
Springs Mines	15 9B	15 9B	15 9	14 0B	14 6S	15 0S
Trans. G.M. Estates	46 6B	48 0B	48 0B	49 0B	48 6B	49 0S
Temple Tins	2 9B	2 9B	2 9B	2 10B	2 11	...
Trans. Coal Trusts	...	43 6B	43 6	42 0B	43 6	44 0
Tudors	..	2 0S	...	2 0S	...	..
Trans. Cons. Lands	...	...	31 0B	...	...	..
Van Ryn Deeps	21 6	21 3B	21 3	21 0B	21 3B	20 9B
Village Deeps	43 6B	43 6B	43 0B	43 0B	43 0B	42 6
Vogel. Cons. Deeps	1 1B	1 3B	1 1B	1 0B	1 1B	...
Witwatersrands	56 0B	56 0B	56 0B	...	...	55 0B
Wolhuters	21 3B	21 3B	21 0B	21 3	21 0	...
Witbank Collieries	42 0B	41 0B	41 6B	41 3B	41 0B	43 0B
Wit. Deeps	58 6B	58 0B	57 0B	56 6B	56 0B	55 0B
West Rand Est.	2 9B	3 6	3 0B	3 6	3 6B	...
West Rand Con.	12 3B	12 0B	...	...	...	...
Zaaiplaats	53 6	51 6	50 0	49 0	48 6B	45 6B

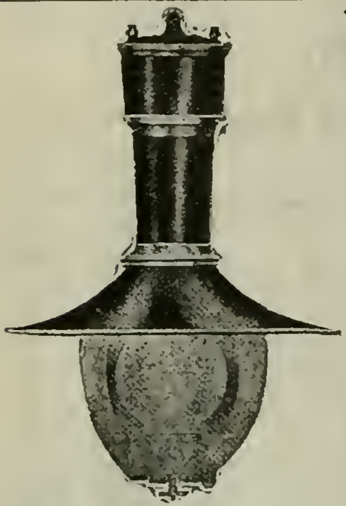
B Buyers. S Sellers.

New Unified.

The Directors' Report for the quarter ending March 31st, states: At the New Unified 31,410 tons were milled, for a yield of 11,322 ounces, equal to 7.209 dwts. per ton. Accumulated slime treated amounted to 3.749 tons, yielded 326 ounces, equal 1.739 dwts. per ton. Revenue from gold amounted to £48,094, or 30.623s. per ton: working costs absorbed £35,108, or 22.355s. per ton, leaving working profit £12,986, or 8.268s. per ton. Profit on accumulated slime amounted to £870, and sundry revenue to £287, making the gross profit £14,143. Capital expenditure absorbed £748, leaving £13,395 as net profit. The profits have been maintained at the level reached during the previous quarter. There was a slight increase in working costs, due to the running of the tube mill, but this was more than compensated for by the improved extraction which has been obtained. The main incline shaft was sunk 42 feet, and has reached a depth of 229 feet below the 14th level station, and a total depth of 2,563 feet. The development of the main reef leader continues to expose ore of a satisfactory grade.

New Rietfontein.

The Directors' Report for the quarter ending March 31st, states: Ore milled at the New Rietfontein totalled 49,131 tons, and yielded 14,994 ozs., equal to 6.104 dwts. per ton. Revenue from gold was £63,692, equal to 25.928s. per ton. Working costs were £52,784, or 21.487s. per ton, and working profit was £10,908, or 4.441s. per ton. Sundry revenue added £1,552, making the gross profit £12,460. Capital Expenditure took £3.138, leaving a net profit of £9,322. The total gross profit shows an improvement to the extent of £833, as compared with that for the previous quarter. The tonnage milled was increased by 1,337 tons, and the working costs were reduced by about 8d. per ton. No. 1 shaft was sunk 45 feet, and has reached a depth of 188 feet below the 12th level station. The 13th level station is being cut, and a cross-cut has been started northward to the reef. Driving both east and west has been proceeded with at the 12th level, but the ground is very much disturbed at this point owing to the proximity of the big downthrow fault. The borehole to the south of the big dyke, to which reference was made in the consulting engineer's annual report, was continued to a depth of 3.553 feet. The hole passed out of the Witwatersrand quartzites at 3,068 feet, and from that depth the formation consisted of igneous rock and talc chlorite schists. The hole was stopped at 3,553 feet.



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Engineering Notes and News.

Up-to-Date Machinery for Mozambique.

Two interesting equipments of sugar-milling machinery are, says *African Engineering*, on the point of being shipped from England for the extension of the factories on the Zambesi managed by Messrs. Hornung and Co. These have both been manufactured by Messrs. George Fletcher and Co., of Derby, and comprise a large eleven-roll mill, which is to form an addition to the Mopea plant, and some apparatus for increasing the evaporative capacity of the Caia installation of the Sena Sugar Factory Company. Modern methods of sugar extraction with multiple-roll mills have led to a far greater dilution of the juice with water than was the case when many existing mills were first put down. This water has naturally to be evaporated off again in the concentration of the juice, and a heavy additional demand is thus made on evaporators which are called upon to work in the new conditions. In fact, the output of a sugar factory is now largely governed by the capacity of its evaporating plant. With the object of meeting these conditions Messrs. Fletcher have introduced the apparatus under review. With it the evaporative capacity of an installation can be increased by at least 75 per cent., at a cost which is quite insignificant when compared with the expense of extending the plant on existing lines. The milling plant for the Mopea factory is a fine example of an eleven-roll mill capable of dealing with from thirty to forty tons of cane per hour. Messrs. Fletchers are supplying not only the mill and its gearing, but also the engines for driving it, the conveyors, etc. The mill comprises three three-roller mills, together with a Krajekski crusher driven by a separate engine. The mill rollers are 32 ins. in diameter by 66 ins. long, while those of the crusher are 26 ins. by 60 ins. The main mill engine is of specially heavy design. It is of the single-cylinder type, with an overhung crank and bored guides. It has a cylinder 28 ins. in diameter by 48 ins. stroke, and is capable of developing about 400 b.h.p. The crusher engine is of the same type with a cylinder 18 ins. by 36 ins., and develops 140 b.h.p.

The Commercial Economy of Turbine Pumps.

At the last meeting of the South African Institute of Engineers a lengthy and valuable paper upon "The Commercial Economy of Turbine Pumps," by Messrs. H. B. Maxwell and S. Zur Nedden, was read. The following remarks, taken from the concluding portion of the paper, deal with matters that commonly call for consideration in mining practice. Having pointed out that, though the manufacturer can doubtless do much to protect the customer against undue wear and tear, the users of turbine pumps can themselves contribute at least as large a share towards this end, the authors continue:—

> To ensure the selection of the most suitable material the customer can do much by supplying makers with water samples or analyses. Every conscientious maker of turbine pumps will use the best materials modern metallurgy is able to supply him with, and the expense incurred for high-grade material is always warranted, as it is almost incredible how much quicker bad or even indifferent material is worn out than a special "ships impeller" bronze, tough cast-iron, etc. But even the best material is powerless to combat chemical effects, and a bronze lining, if in perfect contact with cast-iron, often sets up electrolysis and hurries on destruction instead of preventing it. The principal means, however, by which the user can reduce the repair bill and increase reliability is a large and well-laid out sump. It is remarkable how seldom one finds a good sump in England as compared with the Continent, and, of course, there are reasons both for and against large sumps. Doubtless, Continental, especially German miners, often overdo the thing in blasting out a sump, the costs of which are many times greater than the sum spent for the pumps which are to benefit by it. But it is often possible, by a little timely deliberation when planning the drainage level of a mine, to arrange the pump station so that old cross-cuts can be used as sumps, and the authors have often found it possible to make use of the fact that a smaller height is required for turbine pump stations than for piston pump chambers, by partitioning existing pump stations horizontally into two parts, using the lower one as a sump for the new turbine pumps, which can then suck in the most

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desirable manner from directly below them. Whilst it is, therefore, often possible to obtain large sumps without any considerable expense the benefit derived from them is almost incalculable. 1. By allowing all the impurities contained in the water to thoroughly settle (for which purpose cross walls and hurdles in the sump are of great value) the wear will be reduced to a minimum, the repair bill kept low, the life of the pump lengthened, etc. An old miner once expressed his view that "the proper way to lift water is by a pump, and the proper means to lift solid matter is by a shovel and skip, and a good sump is the means of separating the solid from the liquid in order to then lift each by the proper means." This same man used an arrangement in his sump, consisting of a large basket filled with coke, which fitted tightly into the cross section of the pump. By means of the lifting tackle in the pump station this basket was exchanged every few days for an interchangeable one, and it was really incredible what an enormous amount of solid matter was found in the basket, and how clean the water pumped to the surface was. It is possible that by using limestone instead of coke, an additional purifying effect as regards admixtures of acids might be obtained, and that such arrangement might prove useful for ore mines in this form. 2. By accumulating the influx of at least 16 hours it becomes possible:—(a) To pump during one shift only and save the salary of at least two attendants; (b) to instal a bigger pump having a more favourable relation between duty and head, and, therefore, running at a better efficiency; (c) to avoid throttling the pump so that even with three-phase current the commercial efficiency is a maximum; d) to lengthen the intervals during which no repairs have to be made as the pump is only running one-third of the whole time; the incalculable factors generally combined with standstills for repairs are, therefore, lessened and the real economy will more nearly coincide with the original calculation; (e) to obtain a higher reliability of the plant as the sump prevents the mine from being flooded for a much longer time; (f) to improve the load factor of the power plant by pumping during the shift showing the minimum loads. The authors, therefore, would take this opportunity of strongly advocating a more universal introduction of large sumps in connection with turbine mine drainage plants. Questions of wear are surely in no case so decisive for the success and economy of turbine pumps as with *vertical high lift sinking pumps*. Here, as a matter of fact, the importance of the guaranteed efficiency nearly completely vanishes as compared with the costs incurred by only a short accidental stoppage, and the economy of a turbine sinking pump mainly, if not exclusively, consists in its reliability, its capability of withstanding the attacks of the worst possible water, and in its handiness in operation. It must further be borne in mind that in many instances the small space occupied by vertical turbine sinking pumps and their small weight, in proportion to their capacity, make it possible to sink shafts in the ordinary way, where, without them, it would be necessary to resort to artificial and expensive processes such as freezing or similar means—if sinking operations were not abandoned altogether. Of course, there is the undeniable fact that the head of centrifugal pump is inseparably connected with the speed. Now the squirrel-cage alternating current motor, being the simplest and safest motor to resist the influences of moisture, is, and will probably remain, the most suitable motor for a sinking pump. The speed of these motors is practically constant for all loads, while, on the other hand, the head and duty of the sinking pump must necessarily vary with the inflow of water and the increasing depth of the shaft. In the case of multi-stage pumps the difficulty can be overcome to some extent by means of dummy pieces which are replaced by proper impellers as the depth of the shaft increases. This method is, however, a somewhat poor compromise in so far as a gradual increase of the head is met by a few, but large, steps: moreover, the exchange of the dummy pieces for impellers involves a considerable amount of work and loss of considerable amount of work and loss of time, for to do this properly the pump must be raised to the surface and partially dismantled. A better solution of the problem has recently been adopted in several instances by providing separate generator sets for each sinking unit. In this way it is possible to run the pump at any speed which may be desired, and to suit it to the corresponding head. The economy resulting from this method is obvious. With this arrangement it is further possible to avoid another serious disadvantage in the application of squirrel cage A.C. motors for driving these pumps, viz., the shocks arising from the starting up of such motors against the brake torque, i.e., 30 to 50 per cent. of the full load torque, as the whole unit can be smoothly started up along with the generator. This method has also the further advantage that it permits of making up, by increasing the speed of the generator, for any deficiency in volume and head which inevitably occurs in every sinking pump. Especially whilst draining the shaft after blasting this method of temporarily speeding up, and thus pumping "full bore" until the bottom is dry again, is of great convenience in rapidly restarting the sinkers' work. Great progress has been made in improving the balancing arrangements of the rotor, and the cooling of the bearings both for the vertical pump and motor, and the developments of metallurgy year by year permit more powerful resistance against the influences of grit and sand. Probably the most important step towards perfection has been made by introducing means to overcome one of the greatest drawbacks of turbine sinking pumps, viz., their inability to run "on snore," i.e., when drawing air. In an article in the "Iron and Coal Trades Review" of March 29th, 1912, results are given which were obtained with Weise and Monski's turbine sinking pumps when sinking the Britannia pits of Messrs. the Powell Duffryn Steam Coal Co., Ltd., in South Wales. From this article it appears that in consequence with a first class general design a novel device enabled these pumps to draw air and to "pick up" immediately without repriming after they were practically half filled with air. This made the pumping such a success that, in spite of an inflow of about 17,000 gallons per hour, the pit in which they were working, and which had a diameter of 21 feet, has steadily progressed at the rate of 9 yards per week, i.e., quite as quickly as the twin shaft some hundred yards away, which happens to be nearly dry. About 90 yards, representing 10 weeks' work, could be sunk without overhauling the pump, in spite of the water containing great quantities of crystalline rock and impurities of every kind. It should be mentioned that this pump was driven by a motor which was connected to the common electric mains of the colliery in the ordinary way. If connected to a separate generator it would probably have been possible to double this period of operation without repair. Though to anybody not acquainted with sinking through crystalline strata 10 weeks may not seem a very long run for the interior parts of a pump, the contractor in that particular case will no doubt confirm that he has never sunk a wet shaft in a more economical manner, for the costs of any interruption in the sinking due to the pump would be much more than the money spent on spare parts and repairs. The question of economy again assumes a radically different form in connection with *boiler feed pumps*. Besides their great mechanical advantages, viz., absence of shocks, possibility of doing away with relief valves, smallness of space required, and absolute reliability, their economy is nearly always decidedly better than that of steam-driven piston pumps. The reason for this is a thermal one. Steam cylinders working intermittently and at only a few strokes per minute will always act more as condensers than as steam engines, as the inner surfaces are always considerably cooled down before fresh live steam enters the cylinder. On the other hand, the motor of an electric boiler feed pump utilises energy very economically. The only disadvantage on the part of the turbine feed pump is that is that it is generally not advisable to stop a turbine pump and restart it every few minutes. It is run right through, whether delivering its full or a reduced quantity, or none at all, and regulates itself automatically, because any tapping off at any part of the mains causes the mean pressure to fall off, and, therefore, the duty of the pump to increase correspondingly, and *vice versa*. It is clear that as the duty constantly varies the efficiency will also vary, and it is extremely difficult, if not impossible, to form an exact opinion as to the mean average commercial efficiency which might be expected, though in this instance the commercial and the technical efficiency are coincident. The difference between this mean average efficiency and the guaranteed normal efficiency does, however, not turn the scales of economy in favour of the steam pumping plant.

The South African Railways have accepted the following tenders: Coal for electric light works, Cape Province: 3,300 tons of pea coal, the Vryheid (Natal) Railway Coal and Iron Co., at 15s. 6d. per ton; 252 tons round coal, the Vryheid (Natal) Railway Coal and Iron Co., 18s. 6d. per ton; 3,080 tons pea coal, the Hatting Spruit Collieries, Ltd., at 13s. 9d. per ton. Natal coal: 5,000 tons smithy nut coal (washed) the Vryheid (Natal) Railway Coal and Iron Co., 3s. 9d. per ton; 4,800 tons pea coal, the Ramsay Collieries, Ltd.; 7,500 tons dross or slack, the Ramsay Collieries, at 4d. per ton; 6,880 tons nut pea and dross (mixed), the Ramsay Collieries, Ltd., at 1s. 7d. per ton; 3,000 tons household round, the Ramsay Collieries, Ltd., at 5s. 6d. per ton; 4,100 tons household nuts, the Ramsay Collieries, Ltd., at 4s. 6d. per ton. Steam coal for Natal: 30,000 tons steam coal, Natal Navigation Collieries and Estates, Ltd., at 6s. 7d. per ton; 20,000 tons steam coal, Elandslaagte Collieries, Ltd., at 5s. 9d. per ton; 30,000 tons steam coal, St. Georges' Coal and Estates Co., Ltd., at 6s. 6d. per ton; 21,000 tons steam coal, Natal Cambrian Collieries, Ltd., at 6s. 3d. per ton.; 17,000 tons steam coal, Natal Steam Coal Co., Ltd., at 6s. per ton; 42,000 tons steam coal, Dundee Coal Co., Ltd. (Burnside), at 6s. 6d. per ton; 10,500 tons steam coal, Ramsay Collieries, Ltd., at 4s. 6d. per ton, 25,000 tons steam coal, Sir W. H. Marling (Ballengeich), at 5s. per ton. Native Rations: Vegetables, Isaac Cohen; meat (beef), Fresh Meat Supply Co., Angehrn and Piel Brown and Lurie. Timber—Oregon pine planks: 12,000 ft., 12in. by 2in., Hillman Bros., at 3d. per foot; 31,000 ft., 12in. by 4in., Hillman Bros., at 6d. per foot. Oregon pine logs: 3,500 ft., 12in. by 12in., W. F. Johnstone and Co., at 69s. 9.5d. per 50 cubic feet; 1,500 ft., 14in. by 12in., W. F. Johnstone and Co., at 70s. 10d. per 50 cubic feet; 1,875 ft., 11in. by 14in., W. F. Johnstone and Co., at 70s. 10d., per 50 cubic feet; 1,875 ft., 16in. by 16in., W. F. Johnstone and Co., at 70s. 10d., per 50 cubic feet; 500 ft., 14in. by 12in., Hunt, Leuchars and Hepburn, at 69s. 9.5d. per 50 cubic feet; 625 ft., 14in. by 14in., Hunt, Leuchars, and Hepburn, 69s. 9.5d. per 50 cubic feet; 625 ft., 16in. by 16in., Hunt, Leuchars, and Hepburn, 69s. 9.5d. per cubic feet; 2,500 ft., 18in. by 18in., Felber, Jucker and Co., at 81s. 6d., per 50 cubic feet. 4,708 tons rails, high carbon open hearth, Bethlehem Steel Co., at £6 1s. per ton; 300 tons fishplates, high carbon open hearth, Bethlehem Steel Co., at £7 13s. 6d. per ton; 714 tons chairplates, high carbon open head, Bethlehem Steel Co., at £6 9s. 6d. per ton.

The best "Reef Traveller" is the *South African Mining Journal.*

Finance, Commerce, and Industries.

Small Traders and Credit.

Speaking at the annual meeting of the Merchants' Trust, Ltd., this week, Mr. J. Holcroft, after congratulating the members on the sound financial position of the company, said that at the last general meeting he had occasion to sound a note of warning against the outlook of trade at that time. "Unfortunately," continued Mr. Holdcroft, "there has been considerable depression during the last six months, and it appears to me from the number of meetings of creditors which has been held during the past few weeks that we are not yet at the turning point. Various causes are accountable for the present state of trade, but I wish particularly to point out that a large number of creditors' meetings are directly attributable to the credit so readily given by Oversea houses to the smaller traders. It is clearly evident from investigation into estates which have passed through your company's hands that indiscriminate credit has been given without the most simple business inquiries having been previously made into the financial position of customers. Our notice has been drawn to the fact that on several occasions traders whose local credit is limited to small amounts on short dates have been able to indent for large sums running into four figures on long terms of payment, and the easy way in which this credit is obtained has encouraged a class of unscrupulous persons to trade. This ruinous policy has resulted in large quantities of stock being realised on the open market at low prices, showing heavy losses to shippers and with detriment to the stocks held by merchants in South Africa. It has all along been the object and policy of your company to protect the interests of merchants, and I consider, therefore, that it is necessary to sound a note of warning to these Oversea houses, and ask them to inquire more thoroughly into the standing of customers requesting credit."

* * * *

Trade in March.

The Trade Returns for March show a slight set-back. Imports of merchandise into the Union during March amounted to £3,120,595, as against £3,223,534 in March, 1911. It is possible that this reduction is partly to be accounted for as a result of the coal strike in England, which in some cases may have delayed the execution of orders either in the factory or in transit. In support of this, it might be pointed out that the imports under the heading of machinery show a decrease of over £60,000, and there is a drop of £25,000 in importations of hardware and cutlery. On the other hand such classes of goods as iron and steel manufactures, leather goods, oils, stationery and books, and others, for supplies of which this country is largely dependent on English manufacturers, show no appreciable change. Moreover some of the most striking reductions in the imports are under headings which include necessaries of life. The inference therefore seems to be that if the English strike had any appreciable effect on local trade it was in the direction of encouraging the South African consumer to turn to South African sources of supply. It would however, be scarcely safe to attach much importance to such an inference, especially in view of the fact that during the same month our exports of South African produce also declined slightly (from £4,892,000 to £4,731,000), while the export figures for the quarter still show a considerable advance.

* * * *

United Building Society.

The annual report of the United Building Society of Johannesburg and Pretoria states that the year just ended has been one of marked advance. The net profit, together with the balance brought forward from last year, is £19,079 11s. 6d. The paid-up permanent share capital now stands at £38,200, an increase of £20,750. The amount to the credit of contributing shares held by investors has increased by £15,500—while the amount to the credit of borrowers on account of shares has decreased by £7,600. The total paid-up capital at date is £186,605—an increase of £29,600 on last year's figures. A slight increase is shown in the amount to the credit of depositors of £1,700—which appears mainly to the credit of fixed deposits. In the savings bank, 607 new accounts have been opened during the year and 522 closed, the number of current accounts open at March 31 being 2,126, with an average credit balance of £61 7s. 4d. The activity reported last year in the loan branch of the society's business has continued. The new loan scheme introduced three years ago has become increasingly popular as a means of assisting those who desire to obtain their own homes. The directors have dealt with no less than 478 applications for a total of £153,565—of these 453 have been granted for an amount of £145,405. Regarding securities, there are in all 928 properties situated in 97 townships on the Witwatersrand and in Pretoria. The total value is £574,351, and the amount owing thereon £271,612. The expenditure on United Buildings during the year has been £434—mainly on account of the installation of the system of water-borne sewerage. The net return from the building is £1,600, which is equivalent to a return of 6¾ per cent. on the amount at which it stands in the books. The reserve fund has been augmented by a further sum of £1,500, making a total of £11,500. The directors found opportunity during the year of investing portion of the surplus funds to the extent of about £12,000, which had been placed on fixed deposit with the National Bank, in advancing it under the new loan scheme. Notwithstanding this, the cash in hand at the end of the year stands at the satisfactory total of £58,971. The gross income from all sources has been £121,187, an average of £35,349 per month.

* * * *

Importation of Butter.

A sore point in connection with the importation of a consignment of Australian butter and its being carried on the railways at the South African produce rate is, according to "De Transvaaler," that the Government cold storage should have been used for the purpose of, wittingly or unwittingly, furthering the interest of the Australian butter-making. The cold storage in Natal costs the taxpayers nearly £2,500 per year to maintain. This sum is cheerfully paid so long as the institution is run for the purpose of promoting and assisting trade in South African produce. In this case it appears that the South African taxpayer has to pay for an institution that may occasionally be used to further the interests of a business run in competition against his own.

* * * *

Dynamite in Farming.

Few, in South Africa at any rate, realise the variety of ways in which dynamite can be made to serve the farmer. A properly utilised explosive is the farmer's best friend, particularly in this country, and demonstrations conducted by Mr. Kenneth Quinan, of the Somerset West Dynamite Factory, have convinced a number of prominent farmers in that district of this fact, and have already created such widespread interest as, in view of the few, comparatively, who have witnessed the actual experiments, is astonishing. The South African farmer is conservative in ideas and methods, but once the practical utility of an innovation has been demonstrated to him beyond doubt he freezes on to it with a persistence not to be surpassed by anyone in the world—and he is freezing on to dynamite ploughing. To Mr. Quinan belongs the credit for having introduced the possibilities of dynamite ploughing to the notice of South African farmers. It is unnecessary to state that Mr. Quinan is an expert on the whole subject of explosives, a highly technical, but extremely fascinating, branch of science which is revealing new possibilities almost every day.

S.A. Business Changes.

In the course of his speech at the special meeting held to consider the amalgamation question, the chairman of the Bank of Africa made the following important statement:—Anyone who knows South Africa knows how completely the condition of affairs has changed since ten years ago. Those were days of exaggerated values in property of all kinds, of wild speculation, of booming trade. They were followed by years of most severe depression, perhaps as severe as any country has ever suffered, and the recovery from that depression has been slow, gradual, but I think certain, up to a certain point. I do not imagine for a moment that real property will ever recover the exaggerated values at which it stood in those days. At present, as I have told you more than once, there is a quiet and steady progress in South Africa, but there is nothing more. South African Mines are not now a very favourite investment on this side of the globe. There is practically no speculation as compared with former days; the Johannesburg share market is a desert, or something very like it. There has been a change in other respects from which our business has suffered. We had a very good business with Indian traders. Indian traders, as you know, have become extremely unpopular with the white population in South Africa, and I might also say are now banned by the Government. The commercial business of South African seaports, of which we had a considerable share, has also very much changed in its nature. Up-country traders are now learning to give their orders direct to manufacturers on this side instead of being supplied, as they were formerly, by the great commercial houses of the South African ports. Altogether, there is a complete change, and though in the former years to which I have alluded there was ample scope for the existing South African banks—possibly even for more —in the business that was then transacted—still I am sure some will remember with sorrow how every bank suffered from that business in the times of depression. We do not want to see those times again. What I am endeavouring to impress upon you is that times have changed and that in the present circumstances South Africa is really " overbanked." Now, the result of that is, of course, very severe competition between the banks themselves and other financial institutions. Take the question of exchange; the yield has been cut down by competition to such a point that our receipts from it have very materially diminished. Take again the advances on loan. The rate of interest appears to be certainly on the decline. The position, therefore, is that business has much diminished, while the competition for it remains the same. In that competition we are handicapped by this important fact. As the circular that was sent to you tells you, we do not possess, and are never likely to secure, either the Government accounts or the support of the great mining houses, although we have some mining accounts. Therefore, we have not the command of funds in this competition which our rivals possess. Now, these are the reasons which induced us to believe that we should best consult your interests for the future by endeavouring to increase our resources and to lessen our expenses by amalgamation."

The Meyer and Charlton.

The Directors' Report for the quarter ending March 31st, states: Number of feet driven, sunk, and risen. 910 feet; ore mined, 43,821 tons; less waste ore discarded, 2,374 tons; ore sent to mill, 41,417 tons; total yield, 19,620.635 ozs. (9.461 dwts. per ton). Revenue, £83,497 (40s. 3d. per ton); working expenditure, £37,026 (17s. 10d. per ton); working profit, £46,471 (22s. 4d. per ton); capital expenditure, £5,346. A percentage of 11.06 per cent. of the net produce from mining operations is payable to the Government in respect of certain undermining rights leased to the company. The working profit exceeds that for the previous quarter by £6,510 9s. 6d.

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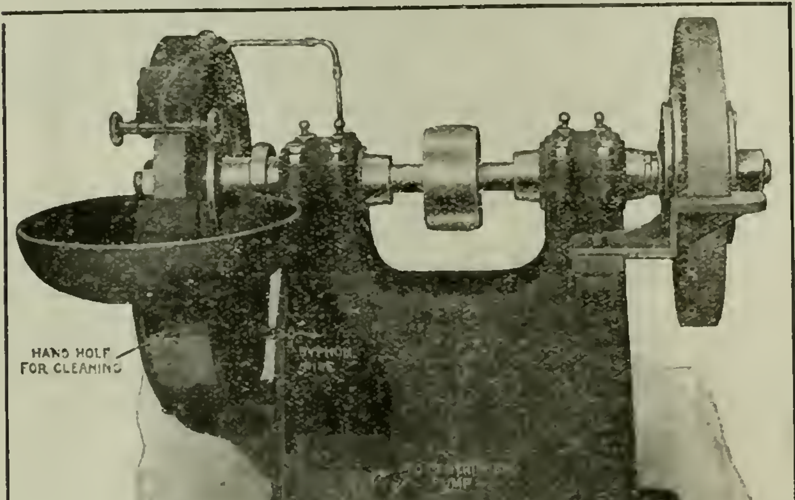

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PHOTOGRAPHY AND THE BIOSCOPE.

A Brief History and Review of their Evolution.

[By J. Symonds.]

During the second half of the sixteenth century, that is about the year 1500, a Neapolitan, Baptista Porta, discovered that the scenes outside his house were visible on the whitewashed walls of a darkened inner room, the image entering through a small orifice in the shutters. This is practically what happens in a camera obscura, and on this fact as a basis, photography is founded. Like many other important discoveries photography thus owes its birth to an accident. It was nearly three centuries later that it was rendered possible to obtain these evanescent pictures permanently. Thomas Wedgwood, son of the great potter, studied the action of light upon paper, white leather, etc., with a solution of silver nitrate. A paper dealing with the results of these experiments was published in the journal of the Royal Institution of Great Britain in 1802 by Sir Humphrey Davy. This process is too slow to admit of more than copying by contact from semi-transparent objects, and as no fixing bath was yet known, the copies were only washed in water. In 1814 Joseph Niepce found that bitumen was rendered partially insoluble by light. He immersed a bright metal plate in a thin solution this resin, and dried it; he exposed it to light in a camera obscura. He developed it by washing it in essential oils, which dissolved away the parts which were least affected by light, thus obtaining an imperfect image. This process was capable of giving a faithful black and white image, but was incapable of reproducing half tones. We now come to the real pioneer of practical modern photography, namely, Louis Jacques Mande Daguerre, who in 1829 joined forces with Niepce, and on Niepce's death, in 1833, carried out alone experiments which resulted in the once famous Daguerrotype process. In this process a polished silver plate was coated with the vapours of iodine and bromide, thus producing a surface of argentic iodide and argentic bromide. These plates are sensitive to light, and can be exposed in a camera in the usual way; the development is performed by suspending them in mercury vapour. This discovery was announced in 1839. Simultaneously in England, Fox Talbot was experimenting along the line of thought introduced by Wedgwood, and in 1839 read a paper on photogenic drawing before the Royal Society. His method consisted in coating paper with a solution of sodium chloride, drying it, and then sensitizing it with silver nitrate solution, in this way obtaining a layer of argentic nitrate and argentic chloride, with an excess of argentic nitrate present. This was an extremely slow process, and later on he discovered that an invisible image could be much more quickly formed by employing argentic iodide in place of argentic chloride. He developed this image with a solution of gallic acid and silver nitrate. This process is better known as the collotype process; it was patented in 1841, the use of gallic acid being due to J. B. Reade. By this means a negative was obtained capable of producing many positives, whereas the Daguerrotype was a positive, and as such could produce no positives. Paper was not a satisfactory support, and Niepce de St. F. Victor discovered that glass would support a negative, if first coated with albumen. A little later Le Gray suggested employing collodion, and Scott Archer with Dr. Hugh Diamond experimented with this substance, and made public their process in 1851. It was used till late in the 70's, and is, I believe, to some extent still used in the production of blocks for book illustration purposes. The carbon and similar processes were discovered in 1839 by Mungo Pontin, who also found that potassic bi-chromate, when impregnating paper, is sensitive to the actinic action of light. The wet collodion process was very inconvenient, but was somewhat improved by Sayce and Bolton, but the action was still exceedingly slow. In 1871 Dr. Maddox first produced gelatine negatives—that is, negatives in which gelatine is used as an emulsifying medium—but it was not till 1878 that the gelatine bromide plate was first produced. Much discussion has taken place as to the actual discoverer of this process, but only as lately as 1901 did the Royal Photographic Society of Great Britain award the progress medal to Dr. Maddox, who may, therefore, be considered the parent of the modern rapid plate. For the sake of convenience and portability negatives can nowadays be supported on strips of celluloid called films. A great saving of weight being made by thus eliminating the glass formerly employed. The latest invention in the photographic world is the bioscope or cinematograph. I will endeavour to briefly describe the various details connected with this. The human eye contains an extremely delicate organ, namely, the retina, on which the lenses of the eye focus everything we look at, thus producing the sensation of sight. An action which is quicker than 1/50 of a second is not seen distinctly. The eye obeys a certain physical law, technically termed persistency of vision, that is to say, if we look at an object and then shut our eyes, the retina retains the impression of that object 1/50 of a second after it is obscured from our view. The whole existence of the bioscope depends on this fact. I may here say moving pictures are not new. A tablet with an inscription gives us an account of an exhibition of moving pictures among the early Egyptians; the date of this tablet being fixed by archæologists at 200 B.C. The pictures were of course drawn or painted. Sir David Brewster, the famous natural philosopher, used to amuse his friends with a very simple experiment. He took a piece of cardboard about 3in. x 2in., on one side of which he had painted a canary, and on the other an empty cage. He caused this to rotate rapidly by means of strings, and the bird appeared to be in the cage. This illusion is due to the aforementioned persistency of vision or retinal impression. From this simple experiment he deduced certain facts which materialised in the kaleidoscope or zoematrope, and the stereoscope. It is often sold as a child's toy under the name of the wheel of fortune. Edward Muybridge, an English surveyor, while in Florida, was appealed to by two American gentlemen to decide a bet, as to whether there is a period when the body of a horse galloping at full speed, is entirely off the ground or not. Muybridge performed the following experiment: he fastened several cameras at even distances along a picket fence, and from the levers operating the shutters, he stretched threads, the ends of which he fastened to posts, and which operated electrical devices. A galloping horse was driven full tilt past the line of cameras, and thus a representative collection of photos were obtained. These were linked together end to end, and rapidly dropped in front of a magic lantern, which projected them upon a white sheet. His early apparatus may be seen to-day in the museum at Kingston-on-Thames, his birthplace. These were popularly called "photographs of process." Edison later invented the kinetoscope, and is the pioneer of the modern machine. The celluloid film was invented by a Frenchman named Leumayer. Having briefly outlined the history of the bioscope, I will give you a brief account of the machine itself and its working details. The special camera is used for taking bioscope negatives, the negative film being generally divided into lengths of 165 feet. The standard width is $1\frac{3}{8}$in. with 200 perforations to $37\frac{1}{2}$in. on each side. This works out at four perforations per picture on each side. The perforations are machine punched to ensure extreme accuracy and supply the means of propelling the film through the camera. It is essential that they should be quite accurate to produce a steady negative. The unexposed film is first placed in a box, which is then fitted inside the camera at the top, care being taken that the film should not be exposed. The box is removable so that this can be done in a dark room and extra boxes can be filled ready for replacement. The film passes under a plain roller and over a flanked roller, then under a grip roller, and over a sprocket. It passes now through a film-gate—that is, a frame with an aperture the size of the finished picture and is held secure by springs. It now passes under a grip roller and over a sprocket. Thence it passes over a plain roller into an empty film box, where the end of the film is clipped on to a spindle. The mechanism is driven by a handle, external to the camera. The usual speed of turning is about 16 pictures per second, and as 8 pictures are exposed for each revolution of the handle, the speed is two turns per second. In English machines, the gearing is 8 to 1. The negative is developed by winding on a wooden frame and then subjecting it to the action of some suitable developer. The negative is dried by winding on a large wooden drum, which is rapidly revolved by mechanical power and warm air is circulated in the room by powerful fans. All dark places are cut out and the sections joined up; the negative is now finished. It is now wound on a spool, and is placed in the printing machine, where in contact with lengths of unexposed film, it is passed at a suitable rate before a light, generally a Nernst lamp, to which it is exposed. The new film is now developed and dried, and is, of course, a positive, and as such is ready to be projected on the screen.

The cinematograph may be roughly divided into three sections: (1) Lantern; (2) The projector; and (3) The shutter. We will first deal with the lantern. This is generally made of stout Russian iron fitted with a ventilating cowl on top and door on each side. The back is fitted with a screen of non-combustible material such as asbestos. It is generally fitted with some device, by which it may be tilted to any desired angle. The light from the electric arc used in the lantern, passes out through two lenses, which form what is termed a condenser, one of these lenses is bi-convex, the other is meniscus-convex. These lenses cause the rays of light to converge to a focus at a distance midway between the two sets of lenses which form a cinematograph, or the objective lens. At a suitable distance between the condenser and the objective lens is the projector. The projector is the part of the machine through which the film passes, and includes the mechanism required to propel the film. The foci of cinematograph lenses range from one to seven inches, two and a half to four inches diameter being usually employed. There are two types of projectors commonly used: one the Maltese Cross movement, of which imparts the required intermittent movement to the film through a sprocket wheel, by means of a revolving pin engaging in a slotted disc attached to the sprocket spindle. At each revolution this pin causes the sprocket wheel to revolve sufficiently to pull the film the space of one picture through the gate, the teeth of the sprocket wheel engaging in the perforations of the film. The second type is the dog movement, which takes many forms, but the principle is always the same. It consists of a roller or its mechanical equivalent, revolving on a centre on the sun and planet method. At each revolution the dog strikes the film, which is being fed forward by a sprocket wheel, and causes it to pass through the gate of the projector with an intermittent motion. The period of rest in the gate as compared with the time taken to move the film the desired distance is dependent, therefore, upon the action of the dog in pulling it down

16-50 pictures per second, generally 16, thus velocity is from 1-3⅛ foot per second. It is, therefore, evident that each picture is stationary while in the gate. By means of a shutter, with which we shall presently deal, the light is cut off, and the next picture is dragged into place: the period taken to do this is 1/30-1/50 of a second, an impression left by the previous picture on the retina of the eye lasting this time, and the short period of darkness is not perceptible. This is why I said previously that the whole existence of the bioscope depends on the law of persistency of vision. The Maltese Cross movement allows of a quicker pull down of the film, consequently reducing the flicker almost to a vanishing point, and thus gives a more brilliant picture. It is more silent than the dog motion, but suffers more wear, and the film perforations also wear under the action of the sprocket teeth. In the dog movement complete silence is not obtainable, but being cheaper and of a heavy construction, with the resulting absence of wear and tear, it is less liable to break down and is more often employed. The last item is the shutter. In appearance it often looks like a flat propeller blade, and is revolved in front of the objective lens. By suitable gearing a blade of the shutter cuts off the light which the lantern projects on the screen, while the film is in motion; it is this shutter which produces the flicker visible to the audience. The last stage of photography is that by which direct colour photographs can be made at one exposure. Four films now supply the apparatus materials necessary for this; they are the Lumiere Autochrome, the Thames, the Omnicolore and the Du Fay Companies. The processes are nearly identical. The Autochrome plate is really a screen plate, the screen of dyed starch grains lying between the sensitive emulsion and the glass. The starch grains are dyed in three colours—red, green and violet. These are primary colours, and by properly mixing them any other colour may be obtained. The grains, which are not visible to the naked eye, are uniformerly spread over the glass. The plate is put into the camera with the glass facing the lens, contrary to the usual practice. The red grains only pass red light, the green, green light, and the violet, violet, light. When the plate is developed the silver is blackened where the light has reached it through the grains, and the plate is now put into the reversing bath, which dissolves away the developed silver, leaving untouched the unexposed silver. The plate is now exposed to light, and may be developed to light till the silver is blackened. On holding the plate up to the light we get a positive image, and we see the colour of the starch grain, which is the same as that of the light it originally transmitted. When mixed colours fall on the plate, they pass through all three sets of grains and affect the emulsion behind proportionately, resulting in the original colour. The emulsion on the plate is pan-chromatic or sensitive to all colours, and no light is really safe to develop it by. The factoral method being generally employed in an almost dark room. The Thames plate differs only from the above in that the colour screen is made of dyed spots on gelatine, and is therefore more rapid. In front of the lens is placed a suitable filter screen. By the courtesy of Mr. W. Martin, manager of the Bijou Theatre, I was enabled to examine the machines while in operation, and to this gentleman I am indebted for much of my information. Two makes of machines are in use at the Bijou—one is a Butcher's Empire, and the other a Tyler-Ernemann. The German machines, hitherto the best, are now giving place to those of English manufacture. Direct current from the town supply is delivered at 440 volts, and, by means of auto-converter, is cut down to 220 volts. The incandescent lights work at this voltage. In the operating box 220 volts mains are brought in, and by means of rheostats are cut down to 50 volts with a current of 45 amperes, at which the hand-fed arc is worked. The arc is actuated by rack and pion. The protective gear consists of 50 ampe fuses in iron-clad cases, two A.P.S.B. switches with copper context, and one iron-clad cut-out. The operator is able to regulate his arc to a nicety by means of a volt-meter and an ampe-meter, both by the G.E.C. The films are rewound with a hand winder in the operator's room, which is composed of wood, and has an automatic door and trap at top. All the wires are insulated, and either run through pipes or are covered with asbestos, and there is an automatic fire extinguisher in the room.

The Zaaiplaats Tin Mining Company, Ltd.

The following is a copy of a telegram from the mine manager, Zaaiplaats Tin Mining Co., Ltd., dated May 2: "Have cut No. 13 main ore body with the two western development drives. Width so far exposed, 22 feet, with ore still going in on south side. Height, 11 feet, with tin still in roof. Value, average grade, rich on foot wall. Course of ore body, due west, dip 30 degrees. Assuming this as average course and dip distance to boundary 1,600 feet. Pushing work here with one machine drill and sixteen hammer boys, working three eight-hour shifts. We have just completed a trial run of the new 220 h.p. gas suction plant; highly satisfactory. Despatching to-day from Potgietersrust eight truck loads, 86½ short tons concentrates for shipment to Singapore."

Rooiberg Minerals.

The following are the particulars of the estimated results of operations on the Rooiberg Minerals Development Company's property for the month of April: 10 stamps, ran 29 days; tons milled, 1,540 (short); concentrates, 58 long tons; average assay value metallic tin, 70 per cent.; net capital expenditure, £8,548; estimated profit, £3,185; adjustment due to fluctuations in the price of tin to be added to estimated profit in respect of December shipments, £56; gross profit for month, £3.211. The concentrates in reserve at the 30th April amounted to 17 tons (2,240lb.), of the net value of £1,616.

The battle of the ports has taken on a new phase. According to a Press correspondent, Durban will challenge the Cape ports for supremacy this year, as it is expected the wool export will reach 125,000 bales. "The wool season has been an excellent one, though the wool as a rule has contained more grease than last year, which accounts for a slightly lower price per lb. There is, of course, much competition between the ports, though each has its own hinterland. In years gone by Port Elizabeth was the premier wool port, but that position has now been challenged by East London and Durban. It is evident that Durban is going ahead as a wool-exporting centre, where two large firms of wool brokers are erecting big additional wool stores, which are to be ready for next season's trade."

Tenders Accepted.

The following tenders have been accepted for the supply of forage and other stores to the South African Police during the period of twelve months commencing the 1st April, 1912:—Warder and Bredell: Oat-hay, mealies, lucerne, oats, bran, bedding, and rock salt, to the Johannesburg District; B. Mendelsohn, Ltd.: Oat-hay, mealies, lucerne, oats, bran, bedding, and rock salt, to the Germiston and Boksburg Districts; B. Mendelsohn, Ltd.: Oat-hay, mealies, bran, bedding, and coarse salt and candles, "free on rail," Boksburg; Malcomess and Co.: Rock salt, "free on rail," East London: Middelburg Coal Agency: Lime, "free on rail," Braamfontein; C. W. Champion: Lime, "free on rail," Bloemfontein: Pretoria Coal, Co.: Coal (nut), "free on rail," Douglas (pit mouth); W. G. Lay: Medical and veterinary prescriptions to Johannesburg, and veterinary drugs and instruments, "free on rail," Kazerne; E. J. Adcock: Medical and veterinary prescriptions, to Krugersdorp; Heynes, Mathew, Ltd.: Medical and veterinary prescriptions and photographic material, to Bloemfontein; Phillips and Co., Ltd.: Medical and veterinary prescriptions, to Pretoria; T. E. Jolly and Co.: Medical and veterinary prescriptions, to Roodepoort; B. Owen Jones, Ltd.: Medical and veterinary prescriptions, to Boksburg; Lennon, Ltd.: Medical and veterinary prescriptions, to Germiston: Lyle Bros.: Head collars and brass brooms, "free on rail," Pietermaritzburg, Bloemfontein, and Capetown: Wevell Bros.: Horse shoes and nails, "free on rail," Pretoria West; Hannam and Co.: Soft soap, "free on rail," Pretoria West: Parker, Wood and Co.: Soft soap and whitewash brushes, "free on rail," Pietermaritzburg; African Indent Merchants: Hair brooms, "free on rail," Pietermaritzburg, Bloemfontein, and Capetown; A. Johnston and Co.: Whitewash brushes, "free on rail," Pretoria West; also for the supply of uniforms, etc., to the Customs Department:—A. Fraser and Co., Capetown: Uniforms A, £2 10s. 6d., uniforms B, £2 2s. 3d. per uniform; A. Fraser and Co., Capetown: Overcoats, £1 ts. per garment; A. Fraser and Co., Capetown: Caps 6s. 9d. per cap; A. Fraser and Co., Capetown: Leggings, 5s. 9d. per pair; M. Eilenberg and Co., Ltd., Capetown: Macintoshes, £1 8s. 7d. per garment; University House, Durban: Boots, 6s. 9d. per pair. For the various services mentioned:—G. F. Warren, P.O. Box 234, Potchefstroom, £1,450, erection of school and teachers' quarters, Kippan No. 263, Klerksdorp; G. F. Warren, P.O. Box 231, Potchefstroom, £1,826, erection of school and quarters at Fouriesgraaf No. 303, Bloemhof; G. F. Warren, P.O. Box 234, Potchefstroom, £890, erection of teachers' quarters at Geluk No. 97, Lichtenburg; W. C. Pijpers, P. O. Lichtenburg, £1,400, erection of school and quarters at Doornpan No. 137, Lichtenburg: W. C. Pijpers, P.O. Lichtenburg, £825, erection of teachers' quarters at Holfontein No. 186, Lichtenburg; W. C. Pijpers, P.O. Lichtenburg, £800, erection of school and quarters at Cyferfontein No. 251, Lichtenburg; W. C. Pijpers, P.O. Lichtenburg, £1,425, erection of school and quarters at Welgevonden No. 281, Lichtenburg; W. W. Peffers, 8, Cricket Street, Bloemfontein, £5,000, erection of boarding-house, etc., at the Eunice High School, Bloemfontein.

QUARTERLY REPORTS.

Lancaster West.

The chief points in the report of the directors of the Lancaster West for the March quarter are:—Number of tons milled, 66,270; revenue from gold, £70,049; working expenses, £69,070; cost per ton milled, 20s. 10.142d.; working profit for the quarter, £978; profit per ton milled, 3.542d.; sundry revenue, £1,839; debenture service charges, £890; balance profit for the quarter, after deducting capital expenditure, £131. In mine development there were 29 feet of sinking on the Battery Reef and on other developments. The footage driven, risen and sunk on the Battery Section and sampled totalled 1,185 feet, averaging 7.57 dwt. over 28.65 inches; and on the Botha Section, 265 feet, averaging 7.23 dwt. over 32.96 inches. These figures are subject to re-calculation at the end of the year, when block values are made out.

New Goch.

The Directors' Report for the quarter ending March 31st, states: Number of feet driven, sunk and risen, 1,724 feet; ore mined 109,906 tons; less waste ore discarded, 30,621 tons; ore sent to mill, 79,285 tons; total yield, 20,275.057 ozs. (5.092 dwts. per ton). Revenue, £86,065 (21s. 7d. per ton); working expenditure, £71,402 (17s. 11d. per ton); working profit, £14.662 (3s. 8d. per ton); capital expenditure, £618. The decrease of 11,025 in the tonnage milled and £11.049 6s. 10d. in the working profit, as compared with the previous quarter, is due to the shortage of native labour, prevailing for some time past, having prejudiced the scope of development operations, but it is anticipated that the improved supply of natives now obtaining on the mine will enable a return to normal conditions in the course of the next few months.

Robinson Deep.

The Directors' Report for the quarter ending March 31st, states: During the March quarter at the Robinson Deep Gold Mine, 2,947 feet were driven, risen, and sunk, developing an estimated amount of 114,481 tons, as against 149,600 tons milled. The total yield was 56,051 ozs., or 7.493 dwts. per ton, valued at £231,956, or 31s. 4.935d. per ton. Working costs amounted to £127,896, or 17s. 1.181d. per ton, and working profit to £107,060, or 14s. 3.754d. per ton. Sundry revenue amounted to £2,661, and after allowing for additions and renewals, profits tax, shaft sinking, and bewaarplaatsen annuity, there remained a net profit of £76,364. Capital expenditure amounted to £15,806. In addition to the sum of £7,500 appropriated for additions and renewals fund. an amount of £5,000 13s. 2d., being the value of 1,193 ounces fine gold recovered from the dismantled mill plates, has been placed to the credit of that, and is not included in the profit for the quarter. The sum of £15,000, appropriated for the payment of the bewaarplaatsen annuity, represents an amount of £5,000 per month, which the directors have decided to set aside out of profits for that purpose. At March 31, 1912, the gold in reserve was 4,552 ozs.

Witwatersrand.

The Directors' Report for the quarter ending March 31st, states: The Witwatersrand Company milled 105,710 tons, and recovered 30,098 ounces, or 5.694 dwt. per ton milled. Revenue from gold totalled £127,848, or 24.188s. per ton, and sundry revenue amounted to £4,903. Working costs absorbed £83,819, or 15.858s. per ton, leaving a working profit of £44,029, or 8.330s. per ton. Including sundry revenue, the gross profit was £48,932. Capital expenditure amounted to £1,659, leaving a net profit of £47,273. The amount expended on the development and equipment of the southern section was £17,088. The grade of the ore milled showed a further improvement, and the tonnage milled was increased by about 2,000 tons. As a result, the total gross profit was higher, as compared with that for the previous quarter, by £2,421. As the native labour supply is now adequate, it is hoped that the amount of ore crushed will be still further increased during the present quarter. The vertical shaft was sunk 359 feet to a total depth of 1,303 feet, and the northern incline shaft was sunk 126 feet to a total depth of 898 feet. The fourteenth level station in the incline shaft was cut during the quarter, and a crosscut started to the reef. Development in this section of the mine is exposing reef of very satisfactory value.

Government Mining Areas.

The directors of the Government Gold Mining Areas (Modderfontein) Consolidated Company, report as follows, for the quarter ending 31st March, 1912:—North-east shaft: This shaft was sunk 401 feet to a total depth of 1,821 feet. The shaft continued in diabase to 1,502 feet, when a band of quartzite, 30 feet in thickness, was encountered. Underlying this formation was about a foot of reef matter, succeeded by 20 feet of dyke. At 1,552 feet the shaft passed into quartzite, with occasional reef stringers, and was still in this formation at the end of March. North-west shaft: This shaft was sunk 463 feet to a total depth of 2,072 feet. The shaft was in quartzite throughout the quarter. South-east shaft: This shaft was sunk 583 feet to a total depth of 1,971 feet. Conditions have been favourable for rapid sinking in this shaft, and an excellent footage has been obtained. In March the depth sunk amounted to 233 feet, which is a record for vertical shaft sinking. The shaft was in quartzite to 1,714 feet, when the slates were encountered and continued to 1,754 feet. From 1,754 feet to 1,858 feet alternate bands of slates and quartzites were passed through, underlying which there was another band of slate measuring 56 feet in thickness. The shaft then passed into hard-grained quartzite, and continued in this formation till the end of March. South-west shaft.—This shaft was sunk 489 feet to a total depth of 966 feet. The formation passed through consisted principally of quartzite. At 920 feet a reef with large pebbles was intersected. This reef measured 18 feet in thickness, and would appear to belong to the Kimberley Series. The erection of two 50-drill air compressors has been completed, and steady progress has been made with the construction of the railway sidings to the shafts. The twelve additional married quarters, the erection of which was commenced at the end of the year, are nearing completion. The native labour supply has been equal to our requirements, and this accounts to a large extent for the satisfactory progress which has been made. There has been an increase in the amount of water to be dealt with in the two northern shafts. This has interfered a little with the rate of sinking, and has had a tendency to put up the cost. None of the reefs encountered in the shafts contained payable values.

Ginsberg.

The Directors' Report for the quarter ending March 31st, states: The Ginsberg crushed 38,905 tons for a yield of 13,975 ozs., or 7.184 dwts. per ton. Revenue from gold was £59,363, or 30.517s. per ton, working costs were £41,830, or 21.503s. per ton, and working profit £17,533 of 9.014s. per ton. Sundry revenue realised £570, making a gross profit of £18,103. Capital expenditure amounted to £1,564, the net profit being £16,539. The gross profit shows a further increase of £1,677 as compared with the profit realised during the preceding quarter. The tube mill was started in January, and has run very successfully since. As a result, there was an increase of 1,626 tons in the quantity of rock milled, and the extraction has been considerably improved. A commencement was made towards the end of March with the deepening of the north shaft, which was sunk 17ft. to a total inclined depth of 1,424 feet. The development during the quarter consisted chiefly of winzing in the northern section, and the results obtained were satisfactory.

Glencairn.

The Directors' Report for the quarter ending March 31st, states: At the Glencairn 53,254 tons were milled for a yield of 10,006 ounces. equal to 3.758 dwt. per ton; 7,282 ounces of accumulated slime were treated, and yielded 974 ounces, or 2.674 dwt. per ton. The revenue from current gold was £42,501, or 15.963s. per ton milled; working costs absorbed £37,722, or 14.168s. per ton, leaving a working profit of £4,779, or 1.795s. per ton: sundry revenue amounted to £373, and profit from accumulated slime to £2,619, making the gross profit £7,772. Capital expenditure took £99, leaving a net profit of £7,673. It was found necessary to carry out certain repairs to the mill engine, and as a result the tonnage crushed shows a decrease of 5,186 tons as compared with that for the previous quarter. Owing to the small toonage there was an increase of over 1s. per ton in working costs, and the total gross profit was reduced by £853. However, the plant is now working well, and the position with regard to native labour is satisfactory, so that the fall in profit will probably be recovered during the present quarter.

New Kleinfontein.

The report of operations on the New Kleinfontein Co. for the three months ended the 31st March states that from 116.330 tons milled the estimated revenue from gold was £163.409 which, less realisation charges, £2,425, left a net revenue of £160,985. Working costs absorbed £116,559, or 20s. 0.472d. per ton, and the net working profit was £44,426, or 7s. 7.655d. per ton. On mine development, 578 feet of shaft sinking was done, and 4,121.5 feet were driven, risen, and sunk. The footage sampled was 2,110 feet, which, over an average milling width of 43.46 inches, gave an average assay value of 8.87 dwts. The estimated tonnage developed by drives, etc., was 105.788 tons, which, over an average milling width of 45.09 inches, gave an average assay value of 7.65 dwts. The apparent difference in footage sampled and ore values is accounted for by the latter being estimated from drive values only. Capital expenditure amounted to £35.464. The ore reserves at the end of the quarter were as follows: Payable: 1,156.316 tons; milling width, 44.54 inches; value, 7.49 dwts. Unpayable: 454.730 tons; milling width, 40.66 inches; value, 3.67 dwts. Totals and averagess: 1,611.046 tons; milling width, 43.44 inches; value, 6.41 dwts.

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→ **3** ←

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Automobile Notes.

The Motor Traders' Cup.

The Transvaal Automobile Club announce the competition for the Motor Traders' Cup (open to private drivers only) and the competition for the Transvaal Automobile Club Cup (an open event) to be held on Thursday, May 16th, 1912. The following are the particulars and rules governing the competitions:—The events will be contested simultaneously on the above date, the course chosen being from Baragwanath's Hotel via Jackson's Drift and Van Wyk's Rust, back to Baragwanath and vice versa. Distance 4 laps of 21 miles each. The Motor Traders' Cup route to be from Baragwanath to Van Wyk's Rust via Jackson's Drift, back to Baragwanath. The Club cup route to be from Baragwanath to Jackson's Drift via Van Wyk's Rust back to Baragwanath. These competitions are open to members of the Club only, who are eligible under the following conditions:—That their subscription up to the 31st March, 1912, has been paid: (a) For the Motor Traders' Cup, only those who are not in any way connected with practical motor trading; (b) For the Club Cup, open to all members of the Club. Each competitor must nominate an observer who will be subject to the approval of the Committee, and who will ride beside the driver. All competitors must report at the Municipal Weighbridge, Market Square, between 8 and 9.30 a.m., and there be weighed in racing condition, thence proceed to the Junction Hotel, Baragwanath, to receive their official competing number, copy of rules, observer's card and badge. There will be a control at Baragwanath of half-an-hour between first and second lap, one hour between second and third, and half-hour between third and fourth laps. Cars on arrival at Baragwanath (in either competition) at each lap must come to a standstill at a spot marked by a flag, where the time will be taken. Petrol and water only may be filled in at the Control under the direction of the Club official. No repair or adjustment of any kind will be allowed excepting the repair of punctures, as provided for in the rules. Cars must be in touring condition, and any ballast may be carried. The formula employed in each competition will be based on total weight of car, etc., in lbs. miles per hour and horse power. To constitute a stop both engine and road wheels must be at rest at the same time. Punctures may be repaired provided the engine be kept running the whole time. In both competitions the Cups must be won twice before becoming the property of the winner, but not necessarily in succession. Prizes:—(a) Motor Traders' Cup, first prize, the Motor Traders' Cup and Club Gold Medal; second prize awarded by the Club; also third prize awarded by the Club. (b) Transvaal Automobile Club Cup, first prize the Club Cup and Gold Medal; second prize awarded by the Club; third prize awarded by the Club.

The T.A.C. Annual Meeting.

Among other suggestions considered by the T.A.C. at their annual meeting last week was one embracing a scheme to hold an annual motor show of a thoroughly representative character, and to invite the co-operation of the South African Society of Motor Traders to assist in the matter. In support of the proposal an inference was drawn from the success which attended the recent exhibition of motor vehicles in connection with the agricultural show, which was highly gratifying when one considers the counter attractions which the numerous other displays afforded. The meeting, it may be remarked, was quite in agreement with the views so often expressed in these columns, that the holding of a separate exhibition is desirable and justified owing to the important position which the motor business undoubtedly occupies in the industrial life of the country. Having in view a movement of this description it might be suggested that a census of opinion be obtained from among the motor traders and other car manufacturers' representatives on the general aspects of such a show, and assuming that the majority would be favourably disposed towards it, a basis to work upon might be secured if support were guaranteed. The Transvaal Automobile Club are prepared to further the scheme in every way possible, but, in the absence of a definite understanding between individual traders to assist, the promoters cannot in reason anticipate other than failure.

Road Maps.

The important question of road maps was also discussed at the meeting referred to, and regret expressed at the meagre headway which, despite considerable attention from the Club Committee during the year, they were compelled to recognise.

An Interesting Visit.

Much interest attached to the recent visit of a lady motor cyclist to the Rand, which was reached from Capetown after some five weeks' experience with a 2½ h.p. machine. This time, however, included several days' rest for recuperation at various points en route. Durban is the cyclists's objective eventually, the itinerary providing for a stay at Johannesburg, which was reached with many adventures, happily none being of a serious nature. Mention is primarily made of this incident to illustrate the possibilities of the present day motor cycle, and its value in South Africa, where roads, in many parts, are the exception rather than the rule, and the unbeaten track is still largely encountered. It is admitted that, apart even from the exclusion of the automobile, the motor cycle has been popularised, chiefly on the score of utility, to an extent probably unprecedented in the history of any other machine introduced for purposes of locomotion.

The re-election of the present worthy occupier of the civic chair, Mr. J. Dowell Ellis, to the position of president of the T.A.C. for the ensuing year, is announced. The appointment has met with a popular recognition, not alone in Club circles, but from the entire motorist community, who for long have admired Mr. Ellis's sporting proclivities, and the more important interests he has at heart, particularly in regard to the betterment of the existing roadways of the country.

An Expert's Views.

Mr. Charles Jarrott, the eminent motor expert, who recently shared with Mr. F. S. Edge a trip by motor car through a considerable portion of Southern Africa, in favouring a contemporary with his opinions on the road system of this country, couches his views in a decidedly more favourable light in regard to the present system than do the residents in the respective parts he refers to. According to this gentleman's ideas our roads compare creditably with those on the Continent of Europe and elsewhere. Mr. Jarrott, as it happens, speaks with authority on road systems, having had a unique experience in this direction in many countries during his wide travels in the interests of motoring. His views, therefore, are generally accepted on these matters. South Africa, however, or that portion of it which has evoked the visitors' comment, may be classed as a roadless country, in the proper acceptation of the term, and no amount of argument will convince, especially the much-travelled South African motorist, to the contrary.

Motor Cyclists.

Motor cyclists request that drivers of cars will allow them more room when passing or meeting them. So far as the width of a motor cycle is concerned, it, of course, practically requires no more room than an ordinary cycle, but the cyclist riding the latter can proceed with safety in places where a motor cyclist dare not, on account of the great liability to skid. Recognising that the dry season has set in, the risk of side-slipping may not be very great at present, but the roads are often sufficiently greasy through street watering, etc., to involve the danger pointed out. A recognition, therefore, on the part of motor car drivers to this end, and a consequent exercise of discretion in the matter, will earn for them the gratitude of the ever-increasing number of patrons of the two-wheeled machine.

Contracts Open.

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of fencing material and gates (May 28).

The Municipal Council of Johannesburg invites tenders for the supply of electric lamps and cut-outs (May 17); also for re-filling broom stocks (May 22).

The Municipal Council of Johannesburg invites tenders for mackintoshes (June 1); also spares for stone crusher (June 11).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for structural steelwork, etc., for new foundry at Pretoria (June 4); also for disinfectants (May 21); also for the supply of 876 Petersburg standards of Baltic timber (May 21).

The Secretary to the Tender Board, S.A.R., Headquarter Offices, Johannesburg, invites tenders for the supply of 2,741 Petersburg standards of Baltic timber (June 11).

Mr. Archer W. Hoskings, architect, Consolidated Buildings, Johannesburg, invites tenders for the erection of St. Aidan's Church, Yeoville.

The Rand Mines, Ltd., Buying Department, Box 1594, Johannesburg, invites tenders for the supply of the whole or any portion of the requirements of mealies to the Companies controlled by the Rand Mines, Limited, for a period of twelve months from 1st July, 1912.

The Municipal Council of Krugersdorp invites tenders for 50,000 Imperial gallons of creosote (May 13).

The Municipal Council of Krugersdorp invites tenders for certain extensions and additions to the electric light supply and power mains, under the following heads: (1) Overhead material and mains: (2) Cables and joint boxes; (3) Booster and switch board (May 15).

The Municipality of Boksburg invites tenders for the supply of 2,000 gallons of creosote in drums (May 14).

The Municipality of Boksburg invites tenders for the supply of rolling stock, converter plant, and overhead material, required in connection with trackless tramways (June 26).

The Municipality of Benoni invites tenders for the supply of one hundred and fifty water meter boxes (May 15).

The Roodepoort-Maraisburg Municipality invites tenders for the supply of electric light materials for the period ending 31st December, 1912 (May 13).

The Potchefstroom Municipality invites tenders for the supply of 750 Braime's No. 8 steel sanitary buckets (May 27).

The Chairman of the Union Tender Board, Pretoria, invites tenders for the supply of beans, bread, coal, wood, lime, mealies, meal, fresh meat, paraffin, salt, soap (Colonial), mixed vegetables, potatoes, and general groceries to the Union Prisons Departments, the period commencing 1st July, 1912, and ending 31st March, 1913 (May 29).

The Chairman of Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for the drainage system at Laundry and Houses for Doctor and Secretary at the Boksburg Hospital (May 17); also for the erection of boarding-house, Girls' High School, Pretoria (June 7).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of Oilskin Capes and Mackintosh Overall Leggings to the Department of Posts and Telegraphs during the period 1st July, 1912, to 31st March, 1915. The approximate annual requirements are 500 black oilskin capes and 500 black mackintosh overall leggings (June 5)

The Chairman of the Tender Board, Provincial Secretary's Office, Bloemfontein, invites tenders for the erection of a bridge over the Valsch River at Bothaville (May 21); also for the erection of a bridge over the Leibenberg's Vlei River (May 28).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of leather to the Central Prison, Pretoria, and the Breakwater Reformatory, Capetown. (May 15).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of horse rations to the Urban Police (Cape Division), (May 15).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the erection of new public offices at Murraysburg; also for repairs to Residency at Murraysburg; also for repairs to public offices and residency, Richmond, and repairs to gaol at Richmond (May 22).

The Chairman of the Tender Board, Attorney-General's Office, Pietermaritzburg, invites tenders for the reconstruction of Gourton Bridge over the Little Tugela River, Estcourt-Bergville Road (May 20); also for erection of a bridge over the Amatikulu River, M'tunzini Division (May 27).

The Chairman of the Tender Board, Provincial Auditor's Office, Capetown, invites tenders for the reconstruction of bridge over the Knysna River. (May 13.)

The Municipal Council of Salisbury invites tenders for materials to be supplied and work to be executed in the construction of a reinforced concrete covered service reservoir, high level tank, etc. (May 22).

The Town Clerk of Clocolan, O.F.S., invites tenders for the erection and completion of a water scheme at Clocolan (May 31).

Rand Collieries.

The Directors' Report for the quarter ending March 31st, states: In January last, the following was published in the local and London Press for the information of shareholders:—"The financial depression having made it impossible to submit to shareholders a scheme for the capitalisation of the present debt of about £115,000, and the provision of further working capital, the board has decided to limit operations to the sinking of the east incline shaft. This shaft being a continuation of the No 1 vertical shaft, commences 2,790 feet below the surface and has already attained a depth on the incline of 652 feet. The General Mining and Finance Corporation has agreed to continue to advance, for the present, the necessary funds. The payable ore fully developed amounts to 261,947 milling tons of an average value of 7.46 dwts." At the end of last quarter (March 31, 1912), the east incline shaft above referred to had reached a depth of 1,028 feet.

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The Week's Company Meetings.

AURORA WEST UNITED.

Features of the Year.

Reorganisation Proposals.

The ordinary general meeting of shareholders of the Aurora West United Gold Mining Co., Ltd., was held last week in the board room, General Mining Buildings.

Chairman s Speech.

The Chairman, Sir George Albu, Bart., in moving the adoption of the reports and accounts, said: On this occasion the annual meeting of your company is being held later in the year than has hitherto been the custom, but I think you will agree that the delay in bringing you together is more than compensated for by the issue of the annual accounts and reports to shareholders some seven or eight weeks before the date of the meeting. This innovation (which applied to all the mines under the control of the General Mining and Finance Corporation, Ltd., has been under consideration by us for some time past, and we have now definitely decided to carry on the new practice in each future year also, with the view that shareholders both here and in Europe, before forwarding their proxies for the meeting, shall have ample time in which to digest the accounts and directors' report on the operations of the company for the previous financial year.

The Accounts.

In reviewing the accounts for the past year and comparing the results with those obtained for the previous twelve months, it will be observed that the profit on mining operations, together with sundry revenue, amounting to £30,466, is about £1,600 less than for the year ended 31st December, 1910. This is due entirely to the increase in working costs of approximately 7d. per ton as compared with the previous year, though some 3,000 additional tons were milled during the later period, and is attributed by your manager to the higher cost of native labour entailed by the increased competition for this class of workman. This contention is borne out by the charge to profit and loss account, under the head of "Mining," which shows a cost per ton milled of 9s. 6d., as against 8s. 9d. for the previous year. With reference to the statement of the financial position at the 31st of December last, as detailed in the report of your directors for the past year, you will observe that the excess of liabilities over liquid assets, amounting to £162,902, shows an increase of £5,669 on the figure for the previous year, notwithstanding the fact that a working profit of £30,466 was earned during the period, and it appears to me advisable that I should take this opportunity of explaining the matter for the benefit of those shareholders to whom the solution may not be quite clear. The profit for the year ended 31st December last amounted to £30,466, and to this must be added the sum of £5,669, representing the additional liabilities of the company at the latter date, making together a sum of £36,135 to be accounted for. As a matter of fact, this is represented by capital expenditure during the year on permanent works, plant and machinery, and excess devlopment, amounting together to £23,303 by the provision of £1.508 for profits tax paid to the Government and by interest amounting to £11,354 in respect of the indebtedness of your company to the General Mining and Finance Corporation, Ltd., for advances as shown in the balance sheet. The difference of £30 between the total of these three items and the amount of £36,135, to which I have previously referred, is represented by a small decrease in the book value of furniture, livestock and vehicles during the past year.

Ore Reserves.

The ore reserves at the close of the year under review, amounting to 345,578 milling tons, show a small increase of about 6,500 tons over the estimated reserves at the end of 1910, with no change in the average value. On the other hand, however, at the 31st of December last there were, in addition to the reserves which I have mentioned, some 69,000 milling tons of ore of an estimated value of 6.8 dwts., which have been temporarily taken to suspense, as, being only partially exposed, they cannot be included in the actual ore reserves for the present, though at a later date, when the necessary connections shall have been made. this extra tonnage will be available for stoping

Development.

I have practically nothing of special interest to report in connection with development operations beyond the fact that in the 11th level west, now being driven on the main reef leader, the last 150 feet gave an average assay value of 7 dwts. over 36 inches. This is an encouraging factor inasmuch as the upper levels on main reef leader in the western section of the mine have, as a rule, disclosed low grade values, and it, therefore, gives us reason to hope that the lower levels in the western section of the property on this ore body will give improved results.

Increase of Mill Plant.

At the previous annual meeting of your company I mentioned that your directors were then considering the advisability of erecting two tube mills and increasing the treatment capacity of the cyanide works with a view of raising the monthly production to approximately 14,000 tons. On going more thoroughly into the question, however, with our engineers, we found that the desired increase, so far as milling is concerned, could be obtained by the addition of twenty stamps to the existing mill, making 80 stamps in all, and that this installation could be effected at an appreciably lower capital cost than would attend the erection of tube mills, as the latter would also involve a considerable amount of regrading work on the property including the erection of a new tailings wheel. The General Milling and Finance Corporation, Ltd., agreed to advance such further sums as might be required to carry out the new construction work, and also for the overhauling and renovation of the pile blocks and other items in connection with the existing 60 stamps which was also found to be advisable, and in consequence orders were placed in July of last year for the additional plant and material required. In order to obviate the necessity for restricting the normal output (which would otherwise have been entailed), through the period required for the renovation of the mill, the work in connection with the installation of the additional 20 stamps was first put in hand, and after this was completed and the new stamps were running, the renovation of the pile blocks of the old mill was begun, the work being done in units of 20 stamps at a time so as not to interfere with regular production. Concurrently, the additional sands and slimes tanks were also installed. As forecasted in the directors' report before you, the renovation of the old 60 stamps was completed in the middle of last month, since which date the full battery of 80 stamps has been running. During the last two or three months we have also taken advantage of the more ample supply of natives coming forward to increase the native labour complement to an extent which is sufficient to maintain the augmented scope of mining and milling operations, provided, of course, that no severe wastage takes place during the next few months. As the majority of the new boys recruited for the mine are raw and inexperienced, it may not be possible for the next month or so to increase the tonnage milled to the full capacity of about 15,000 tons per month which the installation of the new and additional plant has rendered possible. I am hoping, however, that the maximum output will be reached very shortly and regularly maintained with a corresponding favourable effect on the hitherto normal standard of profits.

Reorganisation.

In view of the current market valuation of the shares of your company and the practical impossibility of obtaining subscription of new shares for the liquidation of the company's indebtedness on the existing basis, we considered the advisability of reducing the present capital of the company to a reasonable extent which would allow of the possibility, under improved conditions of the money market coupled with the larger scale of profits which it is reasonable to anticipate in the future, of liquidating the indebtedness of your company at the first favourable opportunity. An extraordinary general meeting has therefore been convened for the 18th May for the purpose of reducing the nominal value of the existing 212,705 shares from £1 to 10s. each, and to authorise the directors to create and issue a further 387,295 shares of 10s. each at such times and on such terms as they may deem fit for the purpose of providing funds with which to wipe out the company's present liabilities. I shall have the opportunity at this forthcoming extraordinary meeting to explain in greater detail the advantages of these proposals, and it is therefore unnecessary for me to dilate upon them at the present moment beyond stating that in my opinion the scheme provides the only practicable means for relieving your company of the incubus of debt at present overhanging it, and thus paving the way for reaching the desired position of distributing its annual profits in the form of dividends to shareholders.

In conclusion, I have much pleasure in recording the appreciation of your Board of the conscientious manner in which your manager., Mr. J. P. Ward, has performed his duties during the year under review.

The report and accounts were adopted.

The retiring directors, Sir George Albu and Mr. George Nathan, were re-elected.

Messrs. Henry Hains and J. Fraser were reappointed auditors.

CINDERELLA CONSOLIDATED

Labour Troubles.

Vigorous Development.

The ordinary general meeting of shareholders of the Cinderella Consolidated Gold Mine, Limited, was held on May 3rd, in the board-room, General Mining Buildings. Sir George Albu, Bart., presided, and there were also present Messrs. G. Imroth, J. L. Gauf, A. French, J. Munro, A. Rosendorff and H. W. Dalton.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: Though the work effected on your property during the year under review has been very considerable, as I shall illustrate later in my address, I can quite sympathise with the concluding remarks of the manager in his report for the period, where he states that the past year has been a most difficult one. By reason of there being—until the end of November last—only one outlet to the mine, we have, since the initiation of crushing operations some two and a half years ago, been working under great disabilities, as in terms of the provisions laid down by the Single Outlet Commission we were only allowed to place a limited number of workmen underground at any one time. Restrictions of such a nature would be prejudicial enough in the instance of a small mine, with a correspondingly limited crushing capacity and with no necessity, therefore, for accumulating a large tonnage of ore reserves; but in the instance of your company, with its huge mining area of over 2,100 claims, and the immediate desirability of progressing with all possible speed with the big scheme of underground development which has been evolved for the subsequent considerable expansion of mining and milling operations, the lack of unrestricted working powers, coupled with the dearth and inefficiency of native labour which was also experienced, was severely felt.

Second Outlet.

One of our great difficulties was to maintain the normal standard of milling operations as hitherto carried on, and at the same time, with a very limited labour force, to proceed with the opening up of the lower levels of the mine and the development of the new ground to the north and east of the original Cinderella Deep boundaries which had been acquired from the Government and the East Rand Proprietary Mines respectively—the former being so important because of the necessity which arose for obtaining a second outlet through the Cason shaft of the East Rand Proprietary Mines, and the latter being most desirable in view of the great objective of connecting up as soon as possible with the projected extension from the new central shaft now being sunk on the central portion of the consolidated area. And here I may refer to another difficulty which we experienced during the year. It will be remembered that at the time of our last annual meeting we were driving with all possible speed westwards on the 3,900 feet level, with the object of obtaining a second outlet through the Angelo Deep shaft of the East Rand Proprietary Mines, as agreed with the latter company, and it was confidently anticipated that we should effect the connection a few months later. You will appreciate our great surprise and keen sense of disappointment in June last when, with only approximately 200 feet still to be driven (a month's work at the outside), we received an intimation from the East Rand Proprietary Mines of their decision to shut down all work in the Angelo Deep section of their property, thus rendering their shaft useless as a second outlet for your mine, as the water would naturally rise on the suspension of work to a point above the horizon of the connecting level being driven by us. Our object of a second outlet from this source being thus rendered nugatory, and as we were threatened by the Single Outlet Commission with an order shutting down all mining operations on your property unless another outlet were provided within a very limited period, we commenced without loss of time the alternative plan of extending the 3,000 feet level westwards to effect a connection with the Cason shaft of the East Rand Proprietary Mines — a distance of 1,114 feet from the extreme point where the level had reached. This drive was so energetically proceeded with that we were able to establish the desired connection with the Cason shaft on the 30th of November, or five months after the commencement of the work, with the satisfactory result that all the restrictions placed on your property by the Single Outlet Commission have since been removed.

The Year's Progress.

At the commencement of my speech I stated that a very considerable volume of work had been effected on your mine during the year, notwithstanding the adverse factors with which we had to contend. Apart from the ordinary mining work necessary for the maintenance of milling operations, and to which I will refer in detail subsequently, a great amount of valuable progress was made in the direction of the big scheme laid down for the development of your property on lines commensurate with its large area. I have already mentioned the connection with the Cason shaft from the 3,000 feet level. The latter, which was opened up by means of a crosscut from the main shaft (the vertical shaft of the original Cinderella Deep), had to be connected with the lower workings of your mine, and for this purpose a considerable amount of raising and winzing was necessary, and was effected, but as this work obviates the necessity for the more expensive incline shaft which would otherwise have been required to serve the reef-bearing ground in the vicinity, it really constitutes a saving of a certain amount of capital expenditure. The drive from the 3,900 feet level towards the Angelo Deep shaft may yet serve a useful purpose, as I observe from the last quarterly report of the East Rand Proprietary Mines that the company has decided to de-water this shaft and resume development operations in that section of its property.

As regards further development work which we have accomplished, the main incline shaft has reached a depth of 1,019 feet, or equivalent to a vertical depth of 4,542 feet below the surface, and the 3rd, 4th and 5th levels, at 4,159 feet, 4,300 feet, and 4,450 feet respectively, have been driven into the 18.8 claims acquired from the East Rand Proprietary Mines a little over a year ago, and an intermediate incline shaft has been commenced from the 4th level, at a point 900 feet from the original Cinderella Deep eastern boundary, and 2,200 feet from the main incline shaft, which will facilitate development from the 6th and 7th levels, from which the main drives to connect up with the incline shaft to be sunk from the new central shaft will be made. Moreover, in the upper portion of the ground two new levels have been opened up at 3,250 feet and 3,450 feet respectively, in addition to the 3,620 feet, 3,750 feet, 3,900 feet (or 1st level), and 4,000 feet (or 2nd level), levels previously and still being driven on. All these levels are disclosing values up to the average grade of the mine as indicated by past results. There is also the work effected in respect of the new central seven-compartment shaft, which at the end of last month had reached a vertical depth of 1,900 feet, and in which the first pump station at 1,000 feet depth has been completed and powerful electric pumps installed, thus making for better sinking conditions; this shaft is expected to intersect the reef towards the latter part of the current year, and subsequently an incline shaft will be sunk on the horizon of the reef to meet the lower levels now being driven from the main incline shaft in the western (or Cinderella Deep) portion of the property. It would be difficult to over-estimate the importance of this shaft, as not only will it serve to develop the central section of your mining area, but in addition it will, after the connection has been made with the western section in the manner to which I have just referred, be a means of facilitating development and hoisting operations for the whole of the property under attack.

Ore Reserves.

The work summarised in the foregoing remarks is to a large extent of a permanent nature, specially devised to facilitate future conditions of mining and development, but it has also had the effect of appreciably augmenting the ore reserves, which at the close of the year under review were estimated by your manager to amount to 740,157 tons of "payable" ore of an average value of 6.73 dwts. per ton, exclusive of 191,451 tons of ore at present placed to "suspense," as until the completion of certain necessary connections in the blocks, no definite value can be assigned to them. These figures show an increase of 318,273 tons of "payable" and 148,055 tons "in suspense" over the reserves existing at the close of the previous year. Though the augmentation may be considered very satisfactory, it is not so great as we had previously anticipated, owing to the unforeseen delay in obtaining the second outlet, and also to the scarcity of native labour experienced during the period; but for these obstacles, I am confident that the payable ore reserves would have totalled up to a round million tons at the 31st of December last. I am pleased to be able to record, however, that in February and March we were able to obtain a considerable accession to our native labour complement, as a consequence of which it should now be practicable to increase the rate of development progress. During the first quarter of the current year the payable tonnage developed amounted to 141,000 tons of ore of an average value quite up to the standard of the mine, as against 48,967 tons mined and hoisted in the same period; this was accomplished before the real effect of the additional labour supply could be felt, and, given a maintenance of the improved labour position, I am assured by your manager that development work during the remainder of the year will be expedited to a still further degree, with the result that he anticipates that at least 750,000 tons will have been added to the ore reserves for this year, after allowing for the ore milled during the same period; in other words, that the reserves at the 31st of December next should amount to not less than 1,500,000 tons of payable ore.

Costs and Profits.

Turning now to the mining and milling operations for the past year, the shortage and general inefficency of native labour formed a very prejudicial factor against our obtaining the results which would have been shown under normal conditions. The yield of 27s. 6d. per ton is, under the circumstances, a fair reflection of what we consider the average grade of the mine, but the high level of working costs, which averaged close on 24s. per ton milled, is a practical demonstration of the great difficulties which had to be contended with and to which I have previously referred. I would again remind shareholders of the fact to which I alluded at the last annual meeting of the company, that, owing to the large area of the property, the standing charges, which have to be met, irrespective of the quantity of ore crushed, are very high on the comparatively small scale of milling operations which was possible during the past year, and that, per contra, they will be a decreasing charge per ton as the scale of operations increases. The working profit of 3s. 7d. per ton for 1911 is consequently no criterion of the capabilities of your mine when working on an adequate scale such as is contemplated in the course of the next few years. As regards the milling policy in the immediate future, the capacity of the present reduction plant is now placed by our engineers at about 22.000 tons per month. The average tonnage crushed last year was equal to about 16.000 tons per month which was all we were able to do with the scanty labour force at our disposal. This position was even worse in January and February of this year, but I am glad to say that in March the additional natives obtained enabled us to crush 17.280 tons for a working profit of £5.027, and that for last month we milled 18.000 tons, with a profit of £6.000; the tonnage should be still further increased to 20.000 in May, and as the efficiency of the new boys is improving, we hope to be able to crush up to the full capacity of the mill, i.e., 22.000 tons per month, within a very short time.

The Future.

Whether we shall add to the present mill at the end of this year, with the view of increasing its capacity, is a matter which your Board is at present carefully considering, but on which no definite decision has yet been arrived at. And there is no immediate hurry for such decision; the main point at present is to open up the mine as energetically as possible and to add largely to the volume of the ore reserves, and I can assure you that if, as we have every reason to hope, the ore developed by the work now in hand continues to give the average value of the mine as opened up today, and the same percentage of payability, there will be neither hesitation nor difficulty in augmenting the reduction works to a capacity fully in keeping with the size of your property. I am particularly anxious that shareholders should not be led away by the artificial fall in the market value of the shares of this company which has taken place during the depression of the last two years, and that they should not judge the capabilities of the property by the comparatively meagre profits at present being earned from milling operations, but that they should, with good reason, attach more importance to the preparations which are being steadily made for practically demonstrating the undoubted value of the ore contents of the mine when working on an extensive scale. I would ask you to bear in mind that it is only a little more than two years ago since the transformation of your property from a mynpacht of 289 claims to a mining area of over 2.100 claims, and that the many miles of driving, crosscuts, connections, and shaft sinking to and at a depth varying from 3.000 to over 4.500 feet below the surface, which are necessary to develop such a huge property to a stage when milling operations commensurate with its size can be inaugurated, must inevitably take time to accomplish. As to the question of funds, it will be seen from the directors' report that the surplus liquid assets at the 31st December last amounted to £343.057. In view of the additional information gained by our development work during the past two years, I have no hesitation in recording my earnest belief that the prospects of your company are at least as favourable to-day as was stated at the time when we effected the consolidation of your property, and that, given fair conditions of labour, we shall make it an essentially prosperous concern. And I may say I am hopeful that, as a result of recent conferences between the mining groups on these fields, a reasonable and sensible arrangement may be arrived at in the near future which will have the effect of reducing the cost of our native labour without impairing its efficiency or the normal volume of its supply. I have much pleasure in recording the appreciation of your Board of the untiring energy and cheerfulness with which your manager, Mr. F. W. Girdler-Brown, has carried out his duties in face of the abnormal difficulties which had to be encountered during the past year. In fact, I should like to take this opportunity of referring in the most cordial manner to the whole-hearted devotion which Mr. Girdler-Brown has given to the interests of your company during the whole of the many years of his service as manager. On this occasion the annual meeting of your company is being held later in the year than has hitherto been the custom, but I think you will agree that the delay in bringing you together is more than compensated for by the issue of the annual accounts and reports to shareholders some seven or eight weeks before the date of the meeting. This innovation (which applies to all the mines under the control of the General Mining and Finance Corporation, Ltd.), has been under consideraton by us for some time past, and we have now definitely decided to carry on the new practice in each future year also, with the view that shareholders, both here and in Europe, before forwarding their proxies for the meeting, shall have ample time in which to digest the accounts and the directors' report on the operations of the company for the previous financial year.

The report and accounts were adopted.

Sir George Albu and Mr. J. Freudenthal were re-elected directors.

The auditor, Mr. Thomas Douglas, was reappointed.

NEW STEYN ESTATE.

Start Delayed.

Excellent Prospects.

The ordinary general meeting of shareholders of the New Steyn Estate Gold Mines, Limited, was held on May 3rd, in the board-room, General Mining Buildings, Sir George Albu presiding.

The Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: When reviewing the affairs of your company at the previous annual meeting in March, 1911, I pointed out that the general conditions of the South African market had not been favourable to the provision of the large additional funds required for the shaft sinking, development, and equipment of your property, in order to bring it to the producing stage, but as I still hoped that there might be a recrudescence of public interest in gold mining shares in the immediate future, I stated that we were considering the question of ordering the necessary sinking engines and other surface plant for commencing shaft sinking on th enorthern portion of your mining area, so that we should be in a position at once to begin active operations if the further working capital were likely to be provided. In view, however, of the general depression which has prevailed since I last addressed you, we were obliged to abandon for the time being any idea of embarking on a scheme having for its object the initiation of mining work, which must inevitably exhaust the company's existing funds long before any material result could accrue of a nature which would demonstrate the value of your property to any practical degree.

Policy of Conservation.

The very large extent of your main reef mining area of 1,920 claims, and its deep-level character, necessitate the provision of a considerable amount of working capital in order to cover the expenditure on shaft sinking, and the subsequent development of the mine on an adequate scale, and until we can see our way to provide this capital, it is the wiser course to conserve the company's existing funds. I may say that I am still as confident as ever that we possess a property of exceptional potential value, and that it may be regarded as one of the plums of the main reef propositions on these fields which still remain virgin ground. The south reef is a particularly rich ore body in the Roodepoort District, and, as I have pointed out on previous occasions, the old established Roodepoort mines working above have for very many years past prove the profitable character of this reef in a most practical manner. It is as certain as it can be without actual demonstration, that your property contains the extension of the payable reef conditions found in the upper ground, and with the huge length on strike of your claims and the easier development conditions thereby rendered practicable, mining operations should be essentially successful when conducted, as they would be in this case, on a very large scale, even if we decided to confine our work entirely to the south reef to the exclusion of the bigger but more patchy main reef ore body. For the present, however, we are obliged to continue a waiting policy, until such time as more favourable conditions arise for financing your company on a permanent basis. And I may perhaps here remind you that the present issued capital of your company of £300,000 is quite a small one in comparison with the very large area of reef-bearing ground held, and in view also of the fact that the cash and other liquid assets in hand amounted to £89,308 at the 31st of December last.

Financial Statements.

Dealing with the balance sheet at the 31st of December last, I may explain that the addition of £3,068 under the heading of property account represents the purchase price of certain claims which, though included in the claims on Vogelstruisfontein referred to in the directors' report for 1910 as having been acquired, were only actually transferred during the past year. Investments show an increase of £867 over the figure in the previous balance sheet, owing to the purchase of a further parcel of shares in one of the deep level companies in the vicinity of your property, in which, as I informed you at the last annual meeting, we have acquired a large holding. As regards the profit and loss account, the increase in expenditure from £9,464 for the year 1910 to £9,727 for the year under review, is fully accounted for by the additional claim licences, amounting to £885, paid during the latter period. A comparison of the revenue for the two years in question shows that the past year's income only amounted to £5,840, as again £54,933 in 1910; it must be remembered, however, that the last mentioned figure included the profit of £47,481, resulting from the sale of the company's investments, and a higher amount received for interest owing to the fact that the cash funds in the possession of the company for the greater portion of the year 1910 were appreciably larger than during the past year.

On this occasion the annual meeting of your company is being held later in the year than has hitherto been the custom, but I think you will agree that the delay in bringing you together is more than compensated for by the issue of the annual accounts and reports to shareholders some seven or eight weeks before the date of the meeting. This innovation—which applies to all the mines under the control of the General Mining and Finance Corporation, Ltd.—has been under consideration by us for some time past, and we have now definitely decided to carry on the new practice in each future year also, with the view that shareholders, both here and in Europe, before forwarding their proxies for the meeting, shall have ample time in which to digest the accounts and the directors' report on the operations of the company for the previous financial year.

The report and accounts were adopted.

RAND COLLIERIES, LTD.

A Waiting Policy.

More Capital Required.

The ordinary general meeting of shareholders of the Rand Collieries, Limited, was held on May 3rd, in the board-room, General Mining Buildings, Sir George Albu presiding.

The Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: At the previous annual meeting I stated it was very unlikely that the remaining option to guarantors, to take up 63,125 shares of your company at 50s. per share, would be exercised before the 30th of June last, at which date the right would expire, but that the General Mining and Finance Corporation, Ltd., had agreed to advance to your company, until further notice, the funds required to continue operations. You will have observed from the directors' report and the accounts that the option in question was not exercised, and that your company was, at the close of the year under review, indebted to the General Mining and Finance Corporation to the extent of £108,096 for moneys advanced by the latter during the year. In view of the prevailing depression in money market conditions, it was quite impracticable to formulate a scheme for the capitalisation of the loan on satisfactory terms, which would be likely to meet with adequate response from shareholders, and as there appeared to be no immediate likelihood of a marked improvement in these market conditions, and with the view also of keeping the indebtedness of the company within reasonable limits, we decided in the early part of this year to considerably restrict the scope of development operations.

East Incline Shaft.

We deliberated the question as to the particular work to be undertaken for the purpose of giving us the greatest measure of value for the reduced scale of expenditure agreed on, and, in view of the importance of gaining some information as to the trend of the reef and its conditions in the lower (or eastern) section of the property, it was decided to continue the east incline shaft towards the eastern boundary. This shaft, which commences at the foot of No. 1 vertical shaft, was laid out for the purpose of serving the ground below the 7th level on the northern section of the property, and the distance from its starting point to the eastern boundary of the mine is approximately 3,800 feet, of which, up to the present date, 1,130 feet have been sunk on incline. The extension of the incline (which has been equipped with a 2-ton electric hoist) will also serve a valuable purpose at a later date, when active mining operations shall have again been rendered practicable by the provision of further funds, as it will provide facilities for rapid development by opening up new levels at proper intervals along the additional distance now being and still to be sunk. The position at present attained in the shaft is about 190 feet below the point at which the 9th level will be laid out at a later date. As regards the funds required for the prosecution of the work now being carried out, the General Mining and Finance Corporation has agreed to advance these moneys for the present.

Development Operations.

The report of the manager for the past year deals fully with the operations for that period, and I therefore only touch on the main points arising therefrom. The total development footage effected in driving, rising, crosscutting, shaft sinking, etc., amounted to 12,447½ feet, as compared with 9,030½ feet for the previous year, thus fulfilling my statement at the last annual meeting that the scope of development work would be materially increased. A considerable extent of driving was done on the respective levels opened up, with variable results as regards values. The 5th level drives gave poor values as a whole: the 6th level north, out of 820 feet sampled, disclosed 430 feet (or 52 per cent.) of an average value of 5.6 dwts. over 36 inches; and in the south drive, of 915 feet sampled, 605 feet (or 66 per cent.) averaged 7.8 dwts. over 36 inches. The seventh intermediate level north showed poor values, while on the north drive 825 feet were sampled, of which 335 feet (or 40 per cent.) gave an average of 5.6 dwts. over 36 inches. In the 7th main level, the last 55 feet on the north drive towards the northern boundary disclosed the very satisfactory average value of 11.5 dwts. over a width of about 40 inches. The lowest level so far opened up in the property, No. 8, averaged 6.2 dwts. over 30 inches for 47 per cent. of the 380 feet driven on reef in the north drive, and 5 dwts. over 39 inches for 275 feet (or 43 per cent.) of the 630 feet sampled in the south drive.

Financial Handicap.

The foregoing values serve to show that a very substantial percentage of the work effected during the year resulted in developing payable ore, and yet I feel fairly confident that we have so far been exploring the poorer zones of the mine, and that further development operations on an extended scale would result in disclosing a higher grade reef with a larger percentage of payability. It is for this reason that I regret the necessity, which the financial position of your compnsy has forced us into, of curtailing operations. The estimated payable ore reserves of 374,200 mining tons of an average value of 5.37 dwts. per ton over 42 inches (which it is calculated would, after full allowance for sorting, represent 261,947 milling tons of a value of 7.46 dwts. per ton), constitute a distinct encouragement for the further exploitation of the property. If you take into consideration the fact that we have spent over £660,000 in the equipment and development of the mine, that we have a splendid surface plant, including new steel headgears, electric hoisting and electric pumping plant of the most efficient design, and that the two vertical shafts serving the full width of the property are sunk to the reef and connected underground, and a very considerable amount of development already effected, it seems anomalous that the progress of the company should be impeded because of the inabiltiy to raise sufficient funds to proceed with the opening up of the property and the erection of a reduction plant. I trust that the market conditions will in the near future so improve as to allow of the capitalisation of the company's indebtedness and the provision of the additional money required for the resumption of mining operations on an adequate scale.

On this occasion the annual meeting of your company is being held later in the year than has hitherto been the custom, but I think you will agree that the delay in bringing you together is more than compensated for by the issue of the annual accounts and reports to shareholders some seven or eight weeks before the date of the meeting. This innovation—which applies to all the mines under the control of the General Mining and Finance Corporation, Ltd.—has been under consideration by us for some time past, and we have now definitely decided to carry on the new practice in each future year also, with the view that shareholders, both here and in Europe, before forwarding their proxies for the meeting, shall have ample time in which to digest the accounts and the directors' report on the operations of the company for the previous financial year.

The report and accounts were adopted.

Messrs. Leopold Albu and Arthur French were re-elected directors.

Mr. James Fraser was again appointed auditor.

TWEEFONTEIN COLLIERY.

Annual Meeting.

The fifth ordinary general meeting of the Tweefontein Colliery, Ltd., was held at Egypt House, 36, New Broad Street, London, E.C., on the 12th of April, Lord Oranmore and Browne presiding.

The Chairman's Speech.

The Chairman, in moving the adoption of the report, said: Our capital account remains as in the last balance sheet, and the amount of debentures in issue is also the same, the repayment contemplated not yet having been carried out. The chief reason for deferring this is in order that provision may be made at the same time for any fresh capital expenditure which the contract with the Transvaal Hydraulic Power Syndicate may impose on us, and it is not possible yet accurate to forecast this. Last year you will remember that our accounts showed that the advances we had obtained for fresh capital expenditure stood at £14,687. In the accounts for this year this item has entirely disappeared, as it has been paid off out of cash in hand. This will enable us to face with equanimity such further capital expenditure in connection with the chemical and power companies as may be necessary. The additional capital expenditure during the year amounted to £2,071. Turning to the profit and loss account, you will observe that the total profit on coal winning amounts to £24,563, and that there is a small additional income bringing the total on the credit side of this year's profit and loss account up to £25,018. Depreciation, on what we consider a full scale, absorbs £7,816, and London expenditure and debenture interest, etc., £7,456; while we have written off one-half of the balance of the preliminary expenses, so that in future that account will not be a heavy annual burden on our profit. To the balance of £8,182 there falls to be added the £2,087 brought forward from last year, making a total of £10,269. This would have enabled us to propose to you the paymenut of a higher rate of dividend than we now suggest, but we think it better to proceed cautiously, and that the recommendation we now make of limiting the dividend to 12½ per cent. is the more prudent course, enabling us, as it will, to increase the carry-forward this year to £4,538 18s. 11d.

Coal Sold.

You will observe that the coal sold was 277,777 tons, showing a shrinkage of 8,852 tons on the sales of the previous year. During six months of the previous year we were selling coal ourselves, and not through the combine of colliery owners, and it is satisfactory to see that under the combined arrangement our sales have been maintained at practically the same figures, notwithstanding the lower output we agreed should be allotted to us. I have previously explained to you the advantages we gain from our membership of the combine, and while it is possible that we should have disposed of a larger tonnage by continuing to sell our output ourselves, it is satisfactory to be able to record an increased profit on that of the previous year from the course we adopted. As to the condition of the mine and the plant, the manager's report speak for itself. The thanks and congratulations of the shareholders are due to Mr. Simon and to our representatives in Johannesburg for their conduct of the year's operations. We have every reason to believe that we shall be able at least to maintain our position during the current year pending the completion of the scheme for the erection of chemical works and a power station, which will, of course, very much widen the scope of the company's trade.

Effects of British Strike.

The coal strike in this country, greatly as we all here regret it, has evidently had a beneficial effect on the export and bunkering trade of Transvaal coal at Delagoa Bay. What that effect has been exactly we have not yet the details, but we have some evidence of it in the output sold from the collery during last month, which was almost a record—29,533 tons. This has only once been exceeded, namely, in June, 1910, when 33,030 tons were sold. It may be that this is only a temporary effect, but it emphasises the importance of this particular class of the trade to us and to the coal industry of the Transvaal and your board trust that when the much-talked-of reduction in railway rates in the Transvaal takes place, this position will be recognised, and the Transvaal will then be enabled to command a large share of the Eastern export trade, which I am informed can readily be obtained, given a comparatively small readjustment of the railway rates. Certain modifications have been made in our contract with the Transvaal Hydraulic Power Syndicate but the value of it to this company is unimpaired, and the arrangements for the carrying out of part of the scheme are now well in hand. Henderson's Transvaal Estates, Limited, is taking part in these arrangements, and in this way is fostering the interests and development of your company's business. In connection with this scheme our manager estimates that there is already actually developed a reserve of coal of the class to be supplied under our contract with the Transvaal Hydraulic Power Syndicate equal to 1,874.952 tons—and this only in the main seam in that small part of the area from which our marketable coal has been taken, in extent 184 acres out of a total of over 2,500 acres. In the course of the year we have taken advantage of the sinking of another downcast shaft for air purposes, to drive on the top seam which lies about forty feet above the main seam, in order to test the quality of the coal there, and it is satisfactory to know that it is such as to constitute this upper seam an additional reserve against a very great increase in the supplies we might be called on to give to the Power and Chemical Companies. You will remember that in addition to this we have a third seam which was located at a depth of thirteen feet below the main seam, having a width of approximately five feet, and in quality equal to our main seam.

Mr. W. Bryson Butler seconded the resolution, which was carried unanimously.

ROBERTS VICTORS.

The Position To-day.

Exploratory Work to be Continued.

The sixth general meeting of shareholders in the Roberts Victor Diamonds, Limited, was held on May 8 in Exploration Buildings, Mr. Charles W. Villiers presding. There were present Messrs. G. D. Massey, A. C. Mallinson, J. Emrys Evans, H. F. Watson, A. P. Lloyd, S. Marcus, M. Dold, and Smit, representing 49,503 shares out of an issue of 150,000.

Chairman's Speech.

The Chairman said: The directors' report and accounts, together with the reports of the manager and consulting engineer, give full information of the year's work and the position of the company. As you are aware, the meeting this year has been called at a later date than usual in order to afford shareholders in Europe a better opportunity of studying the reports and accounts. The accounts submitted to-day cover the period ended the 31st of December, 1911, and I am pleased to say that the financial position of the company has much improved since the accounts in front of you were made up. At the 31st of December, the company owed £30,715; while to-day this loan has been reduced to below £9,000, and there is every reason to suppose that the debt will be entirely paid off in about three months. The working revenue and expenditure account showed a loss for the year of £12,588 4s. 9d., which amount was carried to appropriation account, and was written off against the credit balance of £15,904 0s. 5d., brought forward at the end of last year, and the inclusion of British income tax for the period of five years ended 1910-1911, which your company has had to pay during the past year, amounting to £15,933 12s. 4d., converted the credit balance brought forward last year into a debit balance of £12,617 16s. 8d. No depreciation has been written off machinery and plant, which stands at a very low figure, namely, £9,579 12s. 5d.

Position at the Mine.

On turning now to the position at the mine, I would refer you to the consulting engineer's and manager's reports, which give full details of the work done up to the end of the financial year. Since that date the remainder of the blue ground on the dump has been treated, together with yellow ground from the No. 1 and No. 2 areas, making a total of 81,411 loads washed, from which 28,114 carats have been recovered, equal to 34.54 carats per 100 loads. The consulting engineer in his report stated that there was every reason to suppose that the No. 1 and No. 2 areas would prove to connect with one another, and this is proving to be the case. There is now only about 400 feet between the two areas, and in the course of about three months they should be connected. Assuming that the width of the fissure is maintained and it is found economical to work down to a depth of 150 feet, we shall have about 300,000 loads to wash which, on the present basis of washing, will keep the plant running for about fifteen months. I do not wish shareholders to think that the number of loads mentioned as still to be washed, necessarily means that on completion of the treatment of this ground the mine will come to the end of its tether: on the contrary, we still have in our area a considerable amount of ground through which we have every right to hope the fissure continues, and from which we may get a large quantity of ground.

Exploratory Work.

It is our intention to start exploratory work in this ground at an early date. In addition to the foregoing there is no reason why we should not find a body of blue ground below the new areas which will prove as rich as any ground in the old mine. Exploratory work done at the 314ft. and 394ft. levels was not very encouraging, but it would be unreasonable to condemn the whole of the ground on this account, as we have to remember that in the old mine it was only a limited portion which proved so rich, and this may again be the case in the new areas. Your late manager, Mr. Leyson, resigned his position in March, 1911, and was succeeded by Mr. E. Parsley. Mr. Parsley has had life-long experience in diamond mining, and I think his efforts and the efforts of the whole of the staff during the past year deserve the thanks of the shareholders. I have much pleasure in moving the adoption of the directors' report and audited statements of account for the year ended the 31st of December, 1911, as submitted to this meeting.

Claims and Working Costs.

Mr. Smit said last year the chairman informed shareholders that the new area then actually proved was fifty-nine claims. Reference to the consulting engineer's report showed only 23.3 claims. What had become of the difference?

The Chairman said those were claims which from indications at the surface were estimated to make fifty-nine. There would be twenty-five claims at the present time.

Everything, said the Chairman, in reply to other questions, was included in the expenditure indicated. A very good idea of working costs could be gathered from the fact that the debt had been reduced by nearly £22,000 in a few months. Working costs were about five shillings per load.

The report and accounts were adopted.

The appointment as director of Mr. C. F. Rowsell, in place of Mr. G. A. Hay (life director), resigned, was confirmed.

The Chairman expressed the regret of the board and the shareholders at the resignation of Mr. George Hay, who, he said, was a life member of the company, and had worked very hard for it. For reasons of his own he had seen reason to leave the board.

Messrs. J. Emrys Evans and Isaac Lewis were re-elected directors.

Messrs. H. J. Macrae and C. J. Watson were reappointed auditors.

Our Twenty-First Anniversary Number.

THE LAST WORD ON RAND MINING.

To commemorate the twenty-first anniversary of the founding of this journal, a special number, distinct from the ordinary weekly issue, will be issued in June next. Fittingly to mark the occasion, the number will contain a comprehensive and concise account of the past history, achievements and present position of every gold mine on the Rand, illustrated and brought down to the latest possible date. It will review the industry generally as well as in its several technical aspects, and will include articles by experts on the chemical, mining and metallurgical progress and problems of the fields. A feature will be made of the personal side of the industry, and a section will be devoted to its technical and administrative leaders, enriched with portraits and other illustrations. Engineering on the Rand in all its phases, electricity, steam and air power will be treated, and the growth and progress of electric power supply will be exhaustively discussed. The gold mines of the outside districts and the tin, copper and coal industries of those districts will be dealt with thoroughly and at first hand. The great diamond industry of South Africa will have a section to itself, and here, as in the treatment of the base metal industries, the letterpress will be embellished with many striking and original illustrations. Mining in the Cape, Natal and Orange Free State Provinces will also be reviewed and the undoubtedly great mineral potentialities of those, as yet undeveloped, areas will be graphically set forth. German South-West Africa will find a place in the issue and a first-hand account of the diamonds, the copper and the tin mines of that promising field will be included. Moreover, the banks and other great financial institutions, the railways and harbours of the sub-continent will be adequately dealt with, and the whole problem of transportation as it affects the inland industrial centres will be reviewed. In this connection Capetown, Port Elizabeth, Durban, East London, Delagoa Bay and Beira will be separately and fully treated and their claims examined. Apart from mining, there will be a considerable section devoted to a description of the several subsidiary industries dependent on mining for a market. Chief among these will be cement, explosives, soap and candle-making, milling and the hundred and one activities that centre in the Rand. Rhodesia and Mozambique will be given a separate and extended treatment. The different mines will be described and illustrated, and the recent progress of the industry in those territories dealt with comprehensively and lucidly. In addition, the issue will contain a number of interesting and valuable contributions from leading men in the mining and financial world, many of whom have already sent their congratulations on the decision to issue a special commemorative number of the journal. Numerous letters received from past Rand engineers and mine managers, now resident in all parts of the world, contain offer of contributions. These will form a unique collection of valuable views and reminiscences, and will considerably enhance the interest of the volume. The work will consist of upwards of 350 pages, printed throughout on art paper. Prizes are offered to artists for the best design of a suitable and striking character, and particulars are given in another part of this issue of other valuable prizes to be awarded in connection with the number. It may be added that the work will be prepared, produced and printed in South Africa, and will aim to cover the whole field of mining in this country, and to prove a fitting monument to the great industry with which, from the beginning, the *South African Mining Journal* has been associated. The co-operation of everyone interested in the industry is being enlisted to make the venture a success, and already it promises to mark an advance on anything of its kind ever before attempted in South African illustrated journalism.

New Patents.

159. Arthur Reginald Angus.—Improvements in or relating to railway safe running devices, " E.E."
160. John Frederick van der Velde.—Improved cradle for rock-drill machines.
161. Charles William Dowsett.—Improvements in regulating the outflow from pulp settling or classifying apparatus.
162. Tom Hurst.—Improved electric lamp holder.
163. Willis Herbert Post.—Beverage extracts.
164. Herbert Bullock.—Improvements in or connected with regulating or controlling devices applicable among other purposes for controlling dampers for furnaces.
165. Oscar Birger Carlson.—Improvements in the method of manufacturing combustibles for explosives.
116. Ernst Ritter.—Improvements relating to the construction of hollow beams and the like.
167. Paul Eugene Charles Corbin.—Improved manufacture of explosives.
168. J. Stone and Co., Ltd., and Alfred Henry Darker.—Improvements in suspension devices for dynamo electric machines.
169. Fred James.—Improvements in connection with loose leaf ledgers and like binding appliances.
170. T. P. Jordeson and Co., and August Marius Kjaersgaard.—A refrigerating machine combined with an ice cupboard.
171. William Ross and Arthur Morell Mackenzie Cooke.—Improved slimes or water overflow gate or decanter for tanks.
172. James Arthur Hart, Frederick Arthur Dudley and Harris Moseley.—Improvements in and in connection with devices for burning paraffin wax or the like for illuminating or other purposes.
173. William Birtley Craggs.—Improvements in or relating to axle boxes of trucks.
174. Abraham Isaac Wiesholtz and Morris Samuel Sachs.—Improvements in the manufacture of steel trunks.
175. Herbert Frankenstein.—An improved hollow concrete block machine.
176. John Chisholm.—Improvements in water beaters or geysers.

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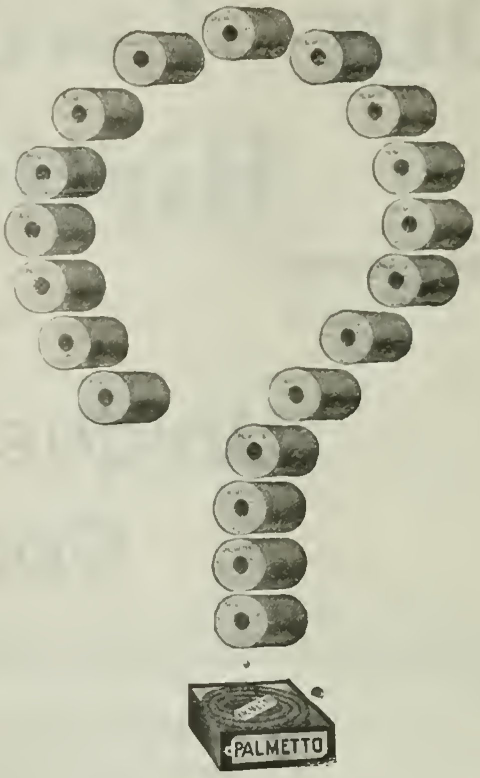

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Notes and News.

The Misfortunes of Diamond Diggers.

Judging from the numbers of men to be seen on the road between Bloemhof and Johannesburg, the new alluvial diamond fields which attracted such a large number of diggers a few months ago have proved quite the reverse of a Golconda—to a very large number, at any rate. Farmers along the line from Bloemhof to the Rand are receiving continual calls from unfortunates who are trudging back to the Reef with a view to finding work of some nature. The majority of these men are absolutely destitute and crave the charity of farmers and others along the line of their weary march. They appear to be a very respectable lot of men, and in most instances are fully deserving of sympathy. What measure of success is attending those who have been attracted to the new field near the township of Bloemhof, known as the "Racecourse Run," we cannot say, but judging from the exodus to the Rand, it does not appear that the discovery is of any great importance.

* * * *

Three Months at the New Primrose.

Amongst the older mines of the Witwatersrand which have preserved an even tenour during all the fluctuation and change of the past few years, the New Primrose calls for some special remark. This property has for long proved one of the mainstays of the Barnato group, and we note with satisfaction that during the last quarter the company earned the very satisfactory profit of £51,045. Capital expenditure only amounted to £129; whilst the ore reserves were depleted to a small degree. A satisfactory feature of recent development has been the opening up of payable stretches of Main Reef. During the three months 69,200 tons were milled for a recovery of 22,403 ozs, or 6·474 dwts. per ton.

* * * *

Uncommon Elements in Rand Banket.

The paper read by Mr. C. Baring Horwood at the last meeting of the Geological Society on the occurrence of iridosmine at the New Rietfontein mines was interesting, if only because it touched on a little-considered aspect of the Witwatersrand gold fields, namely, the occurrence of substances other than silica, iron pyrites and gold—the three staple constituents in the conglomerate. The Du Preez series evidently contains minerals of great rarity and complexity. Reference has on several occasions been made to the curious carbonaceous specks in the New Rietfontein, and it is of particular mineralogical interest to observe that the iridosmine occurs mostly in the well-known "Carbon Leader." It is not generally known that various very unexpected compounds are at times detected in Rand mines. Generally such compounds are found in very minute quantities, but not always so. For instance, the existence of marsh gas in the Simmer Deep mine, to which reference was made in the columns of this journal some little while ago, was sufficient to cause considerable anxiety to the management. It would seem, in fact, that just as there is a great deal to be learned about the geology of the auriferous conglomerates, there also remains much to be understood regarding the purely mineralogical aspect of the Main Reef series.

* * * *

West Rand Unified.

The twenty-stamp mill on the Penwith block of the West Rand Unified ground has almost reached completion. Preparations are being made to give it a trial run at an early date. What are known as the Penwith series of reefs are being opened up as vigorously as possible. They comprise six reefs within a distance of about 90 feet, the footwall of the series being slate. The whole dips rather steeply westwards, as a result of overtilting. The dip will naturally revert to the normal easterly direction sooner or later in depth, but the probability is that the reefs will remain within easy cross-cutting distance of a mean vertical plane for a considerable distance below the surface. Pannings of some of the reefs recently opened in a trench several hundred yards along the strike from the Penwith shaft, where some of them have been intersected at 100 feet, are quite satisfactory. It is maintained by some that the series is really a continuation of the Botha series to the south-west of the West Rand Central. If the bodies carry pay values to the degree anticipated the working of them will be much facilitated by the steep dip, convenient spacing and compact grouping of the individual ore bodies.

* * * *

"Something of a Dream."

It is noteworthy that the *S.A. News* is now persuaded that the hope of seeing a diamond-cutting industry established in South Africa, the realisation of which, it tells us, all looked forward to, has been "something of a dream": that the Government is amply justified in its hesitation to embark on any such hazardous project, and that "action on the facts at present before it would probably prove disastrous, not only to the new industry sought to be set up, but to the diamond mining industry in South Africa as well."

* * * *

The New Reet on the Pickstone.

The new reef on the Pickstone No. 1 East Extension Mine, in the Hartley district, is stated to be opening up very well. A trial crushing of development ore was made in March, and gave an average recovery of 100s. 3d. per ton. Another trial crushing was carried out in April, and a Rhodesian correspondent, in the course of a letter received a few days ago, advised that the clean-up from this promised to give an even better yield.

* * * *

Victoria Falls and Transvaal Power Co.

Elsewhere we give a description of one of the central compressed air power stations of the Rand Mines Power Supply Co., Ltd. At an extraordinary general meeting of the Victoria Falls Company, held recently in London, the Marquess of Winchester said that the shareholders had been invited there to sanction an increase in the borrowing powers of the company by £2,000,000 in excess of the present amount of £3,000,000, which had been already issued, and the greater part of the proceeds of which was represented by plant upon the Witwatersrand already in commission. The balance was required for plant now under construction. They had already the Simmer Pan and the Brakpan stations for supplying Victoria Falls consumers, and the Rosherville and Robinson central stations for the supply to Rand mines power consumers all working at their full capacity. By August next the Vereeniging station should be in operation to the extent of 50 per cent. of its proper capacity, and the balance should be in commission by the commencement of 1913. The demands of their customers, under long term contracts, far exceeded the capacity of their present stations, including the Vereeniging. It was proposed to ask the shareholders to consent to the increase of the borrowing powers by £2,000,000 by the creation of £2,000,000 5½ per cent. second debentures, but it was only proposed at present to issue £1,000,000. Arrangements for the issue would be made with certain strong financial groups. The provision of these further financial resources would add to the strength of the undertaking, and the directors were confident that it would improve the position of the holders of the preferred and ordinary stock. He moved the following resolution: "That the directors be and they are hereby authorised, in addition to the £3,000,000 already borrowed for the purposes of the company, to borrow amounts not exceeding in the aggregate £2,000,000, and to secure the repayment of the sum or sums so borrowed in such manner and upon such terms and conditions in all respects as they think fit." Mr. A. Brakhan seconded the resolution, and it was carried unanimously without question or remark on the part of shareholders present.

Transvaal Estates and Development.

The Transvaal Estates and Development Co., Ltd., owns 1,883,646 acres of land, which cost it an average of 6s. 3d. an acre. Upwards of £164,000 have been spent on the recovery, upkeep, and improvement of these estates, which, in the fifteen months to December 31, 1911, produced rentals amounting to £12,653. Investments stand in the books at £334,472, and the yield from interest and dividends in the same period was £20,194. The company also made a profit of £5,915 by sales of investments. After payment of all expenses and writing off £13,667 against depreciation of investments and possible losses, a balance of £7,300 is added to the amount at credit of the income and expenditure account, which now stands at £83,059. The investments had, at December 31, a market value of £348,709, equal to over 7s. per share on the issued capital of 985,630 shares. The company is thus in a very strong financial position, and is in possession of an enormous estate of improving value. It may be objected that the progress is slow, but that is the way with land companies. Progress is hardly visible for a long time, and then a sudden boom lifts the shares so as to represent all the value which has been piled up by the patient work of years. The directors, in their report, say that "the outstanding feature in South Africa during the past twelve months has been a remarkable advance in the value of land—but only of improved land—and a period of considerable activity in this direction is probably impending."

* * * *

Goerz and Co.'s Latest Results.

Labour and other troubles, with the suspension of operations at the Van Dyk, pending the advent of times more favourable to the consideration of proposals for raising further capital, cause increased depreciation in the shareholdings disclosed in the latest report of A. Goerz and Co., Limited. The accounts for 1911 exhibit a profit, before providing for writings-off in respect of shareholdings, amounting to £57,756, which has been devoted to writing down part of the depreciation. After allowing for this, the shareholdings stand in the accounts at £1,291,452, while their aggregate value at Decembr 31 last, based upon market prices or upon the directors' valuations where no market price exists, was £1,175,752. The difference shown, amounting to £118,700, is more than covered by the reserve account of £160,000, and the sum of £38,568, brought in from 1910, which is carried forward to new account. The profit for 1910 amounted to £111,245. A year ago, £188,696 was written off in respect of shareholdings. Whereas the year 1909, in respect of which the directors were able to make a distribution of 10 per cent., was a period of remarkable market activity, the year under review was equally conspicuous for the general stagnation which prevailed. The financial position on December 31st, 1911, showed an excess of cash assets, first-class securities, and sundry debtors over liabilities of £252,722 9s.

* * * *

A Digger's Grievance.

The diggings correspondent of the Klerksdorp paper writes: "The diggers at Mooifontein are very dissatisfied at the prices being offered by the buyers, and some have decided not to sell here at all, but to send the diamonds to other markets. I was shown a parcel recently, the owner telling me that the prices offered him were simply ridiculous, and that he was sending them to London to be disposed of there. Of course, there are many who have not the funds to do this, and have of necessity to take what they can get. There is to be a meeting to consider a combined movement to regulate prices."

* * * *

Mining Profits in France.

The Minister of Public Works in France has submitted decrees granting concessions to the iron mines of Abbeville and Grand Rimont (Meurthe et Moselle) and to the gold mines of Beaume and Lauriére (Haute Vienne) for the signature of the President of the Republic. The terms of the concessions provide that iron mine companies shall pay the State 20 per cent. of the working profits. Gold mine companies are liable for 17½ per cent. of the working profits, 12½ per cent. of which is to be paid to the State and 5 per cent. to the working staff of the mines. Of the sum due to the State half will be utilised for surveying and for the development of the mining industry in France, while the other half will be invested in miners' provident societies. These mines will also be liable to the ordinary mining taxes.

* * * *

Devil's Creek Alluvial. Hydraulicking operations are in preparation just below the Kantoor at Kaapsche Hoop, we learn, on ground known as the Devil's Creek area. Mr. W. T. Hallimond is said to be largely interested in the undertaking.

* * * *

Knysna Alluvial. It is strange that so little news, practically none in fact, is abroad with regard to the work of the sluicing plant which was erected in the Millwood Creek, near Knysna, by Mr. Aiden Wilson, a good many months ago. The gravels worked for so many years previously by individual diggers certainly showed payable values, but the difficulty of operating a large plant successfully in the midst of the primeval forest did not appear to offer any great promise of profits. Hydraulic elevators were part of the plant, and it would be interesting to know how they served the purpose required.

* * * *

Standard Bank. A cheerful story, on the whole, was told by Mr. Horace Peel at the 97th ordinary meeting of the Standard Bank of South Africa held recently. During the current financial year, Mr. Peel says, the Union loan expenditure on railways and harbours may amount to £5,000,000. He expressed the hope that this and further moneys would be remunerative, and the railways and other public conveniences supplied by its help might ensure the development of South Africa in directions that should make it independent of both gold and diamonds when the deposits of these were worked out. Natal coal is supplanting Welsh to a large extent both at Capetown and Durban, and the Natal sugar industry continues to flourish in spite of the competition of the Portuguese grown commodity. Cotton is giving promising results, and would do better but for labour difficulties which are felt in all industries from one end of the Union to the other. Nothing, however, yet indicates that South Africa or Central Africa are going to turn the southern States of the North American Union out of their supremacy as growers of raw cotton, nor will South Africa do much to oust Argentina or Canada from their increasing dominance over the cereal markets. In grain growing there is none the less progress, and as its shareholders know already, the Standard Bank of South Africa stands to benefit by every advance made.

* * * *

Geduld. With reference to the proposed increase of capital and extension of reduction plant at the Geduld, we are officially informed that, on the 15th instant, the board of directors accepted an offer made to the company by Messrs. A. Goerz & Co., Ltd., to guarantee the subscription of 125,000 shares of the Geduld Company at par. These shares will be offered to shareholders of the latter company for subscription at the same price by circular to be issued on the 23rd instant. As a consideration for their guarantee Messrs. A. Goerz & Co., Ltd., have been granted an option over 100,000 Geduld shares at 25s. per share up to and including the 8th June, 1914. The money provided by the issue of above-mentioned 125,000 shares will be used for the extension of the reduction plant to a crushing capacity of 24,000 tons per month.

* * * *

Bellevue Tins, Ltd. Reference was made in our last issue to a flotation in connection with Bellevue claims, which was said to be on foot. As a matter of fact, the flotation was effected already, the registration having been made on the 19th March.

TOPICS OF THE WEEK.

SPECIALISATION IN MINING.

Rand metallurgists owe a debt of gratitude to Mr. H. A. White for his dignified vindication, last Saturday night, of their place and importance in the mining world. Many connected with the industry are prone to overlook the large part played by the metallurgist on the Rand. The annual dinner of the Chemical, Metallurgical, and Mining Society provided quite the most fitting occasion, and Mr. White an ideal spokesman, to assert the fair and natural claims of our metallurgists, as a body of scientific specialists, to a share in the credit for the position of the industry to-day. It will be remembered that the matter was touched upon by the President of the Institution of Mining and Metallurgy, Mr. Edward Hooper, in his inaugural address. Referring to the enormous growth in the output of gold in recent years, Mr. Hooper said that some credit for this increased production belonged, no doubt, to the mining engineer, who had applied himself so successfully to effecting economies in the cost of mining, raising and transporting ore; but the larger credit was due to the metallurgical engineer, who had so adapted the cyanide process to special conditions that low grade deposits, which could not otherwise have been profitably exploited, even subsequently to the introduction of that process on the Rand, had been worked to great advantage. Mr. Hooper went on to say that in the growing tendency throughout all trades and professions to specialise, the members of their profession, and more particularly those belonging to their institution, had been among the foremost, with the result that they had contributed appreciably to the elevation of their professional status. He maintained that they ought to have their schools for metallurgy as well as their schools of mines if the best advantage was to be taken of their student days. He did not mean separate institutions, but different time-tables, not merely in the third or fourth year, but from the commencement. Fortunately, Mr. Hooper's criticism does not apply to the South African School of Mines, where the excellent metallurgical course is kept separate and clearly defined. Mr. White did not mince matters in dealing with the anomalous position which the metallurgist has often been forced to occupy on the Rand. Without the cyanide process and its developments on these fields, he showed that four out of every five of our mines would be working at a loss or else closed down entirely. New and successful means for separation and collection of clean sand, evolved in their midst, were being introduced on many of the mines, and ideas from beyond the seas were being turned into valuable account in the treatment of slime and of gold solutions, wherever conditions were suitable. They were cutting down the area of copper required for amalgamation; they were crushing more finely and yet more cheaply, so that soon one pennyweight of gold, about one part in half a million, would represent the cost of its extraction, added to the value of the residue. "This," declared Mr. White, "is an age of specialisation—evolution is from the general to the particular—and the time has gone by when the general knowledge of all branches of science connected with mining, which is necessary for the successful control of this industry, is in itself sufficient for the practical working of all the processes required. Each branch demands a special study, and the advance of knowledge in all directions has become so great that in one branch alone can any man, however brilliant, lay claim to be an expert. Disastrous failures may accompany any ignoring of these important facts, and this has been illustrated more than once in this country." Mr. White's remarks call for neither elucidation nor emphasis. He has advanced an indisputable proposition. The metallurgist is a specialist of a very high order, and, as such, he is now indispensable to the progress, as he was once to the very existence, of the industry. The surprising thing is that any one could ever have forgotten the fact.

THE INDUSTRY AND THE LIQUOR QUESTION.

The whole question of natives and the liquor question has been revived by the "black peril" agitation which has convulsed the Rand of late. Mr. R. W. Schumacher, in a letter to the daily Press, has made the bold suggestion that since the illicit liquor traffic is clearly at the bottom of the recent wave of native crime, and since the former evil is incurable as long as conditions remain as they are, the total prohibition of drink now applied to natives should be applied to the whole community—white, black, brown, and yellow. We have been at some pains to collect the opinions of other mining men and industrial leaders on this suggestion, but the concensus of views seems against it, the majority describing it as "counsel of perfection." Of course, from the purely industrial point of view, Mr. Schumacher's proposal is deserving of the fullest measure of support, though for reasons other than those contemplated by its author. Anything that would lessen the supply of drink to natives must go to increase efficiency; and if the white mine-workers were to renounce alcohol their efficiency equally with their pockets would be the gainer. Undoubtedly, drink is the preponderating cause of the numberless cases of phthisis-stricken miners on the Rand, who find themselves penniless after years of hard work. That the drink habit is also a predisposing cause of phthisis has also been fairly conclusively established. Apart, however, from those somewhat irrelevant considerations, it may be recalled that the Liquor Commission appointed by the late Transvaal Government, in its findings, lent substantial support to Mr. Schumacher's views. Moreover, in a special report made by Mr. Honey, the Controller of Customs, who was commissioned to visit the United States on behalf of the Government, the following significant passage occurs:—"No special legislation exists for the supply of liquor to coloured persons, as, theoretically, all men are equal in the States, but prohibition prevails to a great extent in the Southern States, some twenty-five million people being under prohibition in the South, where most of the negroes live, and no doubt, despite the defects of the prohibition principle owing to lack of uniformity of legislation it must make it difficult for the black man to procure liquor, and prohibition is therefore popular in the States occupied by him. Although prohibition is legally in force in many of the States, it is admitted that, owing to the proximity of prohibition and non-prohibition and the national law, which does not permit of restrictions on imports from one State to another, it is evaded to a very great extent by private importations of liquor." It will be seen that Mr. Honey, in plain, official language, without emphasis, inclines to Mr. Schumacher's view. On the subject of total prohibition, the report of the Liquor Commission had the following:—

> Under point (*l*) of our reference we are required to report:—"Whether the Government or local authorities should be empowered to prohibit in any manner the sale of liquor in particular districts or areas in the Colony, and, if so, the extent of the prohibition." Such powers can only be required when the circumstances of the areas affected differ so widely from those of the remainder of the Colony as to need special treatment. . . . For this reason the difference between the more civilized and the less civilized native may be expected to increase rather than to decrease. In these circumstances it seems to us essential that provision should be made for exceptional restrictions in less civilized areas.

These extracts, at any rate, go to show that Mr. Schumacher's suggestion is not quite so impracticable as many would have us believe. His is a sweeping, indeed a heroic, suggestion to stay the growing menace of native crime. It flatters the white men of the Rand by crediting them with virtue and public spirit enough to make a great renunciation, and it is conceivable that a great wave of popular feeling might carry it to fruition. Though in the absence of such a popular arousing, little, perhaps, can be done to forward the proposal, we owe its author some return for the compliment he has paid the men of the Rand. If we cannot do anything to advance his proposal, we can, at least, refrain from opposing it.

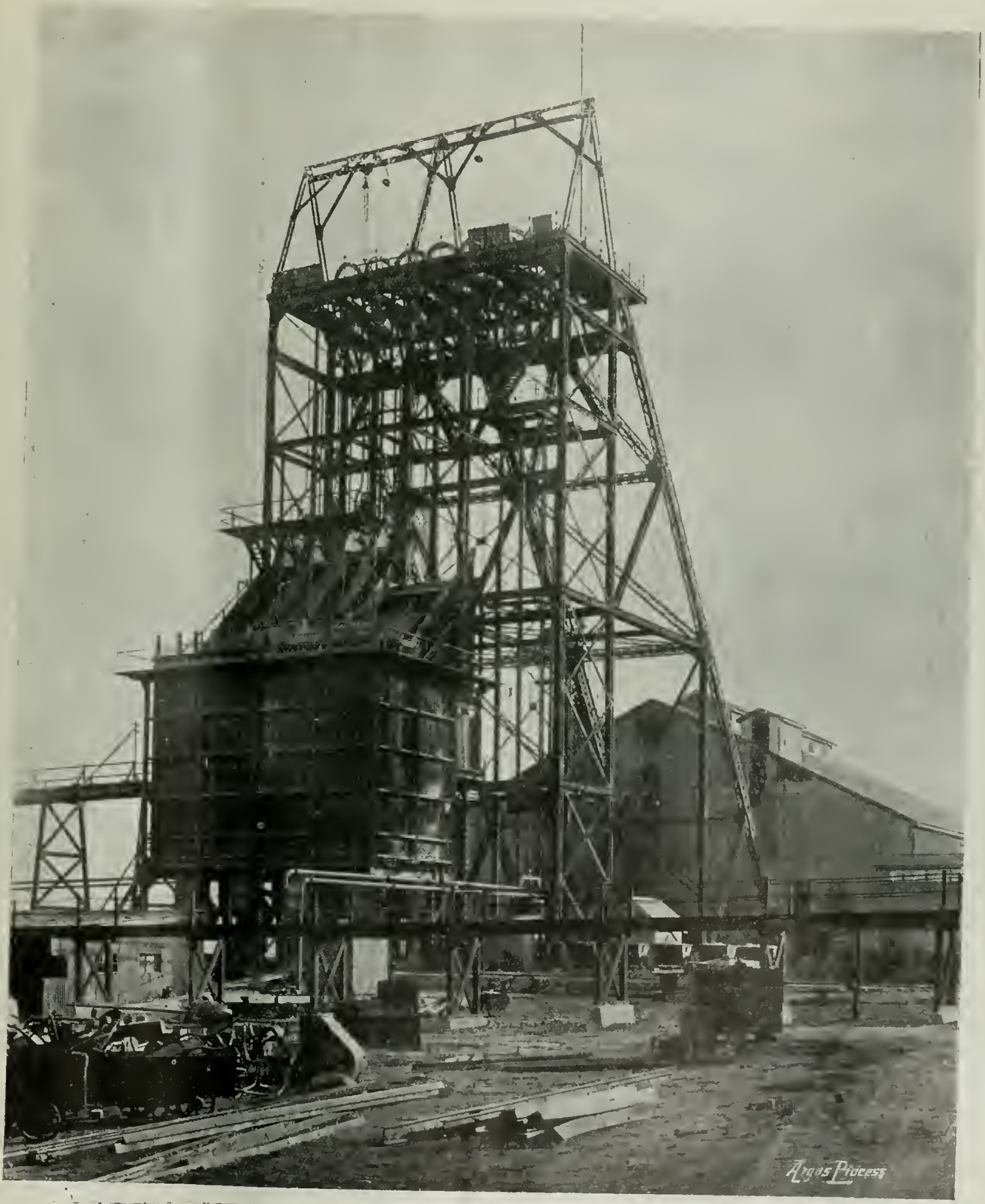
THE "MALAISE" OF THE MARKET.

Quite the most comprehensive and authoritative of recent reviews of our industrial problems was Mr. Frederich Eckstein's, delivered at the annual meeting of the Central Mining and Investment Corporation, held in London on Tuesday. His remarks on the subject of unfulfilled prophecies are not likely to fall on deaf ears, and when he urged that the "many chairmen in Johannesburg who had indulged in prophecies that had proved fatal" should, in the future, "confine their efforts to reviewing the past in a full and inpartial manner, and so regain the confidence of shareholders," he was voicing the opinions of many who hold the largest stakes in the Witwatersrand mining industry. Mr. Eckstein's remarks on this subject may well be read in conjunction with his lengthy reference to amalgamations, for although in the cabled report of his speech the two subjects are not dealt with together it is well known that failure to realize anticipations has to be laid chiefly at the door of the larger amalgamation projects. It must be admitted with regret that in the majority of instances the consolidation of mines has not, as yet, been attended with the results foreeasted at the time of fusion. From our point of view this has been the consequence of ill-founded expectations as to the time required to reorganise the contributory properties, rather than of any real inability of the mines themselves to earn the profits foreshadowed. The re-equipment of huge properties, such as the Crown Mines, for example, has taken longer than could have been foreseen. Organisation underground has had to be remodelled on the lines laid down and embodied in more recent ideas of the best mining practice, such, for example, as the driving of long main haulage levels and the concentration of work at main shafts. It is evident, however, that these troubles are gradually being adjusted. In regard to the Crown Mines, for example, Mr. Eckstein said an extensive programme should be completed before the end of 1912, when he hoped advantages would be reaped. He pointed out that the Central Mining Corporation was financing part of the present capital expenditure, and that it was the intention of the Crown Mines to consolidate this debt by the issue of a million five per cent. debentures. "Given good, honest management," said Mr. Eckstein, "I say these amalgamations which have taken place are right, and eventually it may not be unreasonable to advance further in the direction already taken, if terms acceptable to all parties interested can be evolved." "We are all agreed," proceeded Mr. Eckstein, "that provision must be made for unfortunate sufferers from what is generally styled miners' phthisis, but a portion of the burden must fall on the general public, who derive considerable benefits from the existence of the mining industry, just as pension or insurance legislation is most countries where it has so far been adopted is based on a system of contributions from the beneficiaries, the State and the employers. The men are undoubtedly entitled to consideration, but the fundamental ideas here laid down should, in my opinion, be observed. I trust that gradually the combined efforts of the Government, the men and the mining companies will succeed in greatly diminishing the ravages of the disease, and that any sacrifices shareholders are called upon to make will gradually decrease." It does not require any very lengthy study of a map of the Witwatersrand to have it clearly brought home that there are still areas which can best be operated in conjunction with adjacent properties. In the course of time all the southern mining blocks of the fields will be acquired by the companies owning claims to the north. Mr. Eckstein dwelt on the improvements being made in the mines, involving a large outlay—conversion of steam to electricity, etc. The real results of these changes, he pointed out, could not immediately be seen, and it was quite possible that another year would elapse before the full benefit would be apparent. Distance from the Rand has enabled Mr. Eckstein to see our problems, detached and in true prospective. Seeing them steadily and seeing them whole, he has been able to diagnose the *malaise* of the industry correctly. And a correct diagnosis, according to physicians, is three-parts of the cure.

VILLAGE DEEP: OUTPUT AND RECENT DEVELOPMENTS.

Recent Progress Quite Satisfactory.

Some little disappointment may have been experienced at the profit of the Village Deep, Limited, for last month, which, at £22,966 from 49,200 tons crushed, constitutes a decline, although not a large one, on the March earning. The decrease is, it is officially explained, due to a "lower tonnage stamped and to an instruction of the management to keep the grade to approximate the average value of the ore reserves." In regard to the actual position in the mine, recent developments have, so we understand, continued to be quite satisfactory, and the opening up of profitable stopes on the South Reef, an ore body which, until recently, proved of disappointing grade, is most decidedly a favourable feature. At the Turf Mines shaft, of which we here reproduce a photograph, electrification of winding plant has, we understand, been proceeding. Underground development in this section of the mine is being pushed forward, and in the near future the greater bulk of the tonnage crushed at the 180-stamp mill will be derived from this southern portion of the property. Working costs at the mine last month ruled at an average of 19s. 1d. per ton.



Turf Mines Shaft of Village Deep.

MINE LIFE ESTIMATES.

A Precedent Confirmed by the Neumann Group—The Lives of the Wolhuter and Wit. Deep—A Question of Vital Importance.

For the second time this year Mr. W. H. Dawe, the Chairman of the Neumann group of companies on the Rand, has afforded shareholders such information as has been available with regard to the probability of life of some of the mines under his control. At the meeting of the Wolhuter G.M. Co., in January last, he said:—" The question of the life of the mine is one which I approach with great diffidence, though I recognise that it is a question of the most vital importance to shareholders. As you are aware, the period during which work can be carried on in a given area is subject to many varying conditions, such as the dip of the reef, the width of ore-body, and its value." Having made it clear that everything depended on the variable factors referred to, he proceeded to work out a simple sum in proportion, the elements of the calculation being the area developed, the average milling tonnage obtained and obtainable therefrom per claim, and the area undeveloped. Probably no one who is sufficiently interested in mining to study, even in a superficial way, the conditions that make for stability or the reverse, is ignorant of the fact that the chief characteristic of the main factors in the problem is their inevitable variability, within wider or narrower limits. The fact that the Government insists upon life calculations as a basis for taxation, which are susceptible of periodical modification as a matter of fairness to both the Treasury and the mine-owner, has for long formed the ground for a demand from shareholders that they should be placed upon at least as favourable a footing for forming their own conclusions. Mr. Dawe apparently agrees with them that the question is of vital importance, and, relying upon their capacity to understand plain English, and upon their possession of normal intelligence, has ventured to publish the information at his disposal strictly for what it is worth.

The figures below are all that he has to give them, and they are such as may be arrived at in any mine office with comparatively little trouble. Every one who possesses shares in the Witwatersrand Deep Company will doubtless welcome the candid attitude adopted by the Chairman. They will, doubtless, already have made the attempt to work out the problem for themselves, or have relied upon such hazards as have been made by the financial press. For instance, it has been calculated unofficially that the life of the mine would be fourteen years from January last. Mr. Dawe, assisted by his consulting engineer, says thirteen years, so that those who have struggled with the problem with the assistance of such meagre data as previous reports have provided them with, have not fallen into serious error. At the same time, it is much more satisfactory to know that one is not more handicapped in the matter of knowledge on what Mr. Dawe calls vital questions, such as it is, than are those who have better facilities for getting at it. The information supplied by Mr. Dawe may not be altogether accurate, but it will serve its purpose very well until a change in the conditions of the mine makes modification necessary. At the next annual meeting the figures may be checked again, and so on, just as a matter of form, and as a guarantee of good faith, as the newspapers say. The life estimate of the Witwatersrand Deep, as far as can be made to-day, is worked out as follows:—

AREA.

	Claims.
Witwatersrand Deep	273·71
Portion Driefontein Deep	125·07
Other claims	5·72
Total area	404·50

TONNAGE FROM DEVELOPED AREA.

	Tons.
Ore reserves at 31st December, 1911	1,436,202
Less sorting (say 12 per cent.)	172,344
	1,263,858
Tons milled to 31st December, 1911	3,000,381
Total milling tons in developed area ...	4,264,239

DEVELOPED AND UNDEVELOPED AREAS.

	Claims.	Claims.
Wit. Deep old area (undeveloped) ...	273·71	
Plus overlap	12·00	
	285·71	
Less transferred to Witwatersrand G.M. Co.	2·88	
		282·83
Area developed: Old Wit. Deep, 31st December, 1911		162·88
Area remaining undeveloped		119·95
Undeveloped in Driefontein Deep ...		125·07
Total undeveloped area		245·02

	Tons.
If 162·88 claims (developed in Wit. Deep) yielded 4,264,239 milling tons, or 26,180 tons per claim, then 119·95 claims (undeveloped) should yield 3,140,000 milling tons, *less*, say, 10 per cent. for flattening dip, 314,000 milling tons, equal to a total (milling tons undeveloped) in the Witwatersrand Deep of	2,826,000
In the Driefontein Deep area there remain, as above, 125·07 claims undeveloped. On the same basis of 26,180 tons per claim, the tonnage left is 3,274,332, *less*, say, 15 per cent. for flattening dip, or 491,149 tons = 2,783,183 tons, *less*, say, 15 per cent. as safety factor, or 417,477 tons, leaving a balance of	2,365,706
	5,191,706
Reserves already developed as above	1,263,858
Total milling tons left at 31st December, 1911	6,455,564

Milling at the rate of 500,000 tons per annum will exhaust this tonnage in 12·91 years, say thirteen years.

Kolmanskop Diamonds.

The output of diamonds from the Kolmanskop property at Luderitzbucht for the month of April was 10·148 carats.

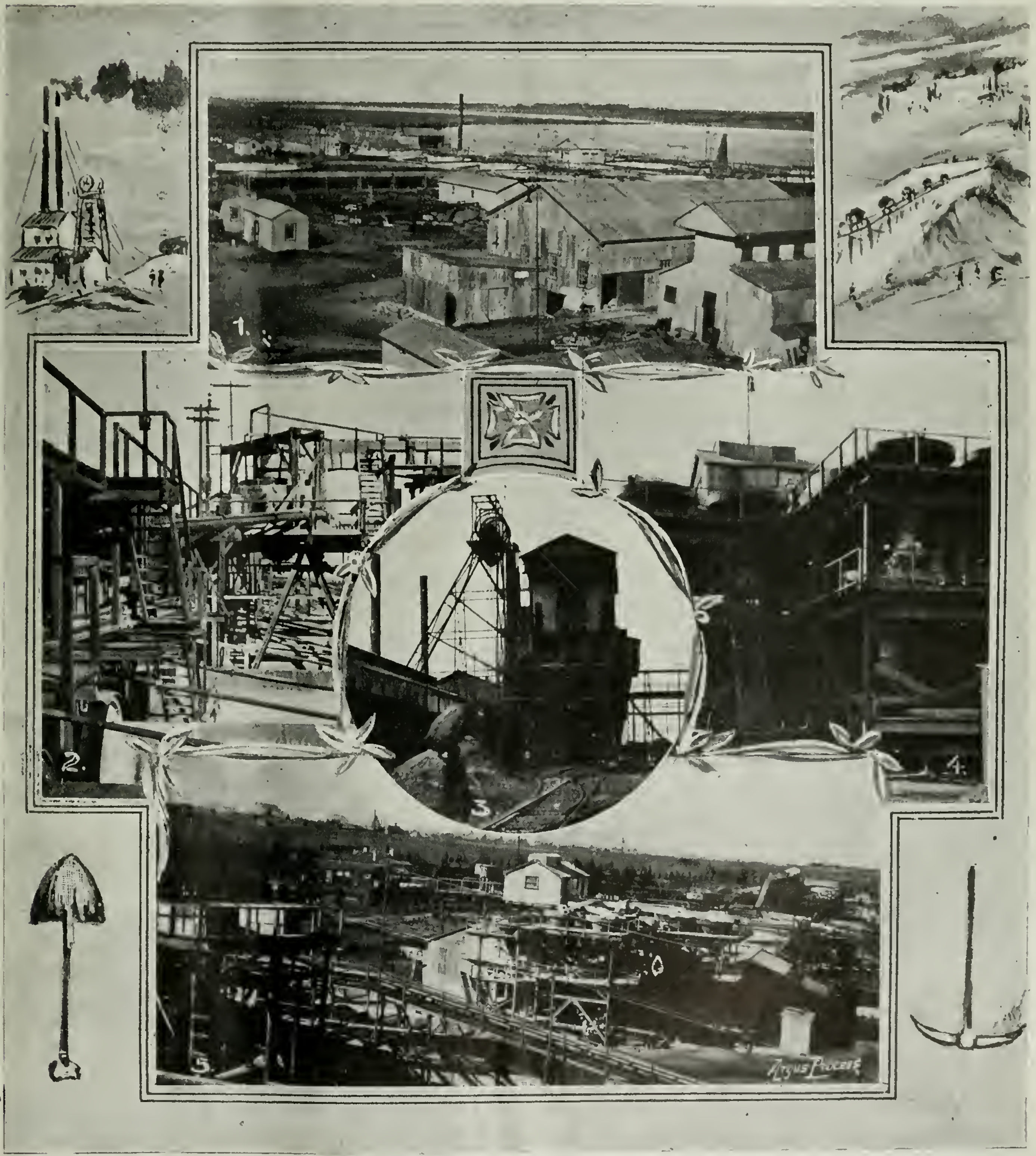
Messina April Operations.

The mill ran ten days, treating 680 tons of ore and producing 57·17 tons of concentrates, average assay value 52·5 per cent., and also 58 tons middlings assay value 16 per cent. copper. Only ore obtained from development work was treated. The total footage was 680 feet. The values disclosed by development are very satisfactory for the month, the average being well maintained. A diamond drill has been started to prove the North Lode below 8th level at No. 4 Shaft. Erection of new Babcock and Wilcox boiler and stack is completed, and the framework for the extension of boiler-house has been erected. Three new cottages have been added to the staff quarters.

Mines of the Witwatersrand.

XVII.—SIMMER DEEP, LTD.

A Low Grade Deeper Level—Important Ventilation Schemes—Encouraging Results from Hammer Drills—Finances and General Outlook.



1. Simmer Deep-Jupiter Joint Slime Plant. 2. Simmer Deep-Jupiter Joint Tube Mill Plant—Fifteen Tube Mills in line. 3. Headgear and Ore Bins at the Milner Shaft. 4. Simmer Deep Jupiter Joint Plant—Caldecott Cones and Tables. 5. Simmer Deep-Jupiter Joint Sand Plant.

The Simmer Deep—an amalgamation of "Gold Fields" deep level properties lying on the dip of the Simmer and Jack Proprietary, and embracing a total area of 1,035 claims—is a typical deeper level Rand mine of rather under average ore grade. It is notorious that managers of propositions of this nature have had a veritable path of thorns to tread during the last year or two when additional burdens of taxation have been constantly threatened or actually imposed, and when native labour recruiting charges have been continually increasing. For some months past the profits of the Simmer Deep have been on the decline rather than the increase. The working profit earned during last year was £56,783, which gives the very small margin of 2s. 1d. per ton of ore crushed. As to the outlook for the immediate future the latest official estimate is to the effect that an average recovery of not more than about 18s. per ton can be expected.

Importance of Low Costs.

Accordingly, the prosperity of this company is largely wrapped up in the question of working costs. The Jupiter, a sister mine adjoining the Simmer Deep on the west, is in a similar position. These two companies possess a joint plant of 108,000 tons per month capacity—300 stamps and 15 tube mills, the proportions at present being Simmer Deep 180 stamps and 9 tube mills, and Jupiter 120 stamps and 6 tube mills. In order to reduce costs—a most necessary achievement at the Simmer Deep—operations on as large a basis as possible is imperative. But for various reasons the company has not as yet been able to utilise its large equipment to full capacity.

The Ventilation Scheme.

With a view to lowering costs and increasing the small margin of profit which the Simmer Deep ore admits of being earned, every endeavour has been exercised in the direction of improving underground labouring efficiency. Special attention, therefore, has been accorded the question of ventilation. The Simmer Deep is, as a matter of fact, one of the deepest mines on the Rand, a maximum vertical depth of just under 5,000 feet having been attained. There are three shafts—the Milner or West shaft, the Rudd or Central shaft, and the Clement or Eastern, situated on the borders of the township of Germiston. The Milner and the Clement are used for hoisting men and ore, the Rudd being employed solely as a water and ventilation shaft. A large Sirocco fan has been installed at the Rudd. This shaft can be sealed over, and is the central and chief point in the admirable ventilation scheme which has been carried out at the Simmer Deep, and which has so greatly improved the underground working conditions. The Milner and Clement are downcast shafts and the air descending is "split" into five currents, which travel throughout the workings. In the Milner the air is confined within the shaft area by means of doors and is carried down to the 21st level. By means of doors and bratticing the air is here divided into two portions, one volume ventilating the stopes and drives, etc., to the west of this shaft, that is to say, towards the Jupiter boundary, the other portion travelling eastwards and, of course, upwards. In the Clement section there are three air "splits." A certain amount of the air is led off at the seventh level to serve the upper workings of the mine. The remainder travels to the 16th level, where it is split into two currents, one ventilating the eastern portion and the other the western. Particular attention has been given to the allaying of dust, and sprays are in use throughout the workings. To ensure the delivery of a sufficient supply of water, three dams have been constructed underground. One of these is of 26,300 gallons capacity, another of 13,550, and the third of 9,000 gallons capacity.

Development, Ore Reserves and Stoping.

Since the date of the last report there has not been any very marked or noticeable change in the development position, and the ore reserves stand approximately the same, both in regard to tonnage and value as at the end of last year, viz., 1,312,000 tons of 4·9 dwts. average assay. The most important development work being undertaken at present is on the 21st level going west from the Milner. This is being pushed ahead with a view to effecting connection at this point with the Jupiter. The Simmer Deep and Jupiter mines are, it may here be remarked, joined up on the 14th level. As regards stoping operations, reference must be made to the extensive use of machine drills. In a mine such as the Simmer Deep where the margin of profit is exceedingly small, tonnage is a most vital consideration, and in the absence of a sufficiency of native labour much depends on achievements with small drills. Success is anticipated from the employment of hammer drills in particular. A few days ago ten of these machines were started up in the Simmer Deep, and the results secured have been wholly gratifying. There is very little reclamation work to be carried out at the Simmer Deep—in contradistinction to the Knights Deep—and it is clear that in this property hammer drills will have to be adapted to the stope faces. They are also being employed on winzing work.

The Equipment.

The Simmer Deep is a large property with shafts distributed over a huge area, a circumstance which does not tend to a low rate of expenditure, despite the fact that the means of transporting ore to the mill—by means of steam locomotives—is cheap and efficient. The 300 stamps in the joint Simmer Deep—Jupiter battery are now running at 95 drops per minute and crushing through a 16-mesh, the duty being about 13½ tons per head per diem. There are 15 standard 22ft. 6in. tube mills arranged in parallel, this constituting the longest line of tube mills employed on the Rand. All plates are now stationary and are situated in the tube mill house, shaking tables having been done away with. Previous to this change the amalgamating area was 6,801 sq. feet, but to-day this amounts to only 2,842 feet. Caldecott tables and cones form a prominent feature in this plant. There are two tables of 20 feet diameter with a 2ft. 6in. filter bed and one of 25ft. diameter with a 3ft. filter bed. To each table there are four primary and two washing cones.

Finances and General Outlook.

The balance sheet presented to shareholders at the last annual meeting—in March—showed a balance to credit of working expenditure and revenue account at December 31st, 1911, amounting to £53,838. The financial resources of the company, so far as can be estimated at present, are sufficient to meet all debenture obligations for the next two years. It is hoped, with some reason, that within that period the mine will be placed on a more satisfactory profit-earning basis. The area, over 1,000 claims, is vast, and a huge amount of development of course remains to be carried out. Any estimate as to life must necessarily be a mere approximation, and in these circumstances a forecast as to the life of the mine is too problematical an affair to give expression to. It is, however, certain that the Simmer Deep and its sister mine, the Jupiter, have ore contents sufficiently great to enable them to carry on productive operations for many years to come.

Far East G.M. Syndicate.

On an *ex parte* application, made last week to the Master of the Supreme Court re the Barberton Far East G.M. Syndicate for the appointment of a liquidator, an order to that effect was granted.

Sabie Mining.

The Rex and the adjoining property, the Long & Dempsen, have closed down. The ten stamps being erected on Rietfontein (T.C.L.) are practically completed, and possibly will start dropping some time next month. The G.H.L. Syndicate (Spitzkop) had a very successful run last month.

THE LOWER WITWATERSRAND SYSTEM.

Where Good Exposures and Sections may be Seen—Evidence Relied upon by Dr. Mellor—Elimination, Faulting, and Unconformity Data.

In our issue of the 6th January last we reproduced two sections of the Lower Witwatersrand System as exposed on the Rand, one composite and the other taken from the eastern side of the Witpoortje Gorge. Particulars were also given of the characteristics of the component beds of these sections, abridged from Dr. Mellor's more detailed description of them in his paper on "The Normal Section of the Lower Witwatersrand System." Since that paper was read before the Geological Society some useful notes have been added by the author, in which a list is given of a few special localities where good sections and exposures of the various beds may be most readily seen. The list is given below, and we may take the opportunity of pointing out that the Transactions of the Society, Vol. XIV., from January to June, 1911, and from July to December, 1911, in which Dr. Mellor's two papers, with their accompanying maps and diagrams, appear, are now obtainable from the Assistant Secretary, Mr. W. W. R. Jago, Standard Bank Chambers. In the following notes we have added a few data from other portions of the papers referred to, which may help to make the information clear to those who have not the Transactions at hand:—

Localities of Good Exposures and Sections.

(I.) General Sections.—*Hospital Hill Series.*—Observatory Township, traverse from the small poort at east end of Mountain View along line a little west of boundary of Observatory Township, southwards to east end of Observatory Ridge; unconformable beds on north side of valley along the margin of the amygdaloid, may be visited by following Ripple-marked Quartzite three-quarters of a mile eastwards to its termination. Traverse may be continued southwards from Observatory Ridge by eastern foot of Langerman's Kop to duplication of Hospital Hill Beds near the Monument to Scottish Horse on Kensington Ridge.

Government Reef Series.—Along Hamburg line of section; best reached from Roodepoort Station or Hamburg Siding.

Along the Witpoortje line of section from Witpoortje Station east of the gorge, towards conspicuous shafts on the Promise Reef.

Along the line of section from Driefontein Station or Sialkot Siding, on the Pretoria line, about three-quarters of a mile east of an parallel to the west boundary of the farm Rietfontein. An old boiler is a good landmark along the line referred to.

A good section, and one very readily accessible, can be seen by taking a line N.N.W. from Florida Station to middle point of N. side of Vogelstruisfontein, passing a little to the east of Hayes' farm (with a group of conspicuous gum trees), lying near the head of the Florida Spruit. By returning towards the north boundary of Maraisburg township along a line just south of the outcrop of the Hospital Hill Quartzites, as shown on the map, the faulting out of the Government Reef Series in this direction is well seen.

(II.) Smaller Groups of Beds and Special Horizons.—*Orange Grove Quartzites: Main Group.* A1. At small poort near east end of Mountain View Township and near Orange Grove; junction with granite (much weathered) shown on west side of poort, but better seen about three-quarters of a mile further east, as also the conglomerate at base of quartzite, often seen on faces of fallen blocks on slope of escarpment.

A2. Observatory Township, N. end of Steyn Street; Houghton Estate, N. and S. of St. David's Street; Parktown West, extreme N.W. corner, near cutting in ridge, good section. Underlying diabase also well seen to N. Melville, throughout the township. West Dene, N. portion of township.

B. *Water Tower Slates.* — Observatory Township, Schmidt Street, also further east. Parktown, near water-towers.

C. *Ripple-marked Quartzite.*—Observatory Township, Delarey Street and to east. Parktown West.

E. *Speckled Bed.*—Observatory Township, near east end of Observatory Avenue and further east. Kensington, S. side of Roberts' Avenue, to N.E. of Monument.

F. *Hospital Hill Slates.*—Observatory Township, near east end of Observatory Avenue and to east. Kensington, S. side of Roberts' Avenue, to N.E. of monument. Old Show Ground, N. of Hoofd Street, Johannesburg (best exposure), and near the brewery to west.

G. *Shales associated with Hospital Hill Quartzites.*—West end of Brixton township, also Witpoortje section.

H. *Hospital Hill or Green Quartzites.*—Hospital Hill and Observatory Ridge, lowest band (H) only. West end of Brixton Township. Witpoortje section.

J. *Promise Reef Beds.*—Prospecting works, east of reservoir and near main telegraph line. 1½ mile N.E. of Roodepoort Station. Prospecting works ¾ mile N.N.E. of Witpoortje Station.

K. L. *Coronation Beds.*—Witpoortje section (Coronation Reef well seen). Hamburg section along a line following the west boundary of the township of Hamburg and continued north and south (Coronation Shale well seen in prospecting trenches). Also crossing the Main Reef road and the railway 1½ miles N.W. of Roodepoort Station, just south of big bend to west. Best exposures about ¼ mile east of railway line. Also ¾ mile N. of Driefontein Station, just east of main road leading N. on to Barretts' Rietfontein.

M. N. *Government Reef Beds.*—Witpoortje section. Hamburg section. Section near Barretts' Rietfontein, near main road from Driefontein.

n¹. *Government Reef.*—As above, especially well seen in prospecting works north of railway between Florida and Hamburg, also near Witpoortje.

O. *Shale above Government Reef Series.*—Hamburg section, also N. portion of Florida township, and W. of Maraisburg Station.

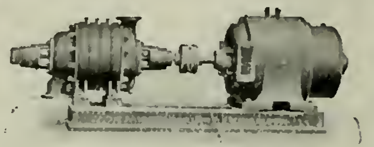
P. *Sandstones in lower part of Jeppe's Town Series.*—Hamburg section (just south of railway line). Florida, N. of railway station.

Q. Florida, N. of station.

(III.) Effects of Faulting.—Juxtaposition of Hospital Hill Quartzites to Orange River Quartzites, elimination of Park Town Beds, 1½ miles N.N.E. of Florida Station; see map. Juxtaposition of Older Granite and Hospital Hill Quartzites, elimination of greater part of Hospital Hill Series, Barrett's Rietfontein, just east of main road and about ⅓ mile east of boundary of Elandsfontein. Juxtaposition of Contorted Bed to quartzites of Government Reef Series, elimination of Hospital Hill Quartzites, Kensington, opposite Sanatorium, also east end of Kensington township near west boundary of Elandsfontein. Elimination of greater part of Government Reef Series, to N. and N.W. of Maraisburg, the cutting out of the Coronation Shale well seen near middle of northern boundary of township on main telegraph line. Elimination of beds between lowest Hospital Hill Quartzite and Lower Coronation Quartzite, Barrett's Rietfontein from east to west. Folding of Orange Grove Quartzites, eastern slopes of projecting portion of escarpment, northern portion of Waterval.

The Sheba.

The following are particulars as regards the April results of the operations at the Sheba mine:—65 stamps crushed 5,350 tons; yield, 2,971·425 fine ozs. gold, value £12,621 16s.; profit, after allowing for development and administrative expenses, £4,161 1s. 4d.



Write for List 495.

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AGENTS FOR THE TRANSVAAL:
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New Heriot: Dividend Declared.

The New Heriot G.M. Company has declared a dividend of 40 per cent., payable to shareholders registered on 31st inst.

Benoni Consolidated.

The results for April were as follows:—45 stamps ran 28 days; tons milled, 17,600; gold recovered, mill 3,474 ozs., cyanide 898 ozs., total 4,372 ozs.; recovery per ton milled, 4·968 dwts.; working costs, £17,542; revenue, £18,318; profit, £776. No allowance made for development other than the actual cost of work done. On 3rd of May stamps hung up on account of Board of Directors' decision to suspend operations. Final clean-up of the works not completed. The balance of gold recovered will be declared during May.

Lydenburg Farms.

For the purpose of confirming certain resolutions which were passed at a special general meeting of shareholders of the Lydenburg Gold Farms, Ltd., on April 12, a further meeting was held last week. Mr. Richard Baumann presided, and the following resolutions were confirmed:—"That the company's capital of £250,000, divided into 250,000 shares of £1 each, be reduced to the sum of £50,000 divided into 250,000 shares of 4s. each, fully paid up, by (a) paying off in cash to shareholders the sum of 6s. 8d. per share in respect of the company's share capital, which is unrepresented to that extent by available assets." "That the directors be authorised to take the necessary steps to secure the registration of the company with the reduced capital." "That the directors be voted a sum of £1,000 in recognition of the services rendered by them to the company."

The Diamond Fields.

A Kroonstad Proclamation.

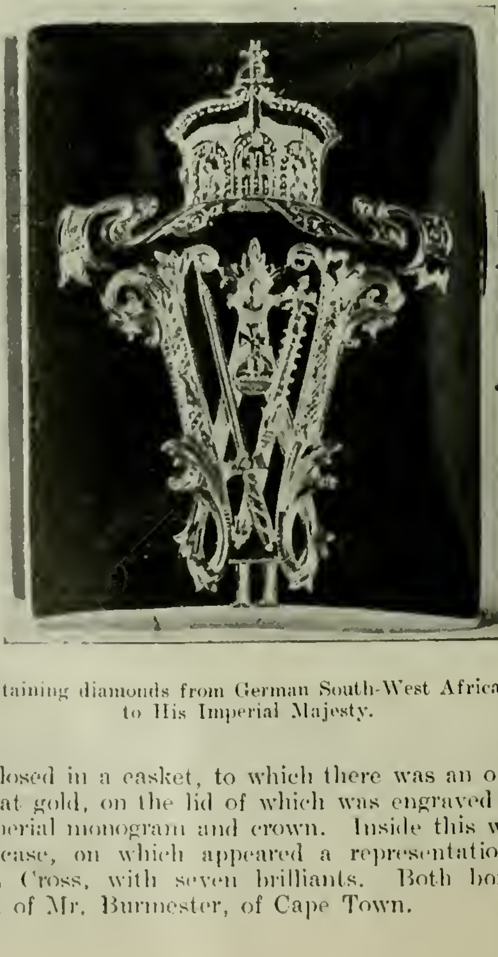
A portion of the farm Bambata No. 1369, District of Kroonstad, in the Province of the Orange Free State (owners, G. W. van der Berg and W. D. Watson), will be proclaimed as an alluvial digging for precious stones on the 28th day of May, 1912, and the licences to peg claims may be obtained at the Office of the Detached Assistant Resident Magistrate at Bothaville on and after the 27th day of May, 1912.

Latest from the Diamond Diggings.

The finds at Goedgenoeg during the month of April have been announced at 115½ carats, value £891, as compared with 92¾ carats, value £818 15s., in March. There were 58 individual returns, the largest diamond being one of 12¾ carats, value £150. The stones found at this field are said to be fetching good prices. Another portion of Mooifontein was thrown open on Wednesday, but the claims wanted were pegged without excitement. Some good finds are reported from London, and hopes are entertained that valuable ground, as good as that at Mooifontein, will yet be discovered there. The unproclaimed portion of the farm is now being prospected by a dozen prospectors. From several of the diggings comes news of diminished numbers of diggers, due to the departure of the farming element to reap their crops, though many of these are expected to return to the quest for diamonds.

An Interesting Gift to the Kaiser.

Herr Dernburg, formerly Colonial Secretary to the Kaiser, on his return from his Colonial tour, was the bearer of an interesting gift for his Imperial master. This consisted of a number of diamonds, the first discovered near Luderitzbucht, German South-West Africa. The stones were enclosed in a casket, to which there was an outer case of 18-carat gold, on the lid of which was engraved the German Imperial monogram and crown. Inside this was fitted another case, on which appeared a representation of the Southern Cross, with seven brilliants. Both boxes were the work of Mr. Burmester, of Cape Town.



Casket containing diamonds from German South-West Africa presented to His Imperial Majesty.

A RAND MINES POWER COMPANY'S COMPRESSOR STATION.

A Magnificent Turbo-Compressor Plant at the Robinson Central—Twelve Motor-driven Units—Three Types of Compressors.

Hardly second in interest to the power stations of the Victoria Falls and Transvaal Power Company, Ltd., and its subsidary, the Rand Mines Power Supply Co., Ltd., at the Simmer Pan and Rosherville, is the magnificent air compressor station of the latter company near the site of the old Robinson Central shaft. Established as a source of compressed air supply for the mines of the Central Rand, although linked up with the air mains from the Rosherville station, it distributes power for stoping and development purposes to a group of the most important gold mines in the world, including the Crown Mines, Robinson, Ferreira Deep, Village Main Reef, Village Deep, and City Deep. Here, on the eastern side, the influence of the station probably ceases, for there is a sort of balancing point between the streams of compressed air which come east and west from the Robinson and Rosherville. To those who have been accustomed to the older type of compressor, run directly from steam-driven reciprocating engines, the spectacle of a series of turbines running almost noiselessly, and with scarcely a tremor, impelled by electric motors at a speed of 3,000 revolutions per minute, and with every moving part concealed from view, is one which cannot fail to attract profound attention and admiration. The rapid substitution of rotating for reciprocating machinery, as Mr. Louis C. Loewenstein remarks in the *General Electric Review*, has been one of the most striking engineering developments of recent years. The marked success of the steam turbine no doubt stimulated the development and introduction of the centrifugal pump and, more recently, the centrifugal compressor. The centrifugal compressor to-day stands in the same relation to other compressors as the steam turbine stood fifteen years ago to the reciprocating engine, or as the centrifugal pump stood five years ago to other pumping apparatus. Although the initial development of the centrifugal compressor was first begun in Europe, the General Electric Company started about three or four years ago to develop and introduce it abroad; and the marked success attained is well substantiated by the large number of successful units in commercial operation. A centrifugal compressor resembles a centrifugal pump, except that in the former elastic fluids are compressed and in the latter fluids comparatively inelastic are pumped. A centrifugal compressor consists of a revolving impeller mounted on a shaft supported in suitable bearings and surrounded by a stationary set of discharge vanes supported in a suitable casing. If the desired amount of compression is small, a single impeller suffices, and the apparatus is known as a single stage compressor; if the compression desired is larger a multi-stage compressor is used, which consists of two or more single stage units mounted on the same shaft and operating in series within a common casing.

Centrifugal Force.

As the name centrifugal compressor indicates, centrifugal force plays an important part in its operation. When set revolving, the impeller will, by centrifugal force, entrain a fluid, say air, at its inner circumference and will discharge it at its outer circumference at an increased pressure. This pressure can be called centrifugal pressure. Besides this the impeller has set the air into motion; and at its outer circumference, or discharge end of the impeller, the air is moving at practically the same velocity as the peripheral speed of impeller. Hence the work delivered by the driver to the impeller if the centrifugal compressor appears in the air discharged from the impeller in two forms of energy, pressure energy and velocity energy. It is the function of the stationary set of discharge vanes to convert the velocity energy into pressure energy. The discharge vanes are so designed that the air in flowing through the passages between the vanes is gradually reduced in speed and the velocity energy recovered in the form of an increase of pressure energy. Roughly speaking, about 95 per cent. of the energy supplied by the driver to the compressor appears as pressure energy and velocity energy in the air leaving the rotating impeller. About one-half of the available energy is in the form of centrifugal pressure, while the other half is in the form of velocity. In an ordinary fan or blower this high velocity of the air is allowed to dissipate itself chiefly into eddy currents, and finally exists in the air in the form of heat. In the centrifugal compressor this velocity energy is largely recovered in the form of increased pressure. Hence the vital difference between an ordinary fan or blower and a centrifugal compressor lies in the fact that the former does not recover any of the velocity energy generated by the rotating impeller, whereas the latter recovers the larger part of the velocity energy so produced. It can be readily seen why the centrifugal compressor is so highly efficient and why this recent type of air compressor is replacing all older types.

General Advantages.

Besides its high efficiency there are other advantages which aided in the introduction of the centrifugal compressor. On account of its operating at high speeds this compressor is much smaller in size than any other compressor delivering the same work; and further, because it can run at high speeds it can be direct connected to high speed drivers, which are in themselves smaller and more efficient than those which must operate at low speeds. This is especially true of the steam turbine, and a turbine driven centrifugal compressor forms an ideal arrangement. Ample clearances can be provided about the impeller, and if the bearings are properly designed and provided with efficient lubrication, no rubbing parts exist; so that the original efficiency of the unit is maintained after years of service. Compare this to the performance of displacement or positive pressure blowers where frequent renewals are necessary to maintain somewhere near the original efficiency and output; or compare this compressor to the inefficient and large fans or blowers, and it then does not seem strange that the centrifugal compressor has made such great strides commercially, and is supplanting other forms of compressors in almost all fields of service. The efficiency of centrifugal compressors will be steadily improved as we gain more theoretical knowledge of the laws governing air flow, but the fundamental principles involved are well understood and are quite simple.

The Robinson Central Plant.

The compressors which are comprised in this plant are twelve in number, and contained in one lofty and capacious engine room. Stage compression is adopted, so that the twelve units form six compressor sets, in which the air is passed from one to the other of a pair of turbines with intermediate coolers. The first to attract notice are two sets, or four units, of the A.E.G. type, each unit being of 2,000 h.p., making a total of 4,000 h.p. for the set. The speed of motors and turbines is about 3,000 revolutions per minute. The air, having been raised to a pressure of about two atmospheres in the first compressor, passes below the flow line to an inter-cooler and thence up again to the second turbine, where it is finally compressed to eight atmospheres, or thereabouts. Following the four turbines of the A.E.G. type come two, or one set, designed and made by Pokorny and Wittekind, Maschinenbau A.G., Frankfurt a.M. These engines, we learn, were designed in Germany in accordance with theoretical data solely, constructed and tested in Germany, and sent to the Rand built up, with the parts sealed to prevent unnecessary tampering. Since their erection here they have run without a hitch, and without requiring alteration of any kind, and are a standing tribute to the accuracy of their planning and the general excellence of their construction. Here the cycle of compression differs from that of the engines previously described. Instead of being compressed through the first

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stage in one turbine and then crossed for final compression to a second, the entering air is divided at the outset between the low pressure ends of each compressor, is then passed in a combined flow to the high pressure section of one of the units, where further work is done upon it, and thence through an inter-cooler to the high pressure section of the other unit, where the final compression to about eight atmospheres is effected. The third type of turbo-compressor is that of the Gutehoffnungshütte, Oberhausen, in which the cycle of compression is somewhat more complicated than in the other types already described. In this case, as in the last, each unit comprises a high and low pressure section on the same shaft. The air entering at one end of the first unit undergoes a preliminary compression in one section, passes thence to an inter-cooler and back to the high pressure section of the same unit. Thence it flows onwards, by way of a second inter-cooler, for its next stage of compression at the low pressure end of the second unit. A third process of inter-cooling follows, and then the final work is done in the second portion of the unit. A further cooling is effected after the air leaves the last turbine for the mains. There are thus four stages of compression and four periods of cooling. The speed and output of each set of each type of turbo-compressor is about the same.

Air Cleaning Process.

In order to secure purity in the air supplied to the compressors a large filter installation is erected upon one side of the building. The air enters the chamber through wide openings at some distance above the ground line, and then a series of cloth-covered frames which compose the filter. There are 8 sections of 35 frames each, ranged in 4 tiers one above the other. Each frame has an area of about 5 ft. by 3 ft. 6 in., and they are placed at distances of about ¾ in. apart. The purified air which passes through is divided into two chambers below, so that the filter may be conveniently overhauled and renewed in sections without delaying operations at the turbines.

Air Mains.

The compressed air from each turbo set is conveyed through separate 12-inch mains to a 24-inch main outside the building. The 12-inch mains are each furnished with an orifice between flanges, similar to that described in a paper read by Mr. J. L. Hodgsón, B.Sc., A.M.I.C.E., before the South African Institute of Engineers last August, on "The Metering of Compressed Air." Pipes connect the upstream and downstream pressure holes in the orifice to a manometer in the engine room. More precise measurements are made, of course, by Venturi meters, at the mines where delivery is made to the consumers, but that at the Central Station serves as a fairly close check upon the aggregate of the others. The 24-inch main which takes the air supply from all the compressors is joined up with the east and west main from Rosherville. A second 24-inch main, running parallel with the first, is connected to it at each end of the station, and by a suitable arrangement of valves may be made to act as a by-pass if it should be desired to cut out a portion or the whole of the supply from the Robinson Central Station. Other valves divide the supply mains of the latter station into two groups, so that each three turbo-compressor sets may be run independently or alone without disarranging operations. At present three sets only are being run continuously, as at Rosherville.

Water Supply.

The water required for cooling purposes is taken from the Robinson dam, through a deep brick-lined channel at the entrance to which are two coke filters. The latter arrangement allows of renewal at alternate periods, and ensures a fairly clean and continuous supply. The water is pumped through the system of coolers by three Balcke centrifugal pumps driven by 550-volt Siemens Induction Motors. All the motors which are used at the station are, it may be added, of Siemens' construction, those which drive the turbo-compressors being Siemens 1,700-volt 3-phase synchronous motors. The power used at the Randfontein Central Station is obtained from Rosherville, and is transformed down from 40,000 to 1,700 volts, there being a separate 4,000 K.V.A. transformer for each compressor. A distributing station for current from the new power station at Vereeniging is being erected adjacent to the compressor house.

Clarifying Cyanide Solutions.

The following notes on an experiment relating to the clarifying of cyanide solutions are given by Chester Steinem, Mogollon, New Mexico.

Probably the two worst zinc-box troubles are: (1) the deposition of fine rock particles on the zinc from "cloudy" solutions and (2) the deposition of a zinc slime from complex zinc compounds in solution. The effect of the latter is principally to coat the zinc shavings making them inefficient, while the former not only has this effect but makes much short zinc, and a low-grade precipitate. Naturally the low-grade precipitate necessitates more time and flux in melting. To clarify cyanide solutions, it occurred to me that the process now in use for purifying city water might be useful. This method consists essentially in adding a small quantity of aluminium alum in solution to the water to be purified; the "lime" in solution precipitates aluminium hydroxide, which coagulates the impurities in the water. The mixture is run through a settling basin where the coagulated portion is settled out. The water is then put through a special type of sand-filter to finish the work. The process is used on river water containing the minutest clay slime and the water is so purified as to be clear and practically free from bacteria. H. W. Miller and I made experiments to determine the effect of the alum on cyanide solution. First a sample of muddy "box-heads," running about \$2·25 in gold and silver, was treated with alum (about 2 lb. per ton, which is a comparatively large quantity). A voluminous precipitate immediately appeared and a slight odor of HCN was noticeable. The precipitate was allowed to settle. In less than an hour all had settled except for a small quantity which floated on the surface. After settling, the solution was titrated for cyanide and was found to run slightly higher than the original. The settled precipitate gave a good test for zinc. The solution was assayed for gold and silver and was found to have lost about 5c. per ton. Not having facilities for a quantitative analysis at hand, the relative amount of zinc precipitate was not determined. Considering the results, the following suggests itself for mill work: A long narrow reservoir containing baffle walls similar to those in zinc boxes. If the final compartment is filled with oakum, excelsior, or a similar material, the sand-filter can probably be dispensed with. The other compartments should have facilities for drawing off the coagulated material at the bottom. An extra set of zinc boxes would do for experiment. Such a scheme, while it would probably require considerable storage space, would be cheap, as alum costs but \$1·75 per 100 pounds.

New Diggings: Early Proclamation.

Mr. T. Melville du Toit, the Acting Inspector of Claims, will proclaim the extension of the Barkly Commonage at ten o'clock on the 22nd, and the Gong-Gong diggings on the 23rd, where two proclamations will be read at ten and eleven o'clock respectively. The remainder of the unproclaimed portion of the Barkly West Commonage, excluding the racecourse as beaconed off, and the whole unproclaimed extent of that portion of the farm H.V. No. 48, Gong-Gong, owned by the Proprietary Mines, Limited, will be proclaimed. A Gong-Gong syndicate is constructing an extensive water scheme to supply the Gong-Gong diggers with water.

TRANSVAAL COAL v. NATAL COAL.

Vigorous Refutation of the Auditor-General's Criticism of S.A.R. Policy—General Manager Replies to Auditor-General and proves Advantages of Using Transvaal Coal.

Some time ago considerable prominence was given in the Press, notably in that of Natal, to the criticism of the S.A.R. by the Assistant Auditor-General for using Transvaal, instead of Natal, coal on the Cape section of the system. Before the Select Committee on Public Accounts that sat recently in Cape Town, Mr. Hoy made the following convincing reply to his critic. He said:—

By letters dated 27th November and 18th December last, the Assistant Controller and Auditor-General drew attention to the increased consumption of coal, in pounds per engine mile, that had taken place on sections of the line in the Cape Province, south of Touws River, during the first six months in which Transvaal coal was substituted for Natal coal, i.e., April to September, 1911, as comwith the six months ended 31st December, 1910. The matter was receiving the attention of the Administration, and an explanation was in course of preparation, when I was informed by the Railway Board, on the 9th of January, that the Auditor had submitted the matter to the Board, who called for a report. My reply dated 25th January, 1912, was considered by the Railway Board, and the Assistant Auditor was furnished with a copy. A brief summary of the matter is as follows:—The Assistant Auditor, in his first communication, inferred that the increased consumption of coal, *per engine mile*, was entirely due to the use of Transvaal coal. Transvaal coal was estimated to have a lower evaporative efficiency, as compared with Natal coal, of approximately 9.3 per cent. The Assistant Auditor then made a theoretical deduction from the figures of consumption, per engine mile, when using Natal coal and Transvaal coal respectively, and stated there was a loss to the Administration, by the alteration, of approximately £7,559 *during the period of six months*. In reply, I stated that the deduction made by the Assistant Auditor was incorrect, as he had assumed that precisely the same classes of locomotive had been employed in both periods, whereas ten of the heavier, or 10th class passenger locomotives had been introduced into working, south of Touws River, during the period in which Transvaal coal was used. (These heavy locomotives consume, on an average, 26 per cent. more coal, per engine mile, than the 6th class). In support of this, I furnished figures from actual results, which showed that the 10th class locomotive, using Natal coal, consumed 68.03 lbs., whereas, when using Witbank coal, the consumption was 73.68, or an increase of 5.65 lbs., equal to 8.3 per cent. In reporting to the Board on the Coal Contracts, the greater evaporative efficiency of the Natal coal was estimated at 9.3 per cent., and therefore in place of a loss, a saving of 1 per cent. was affected so far as the 10th class engines are concerned, and the results confirmed the calculation. Attention was also drawn to the fact that in his assumption the Assistant Auditor had figured on a rate of one-ninth of a penny, per ton, per mile, for the conveyance of the coal over the Natal Lines. This figure, by load comparison (480 tons) obtained on the Natal lines, does not represent the cost of haulage to the Administration, and, therefore, could not possibly be employed when one-ninth of a penny was charged on the Witbank section, where the maximum loads of 1,600 to 2,000 tons are obtained. The Assistant Auditor again reported to the Board on the 24th February, and stated that had my calculations been based upon a comparison of the consumption of the 6th class engines in the two periods, the result would have been very different, and maintained that his former contention was correct. In reply to this I have to state that my sole reason for not selecting the 6th class engines for comparison was the fact that these engines, during the two periods in question, were not performing the same class of work. By the introduction of 10th class locomotives a considerable number of 6th class locomotives were transferred from passenger to goods train working. Locomotives employed on goods trains occupy 50 per cent. longer time in comparison with a passenger train for the same distance, and, conversely, when employed for the same number of hours, perform approximately two-thirds of the mileage of a passenger train. It is, therefore, obvious that with the same engine mileage a goods train must show a much heavier consumption per engine mile. For that reason a comparison of all 6th class locomotives, before and after the introduction of Transvaal coal, was not made, as such a comparison would have been misleading. The 10th class passenger locomotive was performing precisely the same class of work and on the same section of line from January to September, 1911—in the first three months of which Natal coal was used—and on his account, would afford a fair test as to whether or not the additional consumption was in excess of what was anticipated, viz., 9.3 per cent., for after all this is what the Auditor sought to prove. In support of the foregoing, and in order that no misapprehension may longer exist as to the justification of eliminating the 6th class locomotives for comparative purposes, I append hereunder the actual mileage and consumption per engine:—6th class locomotive, using Natal coal (July December, 1910): average mileage per engine, 16,414 miles, using Transvaal coal (April-September, 1911) 14,645 miles; average consumption per engine, Natal coal (July December, 1910) 123 tons, Transvaal coal (April-September, 1911) 152 tons. These figures show that:—(a) The 6th class engines, by reason of being transferred to slower travelling trains, have not performed the mileage they would have if employed on passenger trains, thereby increasing the consumption per engine mile, but not necessarily increasing the actual total consumption. (b) The consumption per engine has only increased from 423 tons to 452 tons, or an increase of 6.82 per cent., and again demonstrates that the use of Transvaal coal has not led to an increased consumption in excess of 9.3 per cent. In order to show, however, that the increased consumption per engine mile has not been in excess of what was anticipated, I give the following figures in regard to four of the 6th class engines employed on the Wynberg line, during the same month of each year, and doing precisely the same class of work, using the two classes of coal:—Using Natal coal, 1910: Engine mileage, 12,385 miles; coal consumed, 408 tons; coal consumed per engine mile, 65.90 lbs. Using Transvaal coal, 1911: Engine mileage, 13,300 miles; coal consumed, 465 tons; coal consumed per engine mile, 69.95 lbs. Increased consumption per engine mile, 6.15 per cent. This again demonstrates that the use of Transvaal coal is not more than was anticipated by reason of its lower evaporative efficiency. Indeed, it is less than was anticipated. Briefly then, the cause of the increased consumption per engine mile was:—(a) The lower evaporative efficiency of the Transvaal coal, for which due allowance was made in the calculation. (b) The employment of a heavier class of locomotive (consuming 26 per cent. more than the 6th class locomotive, but hauling a greater load by 30 per cent.). (c) The transfer of the 6th class locomotives from passengers to goods working—thereby reducing the mileage run, but consuming approximately the same tonnage of coal, and, therefore, showing a considerable increase per engine mile. If the Assistant Auditor had taken the last two factors into consideration his contention, I feel sure, would not have been made, and in future he should not enter upon administrative considerations unless he is acquainted with the administrative details. In addition to the foregoing I wish to state that there are other considerations which have a considerable influence upon the economic principles in the use of Natal coal conveyed by sea, as compared with the Transvaal coal overland, which the Assistant Auditor has not apparently taken into account. For example, there is the retention by the Administration of approximately £20,000 per annum that would otherwise be disbursed in sea freight; the wastage of Natal coal, as the result of the additional handlings (the handlings are actually increased by six) when conveyed by sea, resulting in a loss of efficiency; the use made of trucks from the Rand to convey coal, which would otherwise return to the Western Province empty; the better loading of trains in the direction of Cape Town, which is not otherwise obtainable by reason of the preponderance of traffic being in the other direction; and the disadvantages of dealing with coal in ship-loads, as compared with regular daily supplies. I do not propose to refer to the other points in the Assistant Auditor's memorandum, with which I disagree, as abundant proof exists, if any proof is indeed required, that the decision to haul the coal for railway purposes overland has resulted in great benefit to the Administration. I would, however, refer to the statement made by the Assistant Auditor to-day to the effect that the contracts for 1912, awarded part of the Capetown requirements to Natal collieries. It is only necessary to state in this connection that the tenders accepted are for coal conveyed overland and not by sea as is the case in the comparison under review. In conclusion I have to express the hope that if it is to be part of the Auditor's duties to question administrative policy he will at least adduce a *prima facie* case. If he cannot, then he should not impute bad business judgment. If, however, he does criticise, he must then stand or fall on his original allegations and not constantly shift his ground as his arguments are refuted. So far as the acceptance of the tenders are concerned they were referred to and recommended for acceptance by the Tender Board, of which I am not a member.

A special general meeting of the South African Institution of Engineers will be held in the Council Chamber of the Chamber of Mines this (Saturday) evening, at 8 p.m. The business of the meeting will be the election of members. Mr. H. J. S. Heather will reply to discussion on his paper entitled "Current and Power Factor in Induction Motors." Mr. A. E. Blevins will reply to discussion on his paper entitled "The Evolution of Printing and Type-setting Machines," and discussion will be continued on the following papers:—"The 'Cascade' Single and Multi-speed Motor," by Mr. M. I. Williams-Ellis; "The Margin of Safety required for Man Haulage at Great Depths," by Mr. R. B. Greer; and "The Commercial Economy of Turbine Pumps," by Messrs. H. B. Maxwell and S. Zur Nedden.

CHEMICAL, METALLURGICAL, AND MINING SOCIETY.

Proceedings at Annual Dinner—Some Important Speeches—Value of Specialisation—Government and the Investor.

THE annual dinner of the Chemical, Metallurgical and Mining Society was held at the Grand National Hotel last Saturday night. Mr. Walford E. Dowling, Vice-President, was in the chair, and there were also present: Sir George Albu, Bart., Messrs. Alex. Aiken, R. A. Alston, R. G. Bevington (Past-President), F. L. Bosqui, J. Frank Brown, M.P.C., Dr. W. A. Caldecott (Past-President), W. Calder, W. C. Carbis, J. Chilton, J. S. Cotterill, W. M. Coulter, A. F. Crosse (Past-President), W. Cullen (Past-President), G. A. Darling, Fred. H. Davis (President, S.A. Institute of Engineers), C. L. Dewar, J. M. Dixon, W. R. Eales, W. Easterbrook (President, Pharmaceutical Society of the Transvaal), Ed. Farrar, J. F. Ferguson, G. Goodwin, Dr. Grant, Jas. Gray, B. C. Gullachsen. Dr. W. A. Hendryx, Alex. Heymann, C. B. Hilliard, I. Hodges, H. J. Hofmeyr (President, Rand Pioneers), H. L. Hoon, W. Ingham, J. Irbine, W. H. Jane, Edward H. Johnson (Past-President), J. Dale Lace, A. E. Lamb, E. J. Laschinger (Vice-President), G. A. Lawson, Hy. Lea, James Lea, L. T. Leyson, James Littlejohn (Hon. Treasurer), A. N. Locke, G. J. Mackay, H. S. Mackay, T. A. Malpage, E. L. Matthews, W. McNeal, J. N. Meeser, H. Meyer, L. D. Mills, J. T. Mitchell, P. T. Morrisby, John Munro (Vice-President, Transvaal Chamber of Mines), S. Newton, A. Mackie Niven, Professor John Orr, G. S. Patterson, Dr. G. Perkins, Dr. F. Phillips, J. Moyle Phillips, R. A. Porter, J. F. Pyles, A. Richardson, J. H. Rider (President, S.A. Institute of Electrical Engineers), Fred Rowland (Secretary), C. O. Schmidt, B. C. Travers Solly, H. Stadler, Professor G. H. Stanley, A. N. Stuart, W. A. C. Tayler, A. Thomas, A. M. Thomas, D. J. Thomas, Jas. E. Thomas, D. J. Thomas, Jas. E. Thomas, Professor G. R. Thompson (Principal, S.A. School of Mines), Dr. Ritchie Thompson, J. R. Thurlow, C. Toombs, M. Torrente, F. J. Trump, Dr. G. A. Turner (President, Witwatersrand Branch of British Medical Association), A. Wagner, A. Wallace, R. C. Warriner (President, Association of Mine Managers), F. Wartenweiler, W. Waters, F. A. Westfield, H. A. White (Vice-President), J. Whitehouse, and John R. Williams (Past-President). Letters of regret for inability to be present at the dinner were received from H.E. the Governor-General, Lord De Villiers, Sir Reginald Hart, Generals Botha, Smuts and Hertzog, Sir David Graaff, Messrs. H. Burton, A. Fischer, H. C. Hull, Colonel Leuchars, F. S. Malan, J. W. Sauer, His Honour the Administrator, Sir Percy Fitzpatrick, Sir George Farrar, Sir Lionel Phillips, Senator S. Marks, Messrs. F. D. P. Chaplin, D. Christopherson, J. Cowie, W. H. Dawe, P. Duncan, C.M.G., Max Elkan, P. Ross Frames, J. G. Hamilton, M.V.O., R. N. Kotzé, and R. W. Schumacher, and the Mayor of Johannesburg.

MR. A. WAGNER.

Mr. A. Wagner gave the toast of the Society, and spoke of its educative influence. It was fairly proved, he said, how much the work of the members of the Society had contributed to the existing stability on these fields and had created a feeling of confidence, the absence of which had formerly been frequently deplored. Their sphere of work was a very wide one. They were taking a hand in educating the youth of the country, and their publications reached to the most remote quarters of the world. They had recently held an exhibition, which had served a useful purpose. The work that had been carried on was certainly appreciated in all corners of the world. Years ago they endeavoured to wrestle with the Hungarian process, and it was a great satisfaction to him last year to see some Hungarian mine managers come out to investigate Rand minerals. Their Society had had a glorious past. It had wrought, he believed, for the last sixteen years, and every year of its existence had added to its lustre. He was perfectly certain that with such a past they need have no hesitation in looking forward to the future. He wished the members of the Society every success in future years.

THE CHAIRMAN.

The Chairman, replying, regretted the absence of Mr. Sauer, as President, and, proceeding, said the constant endeavour of members of the Society as workers on these fields had been to increase the output. They claimed some measure of success. They had a membership all over the world, and their monthly meetings were well attended. There was no lack of original papers, and there was no lack of lively discussion. In these respects they were maintaining their reputations. A feature of the "Journals" Mr. Wagner had referred to was the large number of abstracts which were given of the important proceedings of other societies and from technical publications. They were spending a good deal of money on that portion of their work. Younger members would do well to follow up the proceedings and extracts, because in the "Journal" they would see matter which was not to be found in any text-book, and when they began to tackle practical propositions they would know what other people were doing and could tackle those problems very much better. The Council and the members of the Editorial Committee gave much time to the work. Members had been accused by fellow-workers from oversea in mining and gold and silver production that they were too conservative, that they did not adopt the best processes. Their accusers were really speaking without knowledge of local conditions. In any case, any new proposition that was put forward must prove satisfactory before they could ask their financial people to put any money into it. A great deal of money had been spent in testing various methods, and among those that had been successful were the Butters filter process and the Nissen stamp. In mentioning the fact that a considerable number of their members were interested in practical farming, he said that the idea of identifying the future of the Society with agriculture was due to one of their Vice-Presidents, Mr. J. R. Williams, an idea which ought to have excellent results.

THE MINING INDUSTRY.

Mr. H. A. White (Vice-President) said: When our Society, whose mouthpiece I now am, wishes health to the mining industry a real sincerity must ring through the phrases used. As a corporate body our life is bound up with the prosperity of that industry, and our proceedings have always its welfare in view. We are chemists, metallurgists and miners, and it is right to mention what each branch is doing, or has recently done, to further the cause we all have at heart. Our chemists have solved the problem of destroying the contaminating cyanide which prevented the immediate return of the residual sand direct to the mine, and this is now returning to its stopes every particle of sand derived from the rock mined a week before. They have also provided entirely new and most delicate tests to secure the absolute safety of this process; they have devised simple means for determining noxious gases in underground working places, and are busy perfecting methods for determining exactly the amount of floating dust in mine air, and so facilitating its reduction. Their share in promoting the health of the industry in the most literal sense is a most important one. Our mining members are now considering the best means for reducing the number of accidents in mines, and the discussion of this subject has produced many useful suggestions. The mining exhibition recently held by this Society was replete with safety appliances, which were fully explained in the lectures given on their use, and in connection therewith our Council has decided to offer a valuable trophy for competition among St. John Ambulance workers. Special prizes are also being offered to students for papers on mining and other subjects.. The problèms of mine ventilation have received special consideration, and especially in this direction our Society feels that the impetus given to progress is largely due to the efforts of its members. Coming to the metallurgical section, though, I feel it necessary to proceed delicately, for here a slight grievance demands expression. When asked to propose this toast I felt rather pleased, for one or two little matters occurred to me, and the duty became an opportunity. This occasion may not be quite the most suitable, but letters to the Press are somewhat discounted of late—even dangerous sometimes—and to an after-dinner speech some indulgence is always granted.

WORK OF THE METALLURGIST.

What the metallurgist has done for the industry may best be expressed by the fact that without the cyanide process and its developments on these fields four out of every five of our mines would be working at a loss, or else closed down entirely, and I am sure that the distinguished audience whose patience I am now testing would be sadly diminished in number, and the toast I am proposing would have a melancholy, if not sarcastic, sound. And the metallurgist is still up and doing; new and successful means for separation and collection of clean sand evolved in our midst are being introduced on many of our mines and ideas from beyond the seas are being turned into valuable account in the treatment of slime and of gold solutions wherever conditions are suitable. We are cutting down the area of copper required for amalgamation, we are crushing more finely and yet more cheaply, so that soon one pennyweight of gold, about one part in half a million, will represent the cost of its extraction added to the value of the residue. Yet in spite of these facts attempts have been made to treat our profession as one the mechanical engineer may pick up in his odd moments, if indeed any effort at all is required. In the annual report of one of our newer mines, where crushing has recently commenced, I find that to a mechanical engineer the entire credit for the design, as well as for the erection of the reduction plant, was given. Though I should be the last to detract from the credit due for the most excellent and skilful engineering displayed on that mine, yet I venture to surmise that its successful operation at least to some extent depends on some metallurgist whose fame was there unsung, though it is certainly not unknown to us. Now this is only typical, and I feel sure that not 5 per cent. of the annual meetings reported in our local Press have any reason given them to imagine that such a profession as that of the metallurgist has any connection with the success of their mines. Again, with what ease did a great many people fall into the error that the troubles—out of which our Far East giant is having a happy issue—were metallurgical only. Now we all know that trouble did not lie in that direction at all. Gentlemen, this is an age of specialisation—evolution is from the general to the particular—and the time has gone by when the general knowledge of all branches of science connected with mining, which is necessary for the successful control of this industry, is in itself sufficient for the practical working of all the processes required. Each branch demands a special study, and the advance of knowledge in all directions has become so great that in one branch alone can any man, however brilliant, lay claim to be an expert. Disastrous failure may accompany any ignoring of these important facts, and this has been illustrated more than once in this country.

PRIDE OF THE INDUSTRY.

Gentlemen, we are proud of our industry, and have every right to be so, and alas! every need to emphasise the fact on such suitable occasions as this. If Satan came to the Transvaal he would probably get a wire from the South warning him not to let his court make a premature acquaintance with Johannesburg, lest their morals might be contaminated. When reading the political debates one often feels inclined to wonder if the phrase "unctuous rectitude" has not too soon been forgotten in Parliamentary circles. The desire for the health of our industry is often found on the lips of Ministers, but theirs is the old-fashioned remedy of "bleeding" the patient. We believe that our way is best, and we will continue to serve this great mining industry of ours to the best of our ability. To show your approval of this course, I now call on you all to drink the health of the mining industry.

MR. JOHN MUNRO.

Mr. John Munro replied. The mining industry, he said, acknowledged the work that had been done by the Society in enabling the industry to work at a profit, because he was quite sure that a large proportion of the mines would not be worked at a profit without the research of the metallurgists of the Transvaal. The whole position of the mining industry had been very clearly put before the public by Sir George Albu, but two matters were now prominently before the Transvaal population. One was the Miners' Phthisis Bill, and the other was the Death Duties Bill. So far as the Miners' Phthisis Bill was concerned, he could only say, from the point of view of the mining industry, they had been most anxious, ever since the knowledge was obtained that dust in the mines was detrimental to the health of the workers, to alleviate the trouble. They had not had much assistance from any other source. Shortly they hoped it would no longer be called an occupational disease, but that it would entirely disappear. They were quite prepared to take their responsibilities, and they called on the Government also to take their responsibilities, because they had all been at fault. The next question was the Estate Duty Bill, which interested the foreign shareholders, and about which there was a great "to-do."

GOVERNMENT FLOUNDERING.

"I think the Government is floundering," said Mr. Munro, "and they really do not know where they are. What is the effect of frightening away foreign capital? I will put one little case before you, probably not one of the most important on these fields, but still it is one of importance. The firm with which I am particularly connected paid out dividends in 1911 amounting to £524,254. That is a small portion of the gold extracted from the mines. A very large amount in excess of that was paid in working expenses, as anybody who studies the statistics will know. Now, in contrast to that, £655,367 was paid by our firm in developing properties. Not a penny was received back in connection with that expenditure. That is only one year's work. There will be several years and larger amounts to be expended. That is only one instance of what it means if the Government frighten away the foreign capitalist from investing his capital in this country. £130.000 more money has been spent in developing the country than has been received by all the shareholders in dividends, and then they say we must tax the foreign capitalist. I think the position the Government now want to make out is most outrageous."

THE COUNTRY.

Mr. Alex. Aiken gave "South Africa," and spoke of the opportunities which South Africa afforded to intelligence, courage and perseverance. With regard to faith and hope, he knew of no community that would beat South Africa; but there was no place on the face of the earth where there was so little charity. The troubles, the difficulties of South Africa gave opportunity to all.

Mr. H. J. Hofmeyr's response was characteristically humorous and pointed. It took the form of an appeal to the races not to depend on things coming out all right themselves nor to think that they would come right in five minutes. They must tackle one great problem at a time, and avoid confusion and lack of thought. This was a fine country, but there was something wrong with their heads. Something had occurred in the last few weeks, and yet of all who had joined in the fray how many had enlightened ideas on the subject? He dispersed the idea that other countries were better than South Africa, but he said that the country wanted every one of its people. There was no escape door. They had to stay, and if there was a fire to put it out.

Mr. E. J. Laschinger proposed "The Guests," and Mr. J. Dale Lace and Mr. R. C. Warriner responded.

MINING PROGRESS IN GERMAN AFRICA.

Particulars of the Gold, Diamond, Tin, Copper, and Asbestos Mines of German East and South-West Africa.

The annual reports for 1910-11 just published by the Imperial German Colonial Office on the German protectorates in Africa and the South Sea contain a great deal of interesting information regarding mining in those territories. In East Africa, it is stated, gold mining in Sekenke by the Kironda Gold Mines Company has made very satisfactory progres. In the Muanza district, too, at least one gold mine has reached the producing stage on the property of the late Central African Mining Company in Nyansamo, which has recently been acquired by a newly-formed company. The ore reserves on that property are stated to be abundant in quantity, and satisfactory as regards metal contents. Some other goldfields have been taken up in the Nyansamo district and development work has been started, but, so far, no gold has been produced. Mica mining in the Ulugaru district has progressed satisfactorily, the output of the old mines showing a material increase against preceding years, while some new mines have been started. German South-West Africa and the diamond industry there still constitute the main centre of interest in German mining circles. During the year under review the hope of discovering some main pipe which might be the original source of the alluvial diamonds found in the territory induced many prospectors and others to go in for very extensive exploratory work. In the Malla mountain district (province of Gora), for instance, twenty new claim groups were taken up, and—owing to rumours that on the farm Amalia, near Gibeon, a diamond had been found—very active prospecting work was carried on. But, while it is stated that to judge by the result of the prospecting operations, the ilmenites known as carbons are rather frequent real diamonds have hitherto not been found. The number of companies formed in German South-West Africa is stated to be 131 but of that number 24 entered into liquidation during the year under review; 10,398 prospecting claims were pegged off, against 9,926 in the preceding year. The labour question offers considerable difficulties. Most of the mines are suffering under scarcity of boys, and especially of skilled labourers. The main recruiting source is the district of Ovambo, but the boys there will not, as a rule, contract for more than six months, the consequence being that the composition of the labour contingents has constantly to be changed, and an unconscionably large number of raw boys is always in training. This reduces the aggregate efficiency of the labour contingents very considerably, and makes working costs very high, though the individual wages rate is low. Besides, the Ovambo boys' power of resistance against the climatic influences in the coast districts where the diamond fields are situated is very low, but cases of illness resulting in death—which used to be very frequent—are now diminishing. Copper mining in South-West Africa continues to attract considerable attention. The Otavi Mines and Railway Company has during the year under review introduced the pillar system of mining, which appears to have given satisfactory results. Stoping was mainly conducted on the 2nd level, where 16,220 tons of ore were raised, and on the 3rd level, which produced 15,491 tons. Open-pit mining produced 4,908 tons. The Otavi Exploring Company discovered a payable copper deposit in the Otavi Valley, and started development work. Operations at the Kham mine were not of a productive nature, but mainly concentrated upon the development of the copper ore lode and a newly-discovered copper zinc ore lode. In the Oljozongati mines the deposits under exploitation have been nearly exhausted. Only 412 tons of copper ore were raised, but it is stated that towards the end of the year under review new rich and extensive lodes have been found. On the Sphinx property exploration and prospecting work on the gold-carrying copper ore lodes has been continued, but no definite and reliable information regarding their payability is as yet available. Nor have the operations at the Onjati mine produced any definite results. The prospecting expedition sent out by the South-West Africa Company northwards up to the Okawango is not stated to have made any important mineral discoveries. South of the Otavi Valley conglomerates similar to those of the Witwatersrand, and apparently bearing the same geological character, have been discovered. Regarding the gold-carrying copper and iron ore finds made on the property of the Kaoko Land and Mining Company, no reliable information can as yet be given, nor is anything definite stated regarding the results of the prospecting and exploration work on the property of the South African Territories. Auriferous quartz has, however, been discovered near Kuibis, and, in consequence, many prospecting claims have been pegged off, these including six for the German Government, but the payability of the deposits is still a matter of uncertainty. Auriferous copper ore lodes near Abib are now being exhaustively explored on behalf of the management of the Khan mine. Regarding the results of the boreholes for coal started by the South African Territories, Limited, near Keetmanshoop no information is available, but the hand-diamond drills used by the Gibeon Coal Syndicate near Mariental had at the end of the year under review gone down to a depth of about 170 m. without penetrating anything valuable except a few coal chips. Very active exploration and prospecting operations have been carried out along the tin ore deposits in the Erongo mountains, and the occurrences have been traced far down into the Namib up to the Brand mountain. New, and in part very encouraging, discoveries were reported near Okombahe, Neinis, Ameib, and Onguati. Among the large companies now engaged in prospecting for tin special notice is due to the South-West African Mines Syndicate, the Ameib Exploration Company, and the De Beers Company. The last-named company intends starting regular mining operations in the near future near Okombahe. In view of the very large area over which the tin occurrences in the Erongo hills extend, the report expresses hopes of a prosperous tin industry. Asbestos has been found in several places, but apparently it belongs to the little valuable tremolite kind. It is, however, specially stated that the Colonial Mining Company has taken up a group of asbestos claims near Kolmanskuppe where, according to officially assayed samples, the mineral is comparatively good serpentine asbestos. Further development work has, so far, not been commenced.

YEAR WITH GENERAL MINING AND FINANCE CORPORATION.

Financial Depression causes Depreciation of £36,000,000 in Rand Shares.

The report of the General Mining and Finance Corporation, Limited, for the year ended 31st December, 1911, to be submitted to the meeting on 7th June, at Johannesburg, states that the profit for the year, after deducting administration expenses, depreciation of office furniture, etc., and certain mining ventures written off, amounted to £46,956, to which has been added the unappropriated balance from the previous year of £269,183, making the total unappropriated profit £316,439. This has been dealt with as under: Amount written off stocks and shares, etc., £281,292; addition to house property reserve, £15,000; leaving to be carried to the balance sheet £20,147. The usual practice has been followed of taking the share and stock holdings into the balance sheet, either at cost or at or under the Stock Exchange making-up prices current at the date the accounts were made up, whichever is the lower. The abnormal depression which has prevailed in South African mining shares during the year has necessitated the writing down of the share investments by the large amount shown above. The aggregate book cost of the share investments, as shown in the balance sheet, is less than the valuation at market prices at the end of the year; but of this unrealised profit no account has been taken, and in no case has an asset been written up. There is also an appreciation in the value of mining properties above the cost at which they stand in the books. The reserve against possible loss in respect of advances against security and sundry debtors stands at the same figure (£140,000) as in the previous balance sheet, and is more than sufficient to cover the deficiency between the market value of the securities held and the amount of the advances made, as well as the unsecured debts on which the possibility of a loss may exist. The past year has been one of financial depression in respect of South African mining securities, and European political and local economic conditions have contributed largely to this position. A considerable reduction in the market price of mining shares has to be recorded. A calculation of the difference between the prices ruling at the end of the years 1910 and 1911 shows that in the aggregate Witwatersrand Gold Mining shares experienced a drop of about 30 per cent., representing approximately £36,000,000. This has also affected the holdings of this corporation, from which it has, in consequence, been necessary to write off an exceptionally large amount. Such a state of affairs is liable to create alarm in the minds of those unacquainted with the real position of things, but past experience on these fields has proved that periods of depression have stimulated the introduction of reforms and economies, and are invariably followed by sounder and healthier conditions. There is no reason to assume that history will not repeat itself in the present instance.

FINANCES OF THE CENTRAL MINING CORPORATION.

Points from an Important Report—Diamond Interests—Efforts to Improve Labour Recruiting.

The report of the Central Mining and Investment Corporation, Limited, for the period ended 31st December last, presented to the meeting this week, states that the Corporation's share capital stands at £5,100,000, having been increased from £3,600,000 in accordance with the resolutions confirmed at the extraordinary general meeting on 6th June, 1911. Of the 125,000 shares created of a nominal value of £12 each, 80,278 were issued for the purchase of shares and other properties under agreements dated 2nd May, 1911, at a premium of £3 5s. per share; the balance of 44,722 shares were issued at par for cash. The agreement formerly existing between this Corporation and Messrs. Wernher, Beit and Company has been cancelled, and, as reported to the extraordinary general meeting held on the 19th May, 1911, a payment of £85,522 has been made to that firm in settlement of all claims up to 31st December, 1910, as from which date the reorganisation of the Corporation became operative. The realised net profit for the eighteen months ended 31st December, 1911, which was largely derived from dividends on investments, after deducting all outgoings, shows a balance to credit of £446,837. Investments stand in the books at average cost or under. The directors have made provision to the extent of £450,000 against depreciation of assets. In arriving at this figure all shares are taken into account at prices quoted per end December, 1911, Settlement, and unquoted securities have been carefully valued by the directors. Interim dividends of 10s. per share and 6s. per share have been paid on the capital ranking for the time being, respectively, for the periods ended 31st December, 1910, and 30th June, 1911. The directors regret not to be able to recommend the payment of a final dividend for period ended 31st December, 1911, owing to the heavy depreciation of assets which has had to be provided for. This decision was published as soon as the making up of the accounts had been sufficiently advanced to enable the directors finally to review the position of the corporation as at the date mentioned. The amount to credit of reserve fund remains at £100,000. The appropriation account shows a balance of £67,201, being the unappropriated balance of profit and loss account carried forward. The premium of £3 5s. per share on 80,278 shares already referred to, and amounting to £260,903, has been transferred to appropriation account. The Diamond Syndicate has entered into a new agreement covering a period of years with the De Beers Consolidated Mines, Ltd.; the Corporation's interest in the venture continues to yield satisfactory returns. The dividends distributed for 1911, however, show a shrinkage as compared with 1910, due partly to the gradual exhaustion of the ore reserves of outcrop companies, partly to re-investments of profits in extensions of plant and development. A number of companies which have started crushing operations have not yet reached the dividend-paying stage. Reports on the labour position tend to show that the number of unskilled coloured labourers available in South Africa for work in the mining industry at the present moment, though considerably increased, does not yet fully meet requirements. Unfortunately, also, the efficiency is still unsatisfactory. The directors trust that the efforts which have been repeatedly made to obtain united action on the part of the various firms interested in South Africa, with a view to improving the efficiency and reducing the cost of recruitment, will be successful.

According to the report of the Diamond Regie of South-West Africa for the year 1911-12, there were exported from Swakopmund and Luderitzbucht nineteen consignments of diamonds, to a total of 816,296 carats, which were sold by the Regie. Of the 816,296 carats, 94·55 per cent. went to Antwerp, 0·66 per cent. to London, and 4·79 per cent. remained in Germany. In the total output fourteen South-West African companies took part, the five biggest with 96·32 per cent. Out of the net profit for the year 1911-12 a dividend of 10 per cent. will be paid. The output of the United Diamond Mines at Luderitzbucht amounted to 2,480 carats in March, against 2,075 carats in February.

ANGLO-FRENCH EXPLORATION PROSPECTS.

No Dividend owing to Unfavourable Market Conditions.

The year has been a very unfavourable one for the business of the Anglo-French Company, as not only have political events and other extraneous influences been inimical to financial business as a whole, but things have happened within the Rand mining industry itself which have seriously shaken public confidence. The inevitable consequence has been that a further general decline in values has taken place which has materially affected the market value of the Company's holdings. From the annual report we learn that the estimated amount of depreciation as at 31st December on the book cost of the company's investments since the commencement of the year is £239,965 18s. 3d., out of which £27,024 10s. 1d. may be regarded as realised losses. This latter sum your directors have included in the amount written off the profit and loss account, and after careful consideration they decided that ample provision would be made for the remainder of the depreciation by setting aside the reserve fund of £150,000 and leaving approximately £63,000 to rank against the amount carried forward. The directors are glad to be able to state that the improvement which has occurred since the end of the year has justified this policy. The profit and loss account shows a credit balance of £24,150 3s. 1d., after writing off the sum of £34,297 19s. 1d. in respect of realised losses mentioned above, and sundry other amounts. This balance has been placed to the credit of the appropriation account for the year 1911, together with the amount of £73,184 12s. 4d. brought forward from the previous year. To this account has also been transferred the £150,000 from reserve fund, as already stated, against which has been written off for depreciation the sum of £149,468 12s. 1d. After providing for the dividend on the preference capital, which has been duly paid, there remains an amount of £67,866 3s. 4d., which the directors have decided to carry forward to next account. In the circumstances the directors regret they cannot recommend any dividend on the ordinary shares for the year. The customary valuation of the assets of the company was taken at the end of the year, when prices were practically at their lowest. This valuation showed the total assets of the company, after providing for all liabilities, to be £1,004,393 7s. 3d. These assets may be classified as follows:—£336,905 in cash or its equivalent, £133,258 in temporary investments in high-class securities, £28,653 in loans and debentures, £214,837 in shares yielding dividends, £290,737 in properties and shares in companies which have not yet reached a dividend-paying stage. It will be seen from the above that, notwithstanding the adverse conditions which have prevailed, the company's capital is intact, whilst an amount equal to the preference capital is held in cash assets and high-class securities. With reference to the amount of £290,737 held in properties and companies which have not yet reached the dividend-paying stage, this includes holdings which stand in the directors' valuation at the sum of £124,625, which are expected to enter the dividend-paying stage in the course of the present year. The company's investments appear, as usual, in the balance sheet in the aggregate at or under cost, after making allowance for amounts written off at different periods. No list of holdings is given this year. As has been explained to the shareholders on different occasions, it is not to the advantage of the company that these particulars should be given regularly every year. Mr. William Frecheville, one of the directors, visited Johannesburg during the year on behalf of the company. He was favourably impressed with the properties in which the company has its principal interests, and the information he was able to give to the Board upon his return has been of great advantage to the company. The Rand industry, as a whole, was somewhat disappointing in 1911: 2,455,717 tons more were crushed, but the average yield dropped from 28s. 6d. to 27s. 11d. per ton; costs rose from 17s. 7d. to 18s. per ton, and the dividends declared £7,763,086) showed a falling off of £1,112,999. This falling off was largely due to the continued great scarcity of native labour and its increased cost, as well as to capital expenditure; otherwise it is safe to say that further progress would have been shown. The number of natives employed on the gold mines at the 29th February, viz., 190,320, shows an increase of 886, as compared with the corresponding date last year, which is very disappointing in view of the many extensions of work in progress, but it is to be hoped that the Union Government will assist the mines in obtaining the labour that is so badly needed for the progress of the industry. With regard to the company's investments in Australia, these have suffered during the year in common with the rest of the mining market, and in some instances the depression has been accentuated by labour troubles and the low price of copper. Since the end of the year, however, there has been a marked improvement, owing to the advance of the price of copper and other causes, and the directors anticipate that, taking these investments as a whole, a satisfactory profit will be made. The directors are following closely any new fields which may seem to them to offer suitable opportunities for doing business.

Mine Air.

Both mine officials and mining students will welcome the publication of a work on "Methods of Air Analysis," by Dr. J. S. Haldane. It is not claimed to be a complete treatise on gas analysis: it is specially designed to meet everyday needs in connection with the analysis of air and comparatively simple gas mixtures. This is certainly one good feature of the book, and another consists in the fact that we have here a description of methods which Dr. Haldane himself has designed and proved to be of practical utility for general physiological and hygienic purposes. The distinction between such a work and a highly-technical work on scientific gas analysis is great, for there is no limit to the delicacy and refinements of the methods that can be employed in gas analysis, most of which would be too elaborate for common use in the mine or factory, where the main object is often confined to the determination of the composition of air from the point of view of the standards of ventilation demanded by Government regulations. An interesting portion of Dr. Haldane's book is that dealing with the recognition and determination of small proportions of carbon monoxide in air. The coloration test showing the percentage saturation of hæmoglobin with carbon monoxide is fully described, and curves are given illustrating graphically the relation between the percentage of carbon monoxide present and the percentage saturation in the case of the blood of mice and human beings. It appears to be possible to detect as little as 0·007 per cent. of the gas, and the blood test is claimed to be about five times as delicate as the oldest spectroscopic test.

E. J. MOYNIHAN,
CONSULTING ENGINEER.
PLANS, SPECIFICATIONS, REPORTS AND ADVICE, MINING EQUIPMENT, STRUCTURAL WORK AND FINANCIAL ADVICE.
10, ANGLO-AUSTRIAN BUILDINGS. Box 2061.

RAND GEOLOGY.

Mr. J. S. Olver Replies to Dr. Mellor's Criticism—Vigorous Defence.

THE response to my challenge on the subject of the Rietfontein area has, up to the present, been somewhat disappointing. Dr. Mellor himself can as yet go no farther than to say, "I see no great improbability in the view advocated by Mr. Olver that the Rietfontein area may include (among other elements) a faulted portion of the Main Reef series." This is a cautious pronouncement, though the parenthesis, "among other elements," is not a very effective safeguard, seeing that the admission that any part of the Main Reef exists at Rietfontein will at once establish the truth of my contention but he has hedged it about with other reservations. He continues, "At the same time I certainly see no striking similarity between the Rietfontein Reef and the nearest occurrences of the Main Reef series, and especially between the South Rietfontein Reef and the Bird Reef." Now, I was very careful not to base my correlation upon any special resemblance to the "nearest" occurrences of the Main Reef series, but relied upon the reproduction of the general characteristics of that series as observed in a variety of mines from Roodepoort to the Van Ryn. As to the Bird Reef, I should be interested to know whether, since I made my first contribution to this discussion, he has re-examined the "South Rietfontein series," noting the special features to which I referred, and has tried to find the resemblance between these features and those exhibited in the Bird Reef on the Main Reef West property, to which I called special attention.

Again he says, "And when it is further necessary to assume a six mile thrust westwards along a fault line in order to explain the similarity of the Rietfontein Reef to those of the Eastern Rand, more evidence than that offered by Mr. Olver seems to be required." Well, I think anyone who has paid me the compliment of examining my reasoning will recognise that I certainly did not "assume a six mile thrust . . . . to explain the similarity." The suggestion of thrust was based on two distinct sets of evidence secured respectively in the East and West Rand, and I merely remarked that this thrust would satisfactorily account for the resemblance That resemblance is so striking that Dr. Mellor can hardly fail to see it now that it has been pointed out to him, and it will be interesting to see how he himself explains it. The suggestion of thrust still seems to me to be founded on very strong evidence, but in my contribution to this discussion I purposely ignored this part of my case and expressly stated that I preferred to rely mainly on the visible characteristics of the Rietfontein series. As to more evidence being required, the arguments advanced in my paper, added to those in my book, seem to me to be so strong that, until they have been fairly met, I have no wish to add to them.

It seems a pity that Dr. Mellor cannot come to a conclusion on a point so important and so definite as this, if only because, if he could once accept a view in which, he admits, there is "no great improbability," he could afford to ignore the criticism of those who dispute the reality or magnitude of the faulting to the south of Rietfontein.

I wish to point out that, unless either my hearing or my memory has failed me, Dr. Mellor's answer to me, which would appear from the Proceedings to have been made at the meeting on March 18th, was not really given at the meeting. I presume that it was handed in in writing at some later date. I make no complaint as to this procedure, but it should be understood that Dr. Mellor's remarks were not an impromptu reply, made on the spur of the moment, but may be taken to represent his considered opinion.

Turning to Dr. Mellor's criticism of my general reading of Rand geology, I think anyone who reads his criticism without studying my book for himself is likely to receive the impression that my geological work is mainly done "in the air" and that I have a habit of avoiding difficulties by allowing my imagination to soar beyond the realms of material and inconvenient facts. Dr. Mellor may not have intended to convey it, but in any case anyone who takes the trouble to make even a cursory examination of my arguments and of the field over which I have worked must realise that that impression is entirely false. If I had published only the fourth chapter of the second part of "Faults and Dykes," and left out the first three chapters, Dr. Mellor's criticism might have carried conviction. The last chapter was admittedly speculative, and it was intended mainly to supply a feasible explanation of the mass of fact and observation, and of inference from observed facts, contained in the first three chapters—to serve as a key map to show the relation of the detailed maps of separate areas to each other. If Dr. Mellor succeeded in destroying the whole of the argument in that last chapter, but failed to undermine the first three chapters, he would still find enough of solid fact and argument left to make a total wreck of his own theories.

Dr. Mellor says, "The main point led up to by his study and exposition of local geology—the probability that is of the existence of an extensive body of the Main Reef series to the north-east of Rietfontein. . . . ." Now I publicly withdrew this part of my reading about a month after the publication of my book, and I repeated my recantation in my first contribution to this discussion. There would, then, appear to be no real need for Dr. Mellor to refer to this abandoned theory, unless he wished to remind his hearers that my judgment is not infallible. But that surely is a work of supererogation? In any case he shows a very curious misconception of my work in saying that that theory is the main point in it. The whole value of the work, if it has any value at all, consists in establishing the true relation of the Main Reef series to the Lower Witwatersrand System. Dr. Mellor and I have, in fact, been working over the same area with an identical object in view—to determine the original relation of the beds of the Witwatersrand System to each other. I had formed the opinion that the popular conception of that relation was largely wrong, and that this error had led and was still leading to economic disasters of two kinds—causing very large sums of money to be spent in the pursuit of imaginary reefs in the Lower Witwatersrand System, and preventing the discovery or recognition of the Main Reef series outside the relatively small portion of the Witwatersrand area contained between the Nigel on the east and Randfontein on the west. The theory of the extension of the Rietfontein reefs was a mere offshoot, and its failure does not in any way detract from the value or soundness of my general reading.

A single quotation is sufficient to indicate a singular failure on the part of Dr. Mellor to realise the strength of my case. He says, "Mr. Olver's correlation of the Coronation shale, west of Maraisburg, with the Contorted Bed, and his consequent identification of the Coronation quartzite as the Hospital Hill quartzite, are *of course* the basis of his reading of the geology of the whole of the country to the west, including the Witpoortje section, and influence his conception of the behaviour of the faults in that district." The italics are mine. Now, it would be just as reasonable to say that the celebrated foundation stone in the Market Square is the sole support of our new municipal buildings. The above correlation is only one of a very large number of points—some more and others less important—which together form the broad base of my general theory.

Dr. Mellor says, "I know of no reason, nor does Mr. Olver make clear, why his Witpoortje fault should be brought along the strike of the formation from near Roodepoort to Parktown——." Are we to infer from this that Dr. Mellor admits the correctness of my tracing of this fault as far east as Roodepoort? Whether he does so or not, the visible evidence of duplication caused by this fault seems to me to be irrefutable, and the same evidence of duplication—given in detail in my book—enabled me to follow its course without doubt or difficulty past Florida. I admitted some uncertainty as to its farther course eastward, but stated that there were strong suggestions of longitudinal faulting along a continuation of this course as far as Parktown West. Proof of the existence of this fault in the Witpoortje district and of its continuation along the course indicated by me as far eastwards as Florida is, however, all I want for the purpose of establishing this part of my general reading. Dr. Mellor therefore does not disturb me in the least when he continues, ". . . and still less why it should be further prolonged through the granite area to the north and come into play on the north side of Rietfontein." I will deal with this point again, but I wish for the moment to refer to the Orange Grove fault.

To quote Dr. Mellor again, "In a similar way Mr. Olver's Orange Grove fault is taken for many miles through the granite area, where outcrops are exceeding rare, without any evidence being adduced in favour of such a course." Here, too, he attacks the shadow and not the substance. It must be obvious to every student of this question that the main purpose of my work will be achieved if I can prove the existence of the great duplication along the course of the Orange Grove fault from the Witpoortje Gorge to the neighbourhood of Maraisburg. Realising the importance of this, I devoted many pages to the statement of my argument, supporting it by such a mass of detailed evidence that I was seriously afraid of wearying my readers. Whether my argument will stand the test of criticism yet remains to be proved, but few will, I think, deny that my case is, *prima facie*, so strong that it demands earnest consideration. Yet Dr. Mellor has completely ignored all this evidence. He has, in his second paper—which was read some days after he received a copy of my book, and a longer time after he was cognizant of the general outlines of my theory—adopted this part of the course of the Orange Grove fault for his "Rietfontein fault." He therefore cannot dispute the correctness of my tracing so far, since he appears to have made an independent discovery of this part of the fault. As to its continuation eastward, the large duplication of the Orange Grove quartzites on the farm Waterval 79, which is a conspicuous feature of Dr. Mellor's map, seems to me to be most readily accounted for by a natural extension of this fault. Dr. Mellor's theory, so far as I can see, does not explain this duplication, unless we are to accept the improbable suggestion that it is caused by a local fault, nearly transverse, which does not disturb the remainder of the Lower Witwatersrand System.

Dealing now with Dr. Mellor's criticism of the supposed continuation of this fault and of the Witpoortje fault through the granite, an examination of my book will show that I did not in any way suggest that there was visible evidence of their presence along their possible course through the granite. What I did was to give the local evidence at Rietfontein of the presence of two longitudinal faults, each with a heavy downthrow to the north—and I think Dr. Mellor will admit that this local evidence is strong enough to stand by itself—and then to point out that, since a direct extension of the observed course of the Orange Grove and Witpoortje faults would bring them close to Rietfontein, and since two faults of similar strike and action had been shown to exist at Rietfontein, it was not unreasonable to suppose that they were the same two faults. I still maintain the reasonableness of this supposition, but I have not at any time placed any weight upon it. In fact, so far as the *bases* of my general theory are concerned, it does not matter a straw whether this suggestion be accepted or not. What does matter is the proof of the existence and effect of these faults in the West Rand, and it will be seen that Dr. Mellor's criticism does not even come within the range of my position there. When Dr. Mellor goes on to say, "and when it is necessary to make the faults in their course through obscure country intersect, as do Mr. Olver's Orange Grove and Witpoortje faults on Bedford Farm, apparently in order that they may have their proper throw in the new area, it is not surprising if a feeling of mystification is induced," he certainly induces a feeling of mystification in me, since I know nothing whatever of any such necessity.

Turning now to the North Rand fault, I might meet my critic in the same way by holding only my fortified positions in the West Rand and at Rietfontein, but in this case I am confident that I can maintain my whole line. It seems impossible that anyone who examines the course of this fault, in the light of my evidence, from the old Saxon mine westwards to Vlakfontein, can have any doubts as to its existence or character. Not only can a succession of well defined beds on its south side be seen to butt at right angles against the bed on its north side, but—a very unusual thing in my experience of surface examination on the Rand—several members of this series of parallel faults can be actually seen (if it is ever logical to say that a fault can be actually seen) and the effect of their drag downward to the north is distinctly visible. Dr. Mellor again discreetly avoids the unassailable position, and says, "This North Rand fault in the same way is brought for many miles along that particular zone which runs north of, and parallel to, the Main Reef (corresponding to the horizon of the Jeppestown beds), which is almost everywhere so covered with overburden that there is practically no possibility either of proving or disproving the presence of a big fault on this line." This statement, coming as it does from a professional geologist, astonishes me beyond measure. I might take shelter behind his admission of the impossibility of disproving the presence of the fault, but I shall not adopt an attitude of passive defence.

Does Dr. Mellor intend to maintain that the existence of a fault can never be proved unless the fault can actually be seen? Surely it is a commonplace in geology that the course of a fault is frequently marked on the surface by a zone so covered by overburden that it is impossible to see the fault. The existence of such a zone is easily explained in either of two ways: The action of the fault, by fracturing the country, may assist erosion, and thus lead to the existence of low-lying ground along its course; or, the fault may adopt the line of least resistance offered by the softer beds, such as those which underlie the Main Reef series. In either case it is very unlikely that the fault will be actually visible. That does not, however, render it impossible to prove its existence.

Let me restate my argument briefly. I will assume that my evidence of the existence and course of the fault (or series of faults) at and to the west of the Saxon has been accepted. I argued that the conditions visible there can be most readily explained by the assumption of a very large thrust movement on the fault. Much evidence is given in "Faults and Dykes" to prove that such movements are most common on the Rand, and it is pointed out that it is only reasonable to expect that any fault with a large thrust movement will persist for a long distance. It is therefore very unsafe to assume that the fault dies out near the east side of the Saxon. The natural course of the fault is along the valley referred to above. In order to escape from this valley it must break through the beds either to the south or to the north. In the former case it must pierce the Main Reef series, and there is no evidence of the presence of such a series of faults along the line of outcrop of the series. I have endeavoured to prove also that there is no visible loophole of escape for the fault to the north. There is an excellent exposure of many beds on the north side of the valley all the way from the Saxon to Johannesburg, and I can find no evidence in them—either in displacement of the beds, drag or general fracturing of the country—of the passage of such a series of faults.

Dr. Mellor may dispute my premises, but it is hard to believe that he fails to follow my argument. To use a simple illustration, let us suppose that he is standing in a position which commands both ends of a railway tunnel; that he has seen a train enter the tunnel and has assured himself by careful watching that it has not emerged from it. Would he not accept his observation as proof that the train was still in the tunnel? It is true that the train might meet with disaster within the tunnel, and it would not, therefore, be safe to assume that it would come out again as a train; but supposing that, after a due interval, he saw a train come out of the tunnel, composed of the same number of trucks and of a character generally similar to that which he had seen enter the other end, would he think it an unwarrantable flight of fancy to suppose that it was the same train?

Yet that is analogous to the case of the North Rand fault. Its natural course, hedged in by prominent outcrops on either side, leads it to the western end of the Bezuidenhout Valley, and there a series of faults emerges whose effects are admitted by the main body of geologists, including Dr. Mellor. Those effects are readily attributable to a fault of the character of the North Rand fault. The further course of the fault to the east is not effectively hedged in on the north side, but a direct continuation of it would take it to the south of Rietfontein. Dr. Mellor admits the existence of a series of faults there, and he has independently identified them with those which cause the duplication in the Bezuidenhout Valley. He differs from me as to the nature of this faulting, but if my reading of the position at Rietfontein is to be accepted—and it is as yet unassailed—the evidence of identity between the North Rand fault and the faults to the south of Rietfontein become enormously strong, because it would appear that the conditions at Rietfontein could only be produced by a movement of the same nature and direction as that assigned to the North Rand fault from evidence secured in the West Rand. Further, Dr. Mellor himself shows in his sections that the apparent distance between the Government Reef series and the Main Reef series in the central area is nearly double that between the same series at Witpoortje. This would be at once explained by the existence of the North Rand fault in the valley between the outcrops of the two series in the former area.

It will, I think, be recognised that there is a great deal more to be said for the suggested course of the North Rand fault than would be inferred from a mere reading of Dr. Mellor's criticisms. I repeat that all his criticism has been aimed at the shadows and not at the substance of my work. If he wishes to make his criticism effective—either constructively or destructively—let him turn his attention to the first three chapters of the second part of "Faults and Dykes," and, for the present at any rate, neglect the fourth. I withdraw nothing in that chapter, beyond what has already been abandoned, and I still think that it will eventually be found to provide a reasonable explanation of the facts and inferences given in the preceding chapters. It will, however, be sufficient for the present if those facts and inferences can be established. No attack on the superstructure can have any material effect upon these foundations; and if, on the other hand, the foundations can be destroyed, the superstructure will fall to the ground.

As to the north eastern extension of the Rietfontein reefs, I am, of course, sorry that I was led into a mistake, but, even here, I think I may fairly console myself with the words of the old song, "I feel I'm in excellent company." The mistake was caused chiefly by the belief that the Orange Grove quartzites outcropped at Zuurfontein; and this mistake was the more natural in my case, seeing that my faith in the existence of the Main Reef at Rietfontein made it so much easier for me, than for the previous observers who had made the same mistake, to accept the occurrence of what appeared to be a portion of the Lower Witwatersrand System so far away from the Main Reef outcrop in the East Rand.

So much for Dr. Mellor's criticism of my work. I should not, perhaps, have taken it so seriously, if a general impression had not appeared to prevail that my reading demanded for its acceptance too severe a call upon the imagination—that I had pressed into my service a series of faults, bewildering in their complexity and startling in the magnitude of their movements, the sole evidence of whose existence was the offspring of my inventive fancy. Nothing could well be farther from the truth. The faulting involved is in reality comparatively simple. It is true that the estimated movements are greater than any which I have been able to measure in the mines, but the difference is only of one degree. The largest thrust movement which I have definitely measured in the mines is one of 1,400 feet, but I have reason to suspect that some of the more important faults have much greater movements than that.

Dr. Mellor grants that I have made a very careful study of faulting "on the scale on which such disturbances are met with in Rand mining," but he doubts my qualification to treat of "similar phenomena on a regional scale in dealing with Rand geology." Now, this attempt to divide the Rand longitudinally into two distinct sections, and to maintain that one of them is not subject to the same dynamic conditions or amenable to the same rules of faulting as the other, seems to me to be both arbitrary and illogical. On his own showing, the Main Reef series and the Lower Witwatersrand beds are integral parts of the same geological system, and they are included in a total thickness of a few thousand feet. It is inconceivable, then, that the Main Reef series has not felt the incidence of the compressive, tensile or shearing forces which, if Dr. Mellor's observation is sound, have had such profound and widespread effects upon the structure of the Lower Witwatersrand System. I grant that, as Dr. Mellor suggests, the Main Reef series, forming, as it does, the base of a very large mass of quartzites, may have been better able than the lower beds to resist these forces; but the extensive fracturing illustrated by innumerable faults and dykes along the whole length of the Rand, and the intense folding—some of which is assuredly on a "regional scale"—clearly prove that its resisting powers were very imperfect. Several of the faults and dykes met with in the mines have been traced for many miles, and there is every reason to believe that some of them would extend at least the full length of the area which has yet been dealt with by Dr. Mellor. How much farther must they go before they become "regional" in their effects? Might not the forces which proved themselves capable of breaking through such enormous masses of the harder formation be also equal to causing an extensive movement to supervent along the fractures? The latter task seems to be by far the easier.

No student of faulting can deny that faults have a tendency to take the line of least resistance, and it is only reasonable to expect that the greatest effects of longitudinal faulting would be observable in the less resistant beds below the Main Reef series. It was partly for that reason that, when I had once become familiar with the great thrust movements which have had such important effects upon that series, I was not much surprised to find evidence of still greater movements in the Lower Witwatersrand System. But it is easy to show that some at least of these greater "regional" faults have not spared the Main Reef series. I take it that Dr. Mellor will admit, as I believe all other geologists of standing do, that there is an enormous break in the continuity of the Main Reef outcrop near Witpoortje, and I imagine that this disturbance would be classed by him as "regional." If that be so, he would certainly appear to have set too narrow limits to the sphere of influence of the regional forces. More than that, if the Rietfontein reefs are to be accepted as belonging to the Main Reef series—and Dr. Mellor sees "no great improbability" in this correlation—then his own "Rietfontein fault" has broken its bounds and strayed into the upper beds.

It seems to me to be altogether unreasonable to suppose that forces of such stupendous power can have been developed in, or that their influence can have been confined to, a comparatively small part of the total thickness of the Witwatersrand System. Even if such a proposition were not contrary to general probability, the whole weight of local evidence would be against it. My experience of the area concerned points to a definite sympathy, both in the general lines of the main faulting and in the character of the movements, between the faults in the mines and those in the lower beds. If that be so, not only must a special knowledge of faulting be useful in the study of an area whose geology, otherwise extremely simple, has been obscured by heavy faulting, but that knowledge ought to be especially valuable when it has been gained in a continuous portion of the same geological system.

My own reading of Rand geology may or may not be correct, but I maintain that the fault movements which I have employed to explain the seeming discrepancies in this geology are entirely in keeping with those which have been proved in the parallel beds of the Main Reef series; and that though the former movements are unusually large, no one who admits the latter can argue the impossibility of the former. In fact certain admitted phenomena of the larger area can only be explained by vast disturbances of some kind or other; and I claim that the simple, though large movements which I have described offer a perfectly feasible solution of the whole problem.

Dr. Mellor complains that my work is too imaginative, but my imagination positively quails at the thought of some of the flights which are required for the acceptance of his own theories, such as the frequent entire elimination by squeezing of single beds or series of beds, sometimes amounting to thousands of feet in thickness and extending for many miles along the strike, while contiguous beds show little, if any, signs of having been subjected to the same pressure. The severe limitation of these effects to certain beds, while the beds in immediate contact with them seem to have been almost entirely unaffected—though they must, presumably, have been at least the means of transmitting the pressure—are the more remarkable in that the affected beds often appear to be among the most resistant of the series, and that some of the nearest surviving beds, such as banket reefs, are well fitted to exhibit the effects of such pressure. I do not venture to say that such effects are altogether impossible, but I do maintain that occurrences so extraordinary and so unlike the previously-observed manifestations of faulting in the Witwatersrand System are not to be accepted without much more convincing evidence than Dr. Mellor has yet advanced.

I have gone very carefully over his evidence in the field, and I hope to give the reasons for my dissent in great detail at the next meeting.

A NEW METHOD OF AGITATING SLIME.

The Parral Tank System—An Interesting Mexican Development.

Probably no other branch of the metallurgy of gold has witnessed so many and important improvements of recent years as the treatment of slime pulp. The latest innovations have been in regard to improved means of agitation—an essential performance in the successful treatment of slime.

Slime agitation forms the subject of a valuable paper by Mr. Bernard Macdonald, of Guanajuato, Mexico, appearing in the current issue of the "Transactions of the American Institute of Mining Engineers." Mexico has evolved a remarkable number of recent innovations in the metallurgy of gold, to take a single well-known instance, the Pachuca tank, which, as its name indicates, had its birth in the central American Republic, may be mentioned. Mr. Macdonald declares that the Pachuca tank system, although a great improvement over any other previously employed, has many commercial defects. He writes:—

Means of Effecting Agitation.—In the cyanide-plants built before 1907, agitation was effected in tanks 10 to 12 ft. deep, and ranging in diameter up to 30 ft., by mechanically revolving stirring-arms, assisted by centrifugal pumps drawing the settled pulp from the bottom of the tank and throwing it back on the top of the charge in the same tank. This method was fairly efficient, but expensive in both the construction and the operation of the plant; and it was superseded by pneumatic or air-lift agitation, which proved to be at least equally efficient, and much more economical. The method of air-lift agitation which came into general use in cyanide-plants is known as the Pachuca-tank system. The superior economy of air-lift agitation and the energy of the patentees of this system soon brought this method into popularity, and most of the recently constructed cyanide-plants have adopted it.

Defects of the System.—That this system was a great improvement over any other previously employed, there is no question; but that it has a number of commercial defects, is also true. All these defects result from the design of the tank, and the apparatus with which it is equipped, the tank-dimensions being at variance with all the principles governing the object (other than as stand-pipes) for which tanks are employed. The great height and small diameter make the holding-capacity comparatively small, and consequently its cost of construction per unit of holding-capacity, high. The height of the tank and the large diameter of the air-lift tube necessitate a correspondingly high pressure and a large volume of compressed air to effect the transfer of the pulp; and this adds to the cost of agitation. The pulp transferred through the air-lift tube overflows on the top of the charge, close around the tube, in which relative position the solid particles settle vertically to the bottom, where the steeply-sloping sides of the cone bottom carry them to the intake of the lift-tube, which throws them back again on the top of the charge. Under normal conditions of operation, the air-tube turns over the entire change in a Pachuca tank of standard size in about 15 min. The violence of this operation would not be necessary to keep the pulp in proper mixture; but on account of the tall, narrow tank and the conical bottom, it is necessary, in order to keep the air-lift tube and the air-nozzle from being choked. The air-nozzle within the lift-tube is a crude mechanical device, expensive to operate and expensive to maintain.

Proceeding, he claims to have designed and developed a system known as "The Parral Tank System of Slime Agitation," in which the alleged "defects in the Pachuca-tank system have been eliminated and corresponding advantages secured."

The Parral Tank System of Slime Agitation.—A complete tank equipment of this system, consisting of five tanks, and capable of treating 500 tons daily, has been installed at the milling plant of the Veta Colorado M. and S. Co., at Parral, Mexico. Besides the Parral tanks there are two standard Pachuca tanks, one of which is used as a treatment-tank, and the other for holding the wash-water for the filter-press plant. The Parral tanks, 25 ft. in diameter and 42 ft. high, are equipped with the special piping and the apparatus peculiar to this system, while one Pachuca tank is equipped with the piping and apparatus of that system. The treatment-tanks (i.e., the one Pachuca and five Parral tanks) have been piped for the individual and continuous systems of treatment, and each of these systems has been tried out, separately, a complete record of the results being carefully kept. No advantage in the extraction of values has been shown by either of these systems over the other; but the continuous system is more economically operated by reason of its great simplicity and "fool-proofness." The object of the Parral tank system of agitation is the same as that already described in reference to the Pachuca tank, but the tank-design and the mechanical equipment used are entirely different from those of the Pachuca system. The Parral tank is flat-bottomed, 25 ft. in diameter and 42 ft. high, with a capacity three times as great as that of the standard Pachuca tank. For transferring pulp from the bottom to the top of the tank, four 12-in. transfer-pipes are set 12 in. from the bottom, 4 ft. from the tank-side and equi-distant from each other. The compressed air is admitted into these pipes through a patent nozzle fitted with a ball-valve, which automatically opens and closes, intermittently, as required in the jet-feeding of the compressed air. I refer to these as transfer-pipes, this being more accurately expressive than lift-pipes, for, practically speaking, the pulp is not lifted, but transferred from the bottom to the top of the charge. In case the compressed air should fail, and in the momentary intervals between the jet-issues, the air nozzle is securely and automatically sealed by the ball falling back on its seat, and the entrance of pulp to the air-pipes is prevented. On the delivery or top-ends of the transfer pipes, tees of equal diameter are bolted, with the run in line with the pipes, and the outlets so directed as to discharge the pulp in line of segment-chords to the circumference of the tank. The discharge of all the transfer-pipes is in the same direction, and the force of the discharge sets up a spiral or rotary flow in the tank-charge which, in a short time, extends down to the bottom of the tank. When the tank is filled to within 10 or 12 ft. of the top, the air is closed off the auxiliary pipes and turned on in the transfer-pipes. The spiral flow set up in the tank carries the pulp-particles round and round, so that the distance travelled by the pulp from the time it is delivered at the top until it reaches the bottom is many times greater than if it settled vertically, as in the Pachuca tank. In other words, the solids are carried in suspension by the rotary flow of the solution as they would be carried in a flowing river; the settlement of the heavier particles is thus retarded; and, consequently, the necessity for transferring the pulp from the bottom of the tank to the top is proportionately lessened, and the cost of the work is comparatively reduced. In the Parral tank system no special diameter of tank need be adhered to as in the Pachuca system. The relation of the diameter to the height of the tank should be whatever is economical in holding-capacity, which should be the main consideration in determining tank-diameters. To secure, under this system, perfect agitation and the necessary rotary flow in tanks of the largest diameter, it would only be necessary to install a proper number of transfer-pipes, with discharge-outlets placed in the right direction to set up and maintain the rotary flow. A Parral tank of the same holding-capacity as a standard Pachuca tank, would be 15 ft. in height by 25 ft. in diameter, and would be equipped with four 8-in. transfer-pipes; while the necessary pressure of compressed air would be only 8.5 lb. per square inch.

Mr. Macdonald has presented his paper "as the announcement of a new and improved system of slime-pulp agitation, for the consideration and criticism of metallurgical engineers connected with or interested in cyanidation." Since the subject bulks very largely in local metallurgical circles, Mr. Macdonald's claims and descriptions will doubtless be accorded a good deal of attention on the Rand.

MINING IN MOZAMBIQUE COMPANY'S TERRITORY.

Official Description of Mineral Prospects in a Promising Field.

FROM the excellent Mining Handbook issued by the Mozambique Company for 1912, we take the following:—

The territory of the Mozambique Company lies between the rivers Zambesi and Luenha (also called Ruenha) on the north and the 22° of latitude south. It is bounded on the west by Rhodesia and on the east by the Indian Ocean. This vast tract of territory embraces an area of 65,637 square miles and includes an estimated length of 270 miles of coast line. This territory is held under Royal Charter by Royal Decrees of 1891, 1893 and 1897, by the Mozambique Company direct from the Portuguese State. The Charter is for 50 years from 1891 and so has still 30 years to run. At the end of that period it may also be renewed. By this Charter sovereign rights including all mining rights are vested in the Mozambique Company, which holds approximately a similar position towards the Portuguese Government as the British South Africa Company does towards the British Government. The territory of the Mozambique Company, also called the Government of Manica and Sofala, must not be confounded with the district of Mozambique which, with its capital, the town of Mozambique, lies north of the Zambesi, nor with the Province of Mozambique, which is the name given to the whole of the Portuguese possessions on the east coast of Africa. The climate of the territory of the Mozambique Company varies considerably according to the altitude. The lands along the coast and on the great coast plain are hot, but the mountainous region of the neighbourhood of Macequece, where the mines are situated, and the chain of mountains separating the territory from Rhodesia, which would appear to form the mineralised zone of the country, enjoy a climate similar to that of Rhodesia. This climate is agreeable, and there is on the whole little fever: in fact, fever does not exist on the highest hills in the neighbourhood of Macequece, where some of the mines are situated. The dry season in the mining region extends from the end of April to about November, although in some years scarcely any rain falls before Christmas—January and February are the wettest months. The average rainfall for the last four years in the neighbourhood of Macequece has been—1907, 66.43 inches; 1908, 33.11 inches; 1909, 41.99 inches; and 1910, 47.44 inches. The mineralised portions of the territory of the Mozambique Company may be looked upon as almost virgin ground from the mining point of view, as so little prospecting has been done up to the present, but in addition to the gold and copper mining region situated in the immediate neighbourhood of Macequece, the rivers in the divisions of Moribane and Mossurize carry alluvial gold, and the indications of coal, though as yet only of a poor quality, and of copper ore have been found in the division of Mossurize. The fact that most of the rivers of Moribane and some in Mossurize contain alluvial gold points to the more than probable existence of gold reefs in the frontier mountain chain from which they flow. The Umkondo copper mine is situated south of Melsetter, at no great distance from the Company's frontier, and coal has already been located not far from this border on the Rhodesian side. Even the recognised mining field of Macequece has been very insufficiently prospected, and there is every reason to believe that quite a number of payable finds will yet be made in this region. The conditions offered to prospectors by the Mozambique Company are the most liberal in South Africa, and there is no doubt that the territory of the Company offers very fair mining chances to anyone wishing to put their money into a prospecting venture. The tax on production payable to the Mozambique Company is fixed by law at 10 per cent. on the net profits for all gold propositions whose gross monthly output exceeds 800 ounces fine gold, and for all minerals other than gold. By the amended Mining Regulations recently approved by the Portuguese Government a tax on the gross output has been substituted for the 10 per cent. tax on the net profits for all gold propositions that may have a monthly production of less than 800 ounces fine gold, that is to say, of a value of less than about £3,600 per month. This tax is graduated on a sliding scale from 1 per cent. to 4 per cent., according to the number of ounces produced, the smaller production paying a lesser tax. There are no other obligatory charges payable to the Mozambique Company beyond the claim rents, which are exceedingly low. For reef propositions these vary from 10s. per claim per annum in the second year of registration to £3 per claim per annum in the seventh year. For the first year of registration no rent is payable. No charge is made for the use of water for power or otherwise beyond the cost of the licence and stamps, which is 30s. or £2, and on payment of a licence of 10s. per block of 10 claims per year as much wood as desired may be cut for mine timbering, whilst only 3,000 reis, about 12s. per horse-power per annum, is charged for wood used for boilers. It will thus be seen that the terms offered to miners in the territory are peculiarly favourable in matters of payments to be made to the Mozambique Company. On mining propositions being floated into companies, the Mozambique Company exact no portion of the vendors' shares and, with the exception of the small share in the profits mentioned above, the whole of a worker's output, be he a private individual or a company, belongs to him absolutely. Simple gold assays can be done at the Mine Department at Macequece against payment of a small fee. Assay work is also undertaken by the Bank of Africa, which has an agency at Macequece, and two of the mines in the district have their own assay offices. English and French, as well as Portuguese, are understood and spoken at the Mines Department, and all mining laws and regulations are published in English as well as in Portuguese. All notices and forms used have English translations attached or interlined. The mining field of the territory on which up to the present development has been done is that of Macequece, from which there is a regular production of gold and copper. The mining field of Macequece, as at present known, may be described as consisting of a half-circle with Macequece, situated on the diameter of the circle, and having a radius of some sixteen English miles extending eastwards, northwards and westwards. On the north and west this field extends as far as the British border, and, geologically speaking, the field is one with the Rhodesian mining field of Umtali. Extensive ancient alluvial gold workings exist on the banks of the streams in almost every river valley of the Macequece field: in some cases these workings extend for quite a distance from the present river-beds. At the Guy Fawkes or Pardy's mine ancient reef workings exist, but in no cases do the ancients seem to have worked below water level. The ancient workings often serve as a very useful guide to prospectors, but here, as in Rhodesia, the ancients undoubtedly missed a great many reef propositions; in fact, in the Macequece field they only seem to have attempted reef working in one or two instances, either because the crushing of the quartz presented mechanical difficulties which with modern appliances no longer exist, or more probably because they were indolently content to stick to the easily washed alluvials. Also the fact that in the Macequece field reefs very often only sub-outcrop, being covered by surface soil or detritus washed down from the hills, has probably, in many instances, been the reason that the ancients missed these sub-outcrops altogether, owing to their ignorance of geological conditions. Thus it happens that in the Macequece field most of the reefs are virgin reefs, as far as regards the ancients. Geologically, the Macequece field consists, generally speaking, of archaean schists, talcose, chloritic and hornblende: granite bounds the field on the north and south. Diorite, diabase and other basic igneous rocks occur in the schistose area, and granite and felsite outcrop at various points. Bars of ferruginous quartzites traverse the field in an approximately east and west direction, and the true lie of the reefs would appear to be parallel to these bars, which serve as useful "pointers" to the prospector. The reefs are quartz, though the gold is not confined to the quartz, but is also found in the schist walls. Gold has also been found on one property in quartzite, whilst on the Paradox the gold is found free in the actinolite schists, sometimes in flakes with the appearance of filigree-work. In its general characteristics the neighbourhood of Macequece is not unlike the neighbourhood of Barberton. It is made up of a group of high hills and their intermediate valleys, in nearly every one of which runs a mountain stream which in very many cases is permanent through the year. The sides of the hills are steep, and the country is thickly wooded. These circumstances, viz., abundance of water, steep gradients and abundance of timber permit of mines being worked very cheaply by affording water power for milling, facilities for mechanical or aerial haulage and fuel for steam boilers, where these are used, and charcoal for the gas engines which are now supplanting them, as well as suitable wood for mine timbering. Mining propositions can thus be worked exceedingly cheaply. The working costs of a ten-stamp tributing proposition in 1908 averaged 13s. per ton, although this mine was using steam, not water power, both for crushing and hauling, and was also paying a tribute of 7½ per cent. on the output to the owners, which is included in the above-mentioned working costs. It is difficult to give an exact estimate of average working costs, but under fairly favourable circumstances these may be taken to be about 10s. to 12s. per ton when water power is employed, and in some cases where ore is taken out of open workings, costs would not exceed 6s. or 7s. per ton. These costs did not include any cyanide costs. The majority of gold reef propositions working in the Macequece field are small workers' propositions, to whom the low working costs on the field are particularly advantageous. In addition to the gold propositions there are two copper mines, of which one produced some £22,000 worth of copper in 1909, and copper of the estimated value of £20,585 12s. 7d. in 1910. There is a considerable line of country along which copper indications are found, only a portion of which is so far pegged. The centre of the Macequece mining field is the town of the same name situated on the main line from Beira to Salisbury, and about 22 miles from Umtali, the Rhodesian border town. At present some four goods trains in each direction pass Macequece daily, by which passengers can also travel. There is a bi-weekly mail in each direction from Beira to Salisbury, to which is attached a restaurant car and on which sleeping accommodation and every convenience is available. As the distance from the port of Beira is only 183 miles, railway freights are nothing like as high as on most of the other mining fields of South Africa, which are situated farther from the coast. Rates for mining machinery, iron, steel goods and timber were considerably reduced in 1905 and since then the timber rates have been further reduced. Mining machinery and material and explosives are free of any duty, and for dutiable articles destined for Macequece and entering the territory by the port of Beira there is a specially reduced custom charge of only 5 per cent. on the original purchase price of the goods. There are several stores in Macequece where light mining material, such as spades, picks, wheelbarrows, etc., are kept. And at Umtali, which is the next station on the line, steel, cyanide, lubricants, ropes, mining buckets and almost any ordinary mining material can be purchased, whilst machinery of all kinds, including batteries, trucks, rails, cyanide plant, etc., can be delivered at Macequece direct from Salisbury or Durban, with no delay. There is a network of excellent roads in the immediate vicinity of Macequece, which intersect the mining area. These roads are maintained by the Mozambique Company, the rivers being spanned by iron and cement bridges, so that the roads are passable for heavy transport at any season of the year. It is thus possible, in spite of the mountainous nature of the country, to convey crushing plant to, roughly speaking, any part of the mining region. The mines are worked principally by native labour, the white men directing the unskilled work. The average native wages paid on the mines to volunteers are approximately as follows:—Surface natives, 15s.; underground natives, 20s.; underground natives who are drill and hammer boys, 20s. to 30s. The Mozambique Company allows mine owners to recruit boys for their own mines within the territory on making a deposit of 10s. per native that it is desired to recruit, of which sum 5s. is retained by the Department of Native Labour, and 5s. returned to the applicant on the registration of the native for his service. The Mozambique Company, in order to aid mine workers, also undertakes at present to itself furnish native labour, and has constituted a special Department with this object. The Company cannot guarantee the experience or qualifications of these natives, but every effort will be made to allot the natives as far as possible to that kind of work to which they may have been accustomed. Two months' notice must be given of the number of natives required, and applications for natives for a lesser period than four months can only be entertained in exceptional cases. One month's wages for these labourers must be paid in advance at the time of making the application. The following rates are at present in force for natives supplied for mine work by the Mozambique Company:—Natives recruited from without the territory: Surface work and pushing trucks in drives, 4,725 reis (or 21s.) per month; Other mining work, 7,875 reis (or 35s.) per month. Natives recruited from within the territory (applied for four months or more): Surface work and pushing trucks in drives, 4,275 reis (or 19s.) per month; Other mining work, 7,425 reis (or 33s.) per month. Natives recruited from within the territory (applied for four months or less): Surface work and pushing trucks in drives, 4,725 reis (or 21s.) per month; Other mining work, 7,875 reis (or 35s.) per month. These prices include all fees. Natives supplied by the Mozambique Company to the mines are recruited for periods of six months or more, and should the same have been recruited from without the territory, they are, as a rule, recruited for the period of a year. On the whole the native labour supply for mining work is sufficient, but in the months October to December when the natives go to their kraals to sow their crops there is usually, as elsewhere, a shortage more or less marked. The following figures show the value of the output of the Macequece field in the last five years:—1906, fine gold £9,590 2s. 3d., copper, £172 16s.; 1907, fine gold, £10,881 5s. 7d., copper, £2,588 12s.; 1908, fine gold, £14,549 5s., copper, £3,495 17s. 8d.; 1909, fine gold, £16,235 11s. 8d., copper, £22,111; 1910, fine gold, £26,491 17s. 10d., copper, £20,585 12s. 7d.; total value fine gold, £77,748 2s. 4d.; total value copper, £48,953 18s. 3d.

(To be continued.)

MINING MEN AND MATTERS.

Messrs. Bayliss and Pickering, of the Goldfields Rhodesian Development Company, paid a visit to the Rand this week.

* * * *

Mr. R. G. Pearson, M.I.M.E., who lately left Rhodesia for a trip home, is now on his way to report on some tin properties in Malaya for a London house. He will probably return to London via Burma in August next.

* * * *

We regret to announce the sudden death, at the age of 73 years, on 15th April, of Mr. Robert Hudson, senior partner and founder of Robert Hudson & Sons, the well-known firm of truck and wagon manufacturers, Gildersome, near Leeds.

* * * *

The monthly meeting of the Geological Society of South Africa was held in the Council Chamber of the Chamber of Mines on Monday night, Mr. H. Kynaston in the chair. Mr. J. S. Olver read a paper in reply to the one by Dr. E. T. Mellor, entitled, "The normal section of the lower Witwatersrand system on the Central Rand, and its connection with West Rand sections." One new paper was read, namely, "Iridosmine from the New Rietfontein Mine; its analysis, occurrence and genesis," by Mr. C. Baring Horwood. The reading of a paper on "Topography and Geology of the German South Kalahari," by Dr. Paul Range, was postponed.

* * * *

The Chemical, Metallurgical and Mining Society will meet in the Lecture Theatre, S.A. School of Mines, Eloff Street, this (Saturday) evening at 7.45. The agenda includes the following papers for reading and discussion:—"Notes on Dust Determination by Filtration through Sugar," by Mr. A. McA. Johnston, M.A.; "A New Apparatus for Sampling Air from Dust," by Mr. E. J. Laschinger, B.Sc.; and "A System of Keeping Underground Costs and Records," by Mr. C. Hildick Smith, B.Sc. Reply to discussion: "Accidents in Transvaal Mines, with Special Reference to Falls of Ground," by Mr. J. Chilton. Continued discussion: "Some Observations on Ancient Mine Workings in the Transvaal," by Mr. T. G. Trevor. Reply to discussion: "Notes on Absorption of Gold by Amalgamated Copper Plates, Cast-iron Retorts and Amalgam Trays," by Prof. G. H. Stanley and Mr. M. T. Murray, M.Sc. Continued discussion: "Zinc Dust Tests," by Dr. W. J. Sharwood; a contribution to the discussion on this paper will be read by Mr. M. Thornton Murray. For discussion: "The Luminator Purification Treatment of Water for Steam Boilers," by Mr. William Cullen; contributions to the discussion on this paper will be submitted by Messrs. F. J. Pooler, W. Alexander and M. Thornton Murray. "The Action of Mineral Sulphates and Arsenates on Cyanide Solutions," by Mr. Andrew F. Crosse. The sixteenth annual general meeting of members will be held on Saturday evening, June 22, at 7.45. In accordance with the constitution and rules, it will be necessary for all nominations for officers and Council of the society for the year 1912-13 to be in the hands of the secretary not later than May 23.

His many friends will be sorry to hear of the death of Mr. Carl Wiese, an old pioneer of Portuguese and British Central Africa, in Berlin, Germany, after a long and lingering illness. Mr. Wiese did good work for the North Charterland Exploration Company, Limited. He was the original founder of the North Charterland Exploration Company, and it was the concession arranged by him with native chiefs that formed the basis of the present company's concession of 10,000 square miles, which was taken over by the late Mr. Cecil Rhodes in 1895. Afterwards, for many years, he was one of the leading traders and planters in Nyasaland and at Chiromo, where he had his headquarters, and was widely known for his unbounded hospitality and kindness of heart. To many a man "down on his luck" he has extended a helping hand. Later on the Portuguese Government, in recognition of his service at the time of the Mataka Expedition and also at the time of the demarcation of the Anglo-Portuguese boundary, generously granted him large prazos and concessions, comprising the very large tract of land between the Luia River and the Nyasaland and Northern Rhodesia boundaries. Here he made his headquarters called Chifumbaze, once an old fort and mission station some hundred years ago, round which were many ancient gold workings. Energetic attempts were made to find continuation of the reefs, and much prospecting and mining work was done and a five-stamp battery and the necessary buildings, etc., erected. Here also in Chifumbaze, as in Berlin and Nyasaland, his hospitality was unbounded, and he was much liked by all. Later on bad health compelled him, after being about 30 years in the country, to make frequent visits home, where he died, to the great regret of his many friends.

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IRIDOSMINE FROM THE NEW RIETFONTEIN MINES: ITS OCCURRENCE, ANALYSIS AND GENESIS.

[By C. Baring Horwood, B.Sc. (Lond.), A.R.S.M., M.I.M.M., Assoc.M.Inst.C.E.]

Introduction.—Iridosmine has been described as an alloy of iridium and osmium in variable proportions.[1] Probably a better definition would be that it consists of an intimate mixture of the two, which generally contains some ruthenium and sometimes a little platinum, chromium, gold and palladium.[2] Such a mixture is generally accompanied by one or more of the less rare elements as impurities, which may be removed by treatment with aqua regia.[3]

Occurrence.—Several years ago Mr. Andrew F. Crosse[4] discovered platinum and iridosmine (more often the latter), in the Rand bankets. He first noticed it associated with the gold at the Modderfontein mine and afterwards at the East Rand Proprietary mines. At the latter he found as high a percentage of iridosmine as 10 dwts. per ton, in the black sands from the stamp batteries. He has also seen it associated with the Black Reef at Klerksdorp. Quite recently he found as much as 9 dwts. per ton in battery concentrates (black sands) from a Klerksdorp property. Years ago he found it in the banket reef, which immediately underlies the diabase, at the Steyn's Estate mine.

The first to actually publish an account of such an occurrence on the Rand was Professor R. B. Young.[5] He mentioned it as being obtained from the crushed ore of the Du Preez series at the New Rietfontein mines in quantities too small to be of commercial value; and describes it as probably an original constituent of the banket, occurring in rounded and flattened grains and in tabular six-sided rhombohedral crystals, both averaging in diameter about 0.12mm. A very impure sample had a specific gravity of 17.9; and on treating for osmium he obtained results which showed that this element was present in considerable quantity.

The writer examined, under the microscope, samples from the Rietfontein mines and from the Klerksdorp district, and found that they were decidedly crystalline in character.

Having been technically connected with the Rietfontein mines in 1907 and 1908, it seemed to the author worth while to study the occurrence a little more closely. These mines are situated about nine miles to the east of Johannesburg and about five miles north of Germiston. Their underground workings extend for a distance of about one and three-quarter miles in an east and west direction parallel to the strike of the banket beds.

At that time the percentage of free gold recovered at these mines (that is the gold which can be recovered by amalgamation) was over 60 per cent. of the screen value.[6] The iridosmine occurs in minute quantities associated with the gold. It has not been recognised in situ underground or in hand specimens of the reefs; but in panning rich samples of ore it is sometimes noticed as occurring in small grey particles at the extreme end of the tail of gold; and, it was sometimes impossible to thoroughly separate the two in the pan owing to their specific gravities being so nearly alike.[7] From the panning of numerous samples it would seem that the iridosmine occurs mostly in what is known as the Carbon Leader, a very narrow banket reef, varying in thickness from a mere streak up to 2 or 3 inches, rich in gold and in which the gold is invariably associated with carbon.[8]

The iridosmine was collected from the battery concentrates, or black sand residues, and die sands. The black sands that were separated from the plate dressings were daily put into the ball mill; and once a month the accumulations from the latter were put into the Berdan pan, where they were treated for about 48 hours, and afterwards the iridosmine was separated from these concentrates by panning; being the heaviest metal it remained in the pan until the last. The quantities in which it occurs are too small for it to be of other than scientific interest: thus it took several months to collect even 1,000 grains of the mineral.

Analysis.—Towards the end of 1907 the author brought a small quantity with him to England.[9] This sample had been heated with aqua regia to free it from any impurities such as iron, or amalgam, collected during its treatment in the stamp battery. Dr. W. J. S. Lockyer[10] was kind enough to have this subjected to a spectroscopic analysis at the Solar Physics Observatory, South Kensington.

Silver poles were used; and the elements found to be represented in the spectrum were the following:—

Elements.	Remarks.
Ruthenium	Lines very strongly shewn.
Osmium	Do. do.
Iridium	Certainly present, but lines not very strong.
Rhodium	Probably present, but cannot establish definitely without a spectrum of increased dispersion.
Platinum	Possibly trace of some of the strongest lines; but its presence is very doubtful.
Iron	Lines moderately strong. These occur also in the silver pole spectrum, but are stronger in the spectrum of the sample plus silver poles.
Calcium	The lines of these two elements are a little stronger in the spectrum of the poles plus sample than in that of the silver poles alone. The elements probably occur in minute quantities.
Aluminium	
Chromium	Lines fairly well shewn.
Titanium	Faintest traces of strongest lines.
Silicon	
Magnesium	
Palladium	Trace of strongest lines, apparently.

The above elements are arranged in the order of the strength of their lines in the spectrum.

The following forty four elements were sought; but there was no evidence of their presence:—

Antimony, Arsenic, Barium, Bismuth, Caesium, Cadmium, Cerium, Cobalt, Copper, Erbium, Europium, Gadolinium, Gallium, Holmium, Indium, Lanthanum, Lead, Lithium, Manganese, Mercury, Molybdenum, Neodymium, Nickel, Praesodymium, Potassium, Niobium, Radium, Rubidium, Samarium, Scandium, Strontium, Sodium, Thorium, Tin, Thulium, Tungsten, Thallium, Tantalum, Uranium, Vanadium, Wisconium, Yttrium, Ytterbium and Zinc.

As previously mentioned, the material had already been heated with aqua regia at the mine laboratory; and, this treatment may have eliminated all trace of some of these latter elements, even if originally present.

From the above it would, at first sight, seem that the substance consists principally of osmium and ruthenium with only a little iridium. Iridium lines are, however, generally weak, so that there might be more iridium present than one would infer from the weak lines in the spectrum, and this was subsequently shown to be the case.

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[1] Mineralogy by F. Rutley, 10th edition, p. 226. The Data of Geochemistry by F. W. Clarke, p. 607.

[2] Vide loc. cit. also the Geology of Ore Deposits by Thomas and MacAlister, pp. 31 and 406; History of Chemistry, Ernst von Meyer, 3rd English edition, pp. 433 and 434; the Data of Geochemistry by F. W. Clarke, pp. 18 and 19.

N.B.—Platinum, iridium, osmium, ruthenium, rhodium and palladium constitute the platinum group of metals.

[3] Since iridium and osmium in a fine state of division are themselves somewhat soluble in aqua regia, the mixture should only be treated sufficiently long with this reagent to dissolve out any of the impurities which may be present.

[4] Personally communicated.

[5] Notes on the Auriferous Conglomerates of the Witwatersrand, by R. B. Young, Trans. Geo. Soc., S.A., Vol. X., 1907.

[6] By "screen value" is meant the value of the ore treated as obtained from the sampling and assay of the pulp leaving the battery screens. For the fourteen months ending February, 1908, the average percentage of gold recovered by amalgamation was about 64 per cent. of the screen value.

[7] The specific gravities, *when pure*, of gold, iridium and osmium are 19.3, 22.7 and 22.5 respectively. The two latter generally contain impurities and so their specific gravities are reduced and thus more nearly approach that of gold.

[8] For a description of the Rietfontein reefs see "The Mode of Occurrence and Genesis of the Carbon in the Rand Bankets," by C. B. Horwood, Trans. Geo. Soc., S.A., Vol. XIII., 1910.

[9] The writer wishes to take this opportunity of thanking Prof. Wm. H. Merrett for his kindness in taking charge of the samples and interesting Dr. Wm. J. S. Lockyer in the matter after the author had left for South Africa.

[10] With the sanction of the Director (Sir J. Norman Lockyer).

Usually the presence of quantities far too small to be detected by the chemist is quickly and easily detected by a spectroscopic examination.

A spectroscopic analysis is especially useful in certain cases, such as this one, in which the presence of rare elements can be detected quickly and with certainty. However, it is well to bear in mind that it is only qualitative; for example, some elements although present in very minute quantities may give strong lines, while others which are present in larger quantities may give quite weak lines. This depends on whether the element is easily vaporised by the heat of the electric arc, or, in other words, is better able to carry the current, in which case the lines will be relatively strong. It approaches a little to quantitative methods in the case of a differential analysis in which the spectrum of a substance containing a known quantity of an element is compared with that of another substance containing an unknown quantity of the same element when some idea of the relative quantity present can be formed.

On the author's return to the Transvaal early in 1908 he sent another sample weighing 910 grains to England. Dr. Lockyer very kindly had further very careful spectroscopic analyses made from portions of this sample, for which much larger quantities of the material were taken. Silver poles were again used; and the result is shewn below:—

Elements.	Remarks.
*Osmium	Lines very strong.
*Ruthenium	,, very strong.
Iron	,, fairly strong.
Chromium	,, rather weak.
Calcium	,, rather weak.
Aluminium	,, rather weak.
Strontium	,, rather weak.
Titanium	,, rather weak.
Sodium	,, rather weak.
*Iridium	,, rather weak.
Magnesium	,, weak.
Manganese	,, weak.
Vanadium	Slightest trace of strongest lines.

No trace of Platinum, Potassium or Silicium.

The elements are arranged according to the strength of their lines in the spectrum; and asterisks have been placed against those elements of which the substance is, probably, mainly composed.

This second analysis bears out the main features of the first one. The amount of iron present in each case is probably chiefly due to iron from the stamp shoes and dies of the battery.

N.B. A plate illustrating the spectra obtained in the above analyses will be published with the next issue.

(*To be continued.*)

QUARTERLY REPORTS.

Neumann Group.

MAIN REEF WEST.

The report for the quarter ended March 31st states: 120 stamps (73·34 ran), two tube mills and cyanide works; 42,765 tons milled; total working costs, £48,300 7s. 9d., equal to 22s. 7·065d. per ton; profit for quarter, £23,683 9s. 4d., equal to 11s. 0·913d. per ton. No allowance has been made in the above figures for interest on debentures, or for the Government tax on profits. The capital expenditure was as follows: Shafts, £10,133 14s.; buildings, machinery and plant, £7,242 6s. 8d. Recovered from all sources employed per ton milled, 8·038 dwts. fine gold. Feet driven, risen and sunk for the quarter, 2,264. Of 1,998½ feet driven, risen and sunk on Main Reef Leader, 1,591 feet were on reef, averaging 5·7 dwts. over 48 inches. 216 feet have been sunk and timbered in No. 5 shaft, making a total depth to date of 2,685 feet. Payable ore reserves, December 31, 1911, 670,890 tons; ore developed for quarter, 51,410 tons; total, 722,300 tons; less ore mined for quarter, 48,674 tons; less difference in stoping width, 6,854 tons; total, 41,820 tons; payable ore reserves as at March 31st, 1912, 680,480 tons. The erection of crushing and sorting station and steel bins has been completed. Alterations to mill bins and steel trestle work have also been completed, and all rock is now transferred to mill in 40-ton hoppers by heavy locomotive.

WITWATERSRAND DEEP.

The report for the quarter ended March 31st states: 245 stamps, four tube mills and cyanide works; 112,540 tons milled; total costs, £108,641 1s. 1d., equal to 19s. 3·68d. per ton; profit for the quarter, £43,622 15s. 6d., equal to 7s. 9·03d. per ton; total revenue, £152,263 16s. 7d., equal to £1 7s. 0·71d. per ton. No allowance has been made in the above figures for interest on debentures or for the Government tax on profits. The capital expenditure was as follows: Shafts, £2,580 12s. 9d.; buildings, machinery and plant, £8,820 17s. 4d. Recovered from all sources employed per ton milled, 6·46 dwts. Total development footage for quarter, 2,088·5 feet. Payable ore available on December 31st, 1911, 1,436,202 tons; payable ore developed during quarter, 20,258 tons; total, 1,456,460 tons; less ore stoped from payable blocks, 84,504 tons; payable ore reserves on March 31st, 1912, 1,371,956 tons. There is practically no water coming into the 14th level; at the 15th level the water is much decreased, and at the 16th level, where the inrush took place in October last, the pressure is now reduced to 95 lbs. per square inch from its initial figure of 240 lbs. The amount of water pumped for the quarter was 176,819,144 gallons. Since the end of the quarter, the crosscut at the 15th level has intersected the reef at 240 feet south of the water-dyke, and driving east and west on the reef for 65 feet has shown an average assay value of 11·7 dwts. over 57 inches.

CONSOLIDATED MAIN REEF.

The report for the quarter ended March 31st states: 120 stamps (87·07 ran), three tube mills and cyanide works; 54,759 tons milled; total revenue, £80,899 4s. 5d., equal to 29s. 6·568d. per ton; total working costs, £59,054 4s. 8d., equal to 21s. 6·825d. per ton; profit for quarter, £21,844 19s. 9d., equal to 7s. 11·743d. per ton. No allowance has been made in the above figures for the Government tax on profits. The capital expenditure was as follows: Shafts, £8,788 3s. 7d.; buildings, machinery and plant, £5,237 13s. 5d. Recovered from all sources employed per ton, 7·056 dwts. fine gold. Total development footage for the quarter, 3,844½ feet. Ore reserves, December 31st, 1911, 581,450 tons; ore developed for quarter, 74,353 tons; total, 655,803 tons; less ore mined for quarter, 62,019 tons; less difference in stoping width and Main Reef mined but not shown in reserves and from stopes previously called unpayable, 9,846 tons; total, 52,173 tons; ore reserves, March 31st, 1912, 603,630 tons. 176 feet have been sunk and timbered in No. 3 shaft, making a total depth to date of 1,447 feet. Owing to an improvement in the native labour supply, three shifts are again employed on this shaft, and progress should now be satisfactory. The erection of the mechanical stokers at the mill boiler plant is completed, with results fully up to expectations.

KNIGHT CENTRAL.

The report for the quarter ended March 31st states: 120 stamps (106·61 ran) and cyanide works; 70,950 tons milled; total revenue, £76,295 19s., equal to £1 1s. 6·08d. per ton; total costs, £67,958 1s. 1d., equal to 19s. 1·88d. per ton; profit for the quarter, £8,337 17s. 11d., equal to 2s. 4·20d. per ton. Capital expenditure: Shafts, £3,704 6s. 7d.; buildings, machinery and plant, etc., £1,956 8s. 2d. No allowance has been made in the above figures for the Government tax on profits. Recovered from all sources employed per ton milled, 5·15 dwts. fine gold. The west shaft has been sunk 195 feet to a total depth of 4,007½ feet, or to 68 feet below the 13th level station, and timbered 155 feet to 3,880 feet. The sinking of the east shaft was recommenced at the end of the quarter. During the quarter the shaft has been cleaned up, and 20 feet of sills put in to a depth of 4,083 feet. Total development for quarter, 2,394 feet. Exclusive of main crosscuts, ore passes and prospecting work, 1,782½ feet, or 74·46 per cent. of the development work, has been on reef. Altogether 1,700 feet have been sampled, the average value being 4·79 dwts. over 54·84 inches. This total comprises 915 feet, or 53·8 per cent., averaging 1·89 dwts. over 55·57 inches, and 785 feet, or 46·2 per cent., averaging 8·26 dwts. over 54 inches. In this latter total is included 290 feet of Main Reef at 9·99 dwts. over 54·66 inches, 45 feet of Main Reef Leader at 9·66 dwts. over 41 inches, and 450 feet of South Reef at 7·04 dwts. over 54·88 inches. Payable ore exposed as at December 31st, 1911, 644,300 tons at 6·04 dwts. over 60·56 inches; payable ore exposed or developed during quarter ended March 31st, 1912 (see note), 26,660 tons at 6·03 dwts. over 60·24 inches; total, 670,960 tons at 6·04 dwts. over 60·54 inches; less ore mined from payable blocks during quarter ended March 31st, 1912, 47,660 tons; total ore reserves at March 31st, 1912, 623,300 tons. Note.—In addition to the 26,660 tons mentioned above, approximately 19,500 tons of ore classifiable as payable have been developed by the 11th, 12th and 13th levels, but as these drives have been in the west shaft safety pillars, the tonnage has not been included in the ore reserves.

New South Wales Diamonds.

Mr. Daniel Grove has made a most glowing report to the New South Wales Premier on the occurrences of diamondiferous ground near Inverell, in that State.

THE WEEK IN THE SHAREMARKET.

Quiet and Sagging—Some Hopeful Reports.

Reports of the four leading finance and investment corporations of the Rand appear in this issue, and it will be seen that all agree that the depression has been overdone. All, moreover, appear confident that the market will, at no distant date, find out its mistake and hasten to rehabilitate Rand stocks. Locally, business has been very dull during the week. Randfonteins appear to have had a check. Little business is doing in any division. Tins are stagnant, if a trifle firmer, and diamond syndicates are lifeless. Hope is still expressed that the one or two Rhodesian stocks dealt in here may have a spurt, but at the moment these hopes seem vain. The Wit. Deep meeting was very satisfactory, and Mr. Dawe's speech should have a good effect in London. On the other hand, Mr. F. Eckstein's speech on the other side was none too cheerful, though, all things considered, it was as good as could be expected. The Exchange here was closed on Thursday, affording a sufficient excuse for a holiday week.

* * * *

	Friday, 10th.	Sat., 11th.	Monday, 13th.	Tuesday, 14th.	Wed., 15th.	Thurs. 16th.
African Farms ...	17 6	17 6B	17 6	17 3B	16 9B	...
Adair-Usher Process	1 0B	...	...	1 0B	1 0B	...
Apex Mines ...	36 0B	–	38 6B	40 0S	38 0B	...
Bantjes Consolidated	24 3B	25 0	25 0	24 6B	24 3B	...
Benonis	6 4B	6 3	6 3B	6 1B	6 4B	...
Bushveld Tins ...	1 7B	1 3	1 8	1 4B	1 6	...
Brakpan Mines ...	68 6B	...	69 0B	69 0B	70 0B	...
City and Suburban ...	51 0B	52 0	51 3B	51 9B	51 9B	...
City Deeps	56 0B	56 0B	53 0B	56 0B	55 0B	..
Cloverfield Mines ...	6 5	6 4B	6 7	6 6B	6 6	...
Cons. Langlaagtes ...	22 9B	24 3	23 0	23 0B	23 3	...
Cons. Main Reefs ...	20 3	20 3	20 0B	20 0B	20 0B	...
Coronation Freeholds	...	0 8B	0 8B	0 8B	...	...
Con. Investment ..	21 6B	21 6B	21 9B	21 0B	21 3B	...
Concrete Cons. ...	10 6	10 0B	10 0B	10 0B	10 0B	...
Crown Diamonds ...	...	...	5 0S	...	...	...
Clydesdales	11 0B	11 0B	...	...	..	..
East Rand Cent. ...	9 0	8 9B	8 9B	8 9B	8 9	...
East Rand Coals ...	2 6B	2 6	2 6B	..	2 5B	...
East Rand Deeps ...	...	...	–	3 9S	...	...
East Rand Props. ..	64 0B	64 3B	63 9B	63 3	63 0	...
East Rand Deb. ...	£94	£95	£95	£94	...	...
Eastern Gold Mines	...	1 10B	2 0S	1 10	1 10	...
Govt. Areas... ...	26 0	23 3B	26 6B	23 9	26 6B	...
Glencoe (Natal) Colls	6 9B	...	6 9B	6 9B	6 9B	...
Glynn's Lydenburgs	27 6B	28 0B	28 6B	28 6B	30 0S	..
Glencairns	4 0B	4 3B	4 0B	4 0B	4 0B	...
Ginsbergs	27 6B	...	...	...	...	...
General Minings ...	23 0S	21 6B	21 0B	23 0S	23 0S	...
Jupiters	...	...	...	13 6S	12 6B	...
Kaalfontein Diamonds	0 8B	0 8B	0 8B	0 8B	0 9B	...
Klerksdorp Props. ...	3 5B	3 6B	3 6B	3 4B	3 5B	..
Knight Central ...	15 5	15 6	15 9	15 3B	15 3	...
Kleinfontein Estates	27 6B	...	27 6B	27 6B	27 6B	...
Knights Deeps ...	...	50 0B	...	45 0B	...	..
Lace Props.	3 9	3 9S	3 9S	3 3B	...	...
Lydenburg Gold Farms	8 10B	9 0	9 1	9 0B	9 1B	...
Luipaardsvlei Estates	..	10 0S	9 0S	..	6 0B	...
Main Reef Wests ...	28 0B	28 6B	28 6B	28 0B	28 0B	...
M.R. West Deben ..	£100	£100	£100	...	£98	..
Modder B's	57 0B	57 3B	57 6B	...	57 0B	...
Midas Deeps ...	0 7B	0 8B	0 8B	0 6B	0 7B	...
Middelvlei Estates...	1 11	1 9B	1 9B	1 9B	2 0S	...
Modder Deeps ...	30 0B	31 0B	31 3B	31 0B	30 0	...
New Eras	7 10B	7 9B	7 9B	8 0B	7 9B	..
New Kleinfonteins...	29 3B	...	29 6B	29 0B	29 0B	...
New Rietfonteins ...	10 6B	10 6B	10 6B	10 6	...	...
New Unifieds ...	17 6B	17 6B	17 6B	19 6B	17 0B	...
New Boksburgs ...	...	2 0B	2 0B	2 6S	2 0B	...
Nigels	17 6B	17 6B	17 6B	18 0B	...	...
Orange Diamonds ..	1 7B	1 6B	1 8	1 6B	1 6B	...

B Buyers. S Sellers.

	Friday, 10th	Sat., 11th	Monday, 13th.	Tuesday, 14th.	Wed., 15th.	Thurs. 16th.
Pretoria Cement Co.	58 0B	58 0B	60 0	59 0S	59 0	...
Paardekraal Estates	0 8B	0 8B	0 8B	0 8B	0 8B	...
Premiers Deferred	182 6B	183 9B	185 0B	185 0B	...	...
Premiers Preferred	...	...	168 0B	...	...	...
Princess	...	...	...	...	10 0B	...
Rand Nucleus ...	3 0B	3 1B	3 1B	3 1B	3 0B	...
Randfontein Estates	27 3	26 0	28 6	27 6	27 0	...
Randfontein Deeps ..	4 0B	4 0B	4 0B	4 0B	4 0	...
Rooiberg Minerals	33 6B	33 0B	33 6	33 6	33 3	..
Rand Collieries ..	...	...	...	...	...	...
Rand Klips	6 3B	6 9	6 8	6 6B	6 0B	...
Ryan Nigels ..	4 0B	4 0B	4 0B	4 0B	4 0B	...
Rood. Durban Deeps	...	...	25 0B	25 0B	...	...
Robinson Deeps ...	54 0B	54 0B	...	...	...	...
Roberts Victors ...	16 0B	16 6B	...	16 0B	...	...
Rose Deeps	67 6B	...	67 6B	...	...	...
Salisburys	2 6B	2 6B	1 0B	2 6B	...	...
Simmer Deeps ...	...	4 6S	4 3S	...	...	...
South African Lands	4 7B	4 7B	4 9	4 8B	4 7S	...
S.A. Tin Mines ...	7 0	...	7 0	...	...	...
S. Randfontein Deeps	3 2	3 6S	3 2B	3 2B	3 0B	...
Sub Nigels	6 0B	6 0	6 0B	5 9B	5 9B	...
S. A. Breweries ...	40 0B	40 0B	40 0B	40 0B	40 0B	...
Springs Mines ...	13 6B	13 9B	.	13 0B	...	.
Trans. G.M. Estates	..	47 6B	48 0B	47 6B	47 6B	...
Temple Tins ...	3 3B	4 0	4 0	4 0S	3 10	...
Trans. Coal Trusts...	43 6B	43 9B	44 0B	44 0B	44 3B	..
Tudors	2 0S	2 0S	...	.	...	..
Trans. Cons. Lands	...	...	...	30 0B	...	...
Van Ryn Deeps ...	20 9B	20 6	20 9B	20 0B	21 0B	...
Village Deeps ...	..	42 3B	42 0B	...	42 0B	...
Villiage Main Reefs	51 0B	51 6B	51 0B	..	...	...
Vogel. Cons. Deeps...	1 6S	1 2B	1 3	1 1B	1 3	...
Van Dyks	...	2 0B	2 6B	...	...	...
Voorspoed Diamonds	...	10 0B	10 0B	...	...	.
Witwatersrands ...	57 6B	58 0B	58 0B	58 0B	...	...
Wolhuters	20 9B	20 6B	20 6B	21 0B	...	...
Witbank Collieries ..	41 0B	43 0S	40 0B	40 0B	40 0B	.
Wit. Deeps	56 0B	57 0B	57 0B	57 0B	57 0B	...
West Rand Est. ...	3 3B	3 9B	3 9S	...	...	...
West Rand Con. ...	...	13 0B	...	...	...	...
Zaaiplaats	48 0B	48 9	48 6	48 0B	48 0B	...

B Buyers. S Sellers.

If a sufficient number of applicants is forthcoming an examination for mine manager's certificates will be held in Bloemfontein at the end of the month.

Situations Vacant.

Wanted Assistant Surveyor for large Mine on East Rand. Salary £25 per month.—Apply, enclosing copies of testimonials to

SURVEYOR,

c/o this Office.

Rhodesian Section.

MINING DEVELOPMENTS IN MATABELELAND AND MASHONALAND

The Position at the Hay—Progressive Gatooma—The Administrator on Mining—Operations at the Village Mine Ceasing—The Central Mining Corporation in Mashonaland—Rouge Mine Developments—The Lonely's Dividend—Amalgamation of the Rezende and Penhalonga.

It appears that what has actually been the trouble at the Hay Mine of recent months has been loss of the true reef formation. Recent returns have indicated in no mistakable manner that if this is not the case, there has been a very marked impoverishment of gold values. Despite the reticence of the Board, there can be but little doubt that the encountering of faulted ground has been the trouble. The new diamond drill which was imported for boring operations at the Giant has been despatched to the Hay, and will, presumably, be employed in testing the Hay reef in depth. The latest rumours are to the effect that an improvement is to be observed in the mine, and that an increase in output may be looked for in the immediate future, but it is difficult to ascertain the exact position at the property.

* * * *

There is probably no more progressive town and district in Rhodesia to-day than Gatooma. In five years Gatooma has been changed from a meagre collection of mud huts to a community of several hundreds of people, hotels, fine shops and stores, banks, offices, etc. Having secured a township board for the government of Gatooma's affairs, the residents are now seeking to increase the prosperity of the Gatooma district by the construction of roads to outlying mines. Any one who has some knowledge of Rhodesian mining will appreciate the vitality of the question of roads to the outlying districts and mines. Gatooma is the centre of a large number of mines, not a few of which have tremendous transport difficulties to contend with, and a movement is afoot to bring Gatooma into connection with all of these mines by means of serviceable roads. A Roads Committee appointed by residents has given the mines of the Shagari area particular consideration, and decided on a more direct route to these properties. A road to the Mabel's Luck mine has recently been completed, and the Roads Committee are now considering the question of shortening the route to the Glasgow mine.

* * * *

His Honour the Administrator had some important remarks to make on the subject of mining in Rhodesia at the second session of the Fifth Legislative Council of the country, held in Salisbury the other day. Sir William Milton remarked, in the course of his address:—The mining output for the past year has reached the highest total recorded, and should, before another year has passed, be appreciably increased by production from some of the large undertakings which have been steadily developing their properties during the past two years. A gratifying feature in regard to mining operations is the substantial decrease in the death rate among native labourers, in which respect this territory, in spite of the greater difficulties in working, will now bear comparison with the wealthy and highly-organised industry in the South. It is to the credit of the great majority of those engaged in mining that they have fully recognised the necessity and advantage of complying with the regulations which the Government have considered it necessary to enforce in regard to the care and treatment of native labourers; and I feel sure that the direct result will be a great economy in the wastage occasioned in the past by sickness and death amongst the working staff of the mines.

* * * *

The Village Mine in the Umtali district is closing down. The pumps were pulled up at the end of last month. It is just about two years since the Syndicate took the mine over from Messrs. Madgen and Spearman, giving the substantial sum of £10,000. Evidently it was a bad speculation.

* * * *

According to Salisbury advices, the Central Mining and Investment Corporation have decided to suspend all operations in Mashonaland, with the exception of work at the "Tea" Reef. It is understood that the firm's Salisbury office will close at the end of the current month. Considerable disappointment has been expressed at the abandonment of the Abercorn tin venture. It may be pointed out, however, that the Corner House have never taken a large and direct interest in Southern Rhodesian mining.

* * * *

The Board of the London and Rhodesian Mining and Land Co. received the following cablegram in mail week from the Rouge mine, giving the results of development work during March: Total footage driven and sunk, 165. 160 ft. level winze sunk 29 ft., a total of 86 ft.; reef 42 ins. wide assaying 9¼ dwts. per ton. Bottom looking well; reef is opening out.

* * * *

The Board of the Lonely Reef G.M. Co. have declared an interim dividend of 2s. per share, payable at the end of this month to shareholders registered on the 4th inst. Recent developments on the property are given in a cablegram, as follows, which was received by the Board in mail week:—No. 7 level south drive 550 to 595 ft., average width of reef is 17·55 ins., assaying 15½ dwts. No. 8 level north drive average for the first 5 ft. 53 ins., 1 oz. 5½ dwts. South drive average for the first 15 ft. 47·66 ins., 1 oz. 8 dwts.

* * * *

Amalgamation of the Rezende and Penhalonga mines has been receiving the attention of the respective boards for some while past. On account of their positions there are sound reasons for bringing about the union of these two propositions. The board of the Rezende Mines, Limited, has issued a circular to shareholders. The directors point out that the company is mainly dependent upon the Penhalonga Mines, Limited, for its supply of power, which is furnished by a 1,200 horse-power hydro-electric power station on the Odzani river, about seven miles from the two properties, and is owned by the Penhalonga Mines, Limited. For this power the company is paying some £150 per month, and, in addition, one-third of the cost of running the plant, and in the dry season the supply of power is insufficient. The company is at present erecting an auxiliary plant on the Odzani river of some 400 horse-power. Even when that is completed they will still be largely dependent upon the Penhalonga Mines plant for power. It has long been obvious, the directors state, that to fully develop the Rezende property a greater supply of power would be necessary, and the want of this has considerably delayed development in the past. In addition to the power plant referred to, the Penhalonga Mines own a modern 80-stamp mill, with crusher station and the necessary electric motors for driving same. They also own an efficient air-compressing plant, workshops, buildings, and a considerable supply of mine stores and requisites, as well as cash, bullion, and concentrates on the water, amounting to from £30,000 to £32,000. The advantages of the proposed transaction to the Rezende Company are stated as follow: The possession of ample power for all probable future requirements; increased air-compressor capacity; the acquisition of 80 stamps, with rock crushers, etc.; the acquisition of a large quantity of mining stores and requisites. The board propose, should their offer be accepted by Penhalonga shareholders, to continue running the Penhalonga mill until the ore reserves are exhausted if it is found possible to do so without loss, as by so doing standing charges will be kept low.

THE MINERAL DEVELOPMENT OF ZAMBESIA.

The Gold Fields Rhodesian Development Company Investigating—Prospects of the Muende Mine.

Mining in Northern Portuguese Zambesia has at different times of late years attracted attention, but, mainly, no doubt, on account of the distance of the properties in this district from any really practicable and useful place of export, no important developments have to this date taken place there. A few weeks ago, however, the Gold Fields Rhodesian Development Company despatched an engineer and staff of miners from Bulawayo to two properties situated in the territory of the Companhia da Zambesia. These two ventures are known as the Muende and the Barros. They are held under option by the Rhodesian Mines Trust, Ltd., for which company the Gold Fields Rhodesian Development Company are the local managers. The board of the Rhodesia Mines Trust, Ltd., had hoped to have been in the position to have carried out active development on these properties during the past year, but, owing to the prevailing market depression, decided to restrict operations as much as possible. However, it appears that there now is a likelihood of a certain development policy being carried out almost immediately. The mining districts of Northern Zambesia are of peculiar interest, not only because of the extensive old workings occurring there—workings which indicate very ancient mining—but also because of the productive possibilities of the area.

Severe Transport Disadvantages.

Northern Zambesia has, as already remarked, suffered much in the past because of inaccessibility. Chifumbaze, which is in the heart of this mining district, is a "prazo" station situated about 160 miles north of Tete on the Zambesi. The outlet for Tete is the unsatisfactory port of Chinde on the Indian Ocean, and all machinery, stores, etc., have to be carried up the river, which at times is so low that navigation is rendered impossible. Similarly all exports have to be transported down this uncertain waterway. These disadvantages have very naturally greatly hampered the mineral resources of Northern Zambesia, but no doubt if any really large or valuable mineral deposit were located means would be found to remedy the position. The projected linking up of the Shire Highlands Railway with the Beira and Mashonaland Railways will of course considerably assist the districts lying to the north of the Zambesi River, and more especially those which abut on Portuguese territory.

The Maggie's Luck and Muende Mines.

The geology and general mineral indications of this little known part of Africa, which the powerful Gold Fields Development Company are now investigating, are of peculiar interest. Probably the best known mining venture in this district is the Maggie's Luck mine. The gold occurs here in quartz in a big zone of contact metamorphism induced by the meeting of two huge granite masses. The vein matter may, in fact, be regarded as an auriferous excess of silica derived from the granite, which in many places assumes a gneissoid development. This occurrence has been exploited in an open cast quarry about 225 feet long by 75 feet broad. The property has been equipped with a 5-stamp Krupp mill (750 lbs.), workshops, stores, etc. But the results secured here have been erratic and somewhat unpromising. We understand that the venture has been idle or virtually so for some months past. Muende is a more promising concern, and the Rhodesia Mines Trust Company is no doubt well justified in anticipating that good results may be secured thereupon. Surface trenching has proved the gold-bearing formation to have a considerable lateral extent, while high values have been shown—some 25 dwts.—over the considerable width of 15 feet at the only point at which the reef has been intersected in a shaft. Muende lies four miles from Chifumbaze and consists of a large mass of remarkably hard auriferous iron pyrites. It was for some time owned by Obrist & Co.—a Chinde firm—and was also under option to Mr. Weise's Berlin Co. Trenching and "costeaning" have seemed to indicate a total length of the formation along the strike amounting to at least 1,000 feet, and there is every appearance of the existence of a much larger stretch of bold-bearing pyrite.

Other Occurrences.

Apart from Maggie's Luck and Muende, there are certain other mining properties in this territory, which will, no doubt, in the course of time attract attention and capital. For instance, the Chabuino Gold (Quartz) Mine, on the North-Eastern Rhodesian—Zambesian frontier, possesses many encouraging features. In the North-Eastern part of the territory graphite of good quality has been discovered. Nearer Tete two copper properties have been to some extent developed—the Kakanga and Pandamacuya mines. They are of low grade character, but may at some time be turned to profitable account. Scheetite (calcium tungstate) has been found at Kakanga. Coal, too, has been found at several places in Zambesia. The mining laws of the territory are liberal, and the climate is not unhealthy. With better transport facilities this huge district, which was, without doubt, a mining field of paramount importance centuries ago may again become notable.

Bucks Reef April Returns.

The following are particulars of last month's working results, viz.:—Tons crushed, 914; yield, £2,203 19s. 6d.; profit, £160 6s. 11d.

Claremont Mines.

The following are the particulars in connection with the returns of the Claremont Mines (Rhodesia) for April:—Number of days mill ran, 27; number of stamps running, 20; number of tons crushed, 2,376; number of ozs. of fine gold, 1,212·37; value of gold, £5,077 15s. 9d.; profit for month, £2,255 14s. 11d.

A Mining Case.

In the High Court at Bulawayo, Messrs. Fripp and Ballard, owners of the Ringstead Mine, in the Essexvale district, sued Mr. Devenish, a mining speculator, of Barberton, for £2,000 damages for breach of contract, £212 for 90 ft. work, and £240, the value of 60 ft. work wrongly used by him for inspection purposes. The plaintiffs contended that Devenish, for £500, was given a years' option over the property. If the option was exercised within six months the purchase price was to be £5,000 and a thousand £1 shares in any company floated, and if exercised after then, £10,000 cash. A condition of the option was that he should do further sinking and driving on a new level and keep titles afoot at his own expense. Sinking and driving were not carried out, and he declared that 90 ft. of the work had been done by the plaintiffs. When inspection fell due he then abandoned the claims before the agreement lapsed. Judgment was given for the plaintiffs.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Pilgrims Rest Mines.

To the Editor, *South African Mining Journal.*

Sir,—I am very pleased to note in your issues, from time to time, news of the Pilgrims Rest Goldfields, as I consider this district is going to play an important role in the future of the Transvaal gold industry, and it merits considerably more than the very scant notice which has hitherto been taken of it. At the same time, discrepancies are sometimes apparent, and, in this connection I wish to draw your attention to the last paragraph in the "Latest from the Pilgrims Rest Goldfields," on page 350 of your issue of the 4th inst. Your correspondent states: "The former (viz.: the Peach Tree Syndicate) also holds some valuable ground there, though not so near to the Peach Tree Mine of the T.G.M.E." Now, sir, as a member of the Peach Tree Syndicate, I wish to point out that the ground of the Peach Tree Syndicate is *immediately* adjoining that of the T.G.M.E., and its borders are within a stone's throw of the Peach Tree Mine of the T.G.M.E. No other ground can, therefore, be nearer to the Peach Tree Mine of the T.G.M.E. than my Syndicate's, and I am sending you a small sketch plan to illustrate my remarks. I shall be glad if you will, therefore, correct that paragraph in your next issue.—Thanking you in anticipation, I am, etc.,

M. HASKEL.

Pilgrim's Rest, Transvaal,
8th May, 1912.

Deep Boreholes.

To the Editor, *South African Mining Journal.*

Sir,—The article given in your issue of May 4th, in which Mr. Hoffman states that the Vlakfontein borehole was the deepest in the world, and the letter appearing in your last week's number in which Mr. Rowland Gascoyne challenges the accuracy of this statement, have interested me as a practical drill foreman very greatly. One is continually reading of several shafts and boreholes, each of which is stated to be the deepest in the world. In fact, it seems that the world possesses as many "deepest shafts" and "deepest boreholes" as it does "finest golf links" or "tallest buildings." Until the other day I had imagined that the New Chum Railway Mine (Bendigo) possessed the deepest shaft of any gold mine, with the Catlin shaft of the Jupiter, the Milner shaft of the Simmer Deep, and the Cinderella shaft at Boksburg very close up to its record. But I have just learned that the St. John del Rey mine in Brazil is deeper than any of these. Similarly with boreholes, Mr. Hoffman asserts that the Vlakfontein hole is the deepest sunk. Mr. Gascoyne, after allowing Mr. Hoffman to squeeze all the true vertical length out of his rods that he can, cites a much deeper hole in Silesia. Probably someone else knows of an even deeper hole in Arkansas, the Alleghaney Mountains, or the Andaman Islands! At any rate, it would be interesting to learn from Mr. Gascoyne whether the Czuchow borehole was surveyed, and if so, what deviation was detected. As bearing on this question, I think it worth pointing out that numerous boreholes have been put down of which no details have been published, for reasons best known to the companies concerned. To cite one instance, the Oceana Company sank a hole near Meyerton, in the Heidelberg district, some years ago. I have never seen any particulars of depth attained here or results secured, but it is generally understood that this drill penetrated to a very exceptional depth. Possibly, if data regarding this hole could be secured, both Mr. Hoffman and Mr. Gascoyne would have to contend with a new rival.—I am, etc.,

A DIAMOND DRILL FOREMAN.

Germiston, May 14.

Round vs. Rectangular Shafts.

To the Editor, *South African Mining Journal.*

Sir,—On my return from Central America, I find in your esteemed journal a copy of an article I wrote for the *Engineering and Mining Journal* of New York, and in a later number a criticism entitled "Circular vs. Rectangular Shafts: A vigorous statement of the case for the rectangular shape." The author does not sign his name, for reasons best known to himself. I do not discuss with anonymous writers, but, as you have given importance to the subject, I will take the liberty to correct some of the mistakes your anonymous correspondent has made. M.H.C. says: "It must not be forgotten that the author is an English engineer, writing to an English technical paper, and may therefore be excused if he is ignorant of the methods employed in modern rectangular shaft sinking operations." I am English, but have had no mining experience in England. The *Engineering and Mining Journal* is not English, but American, as one would expect a rectangular-shaped shaft expert to know. I quote again: "and the experimental circular shaft sinking going on at present (on the Rand) is being watched with great interest." In Europe we have long finished with experimental work in shaft sinking, and your correspondent must surely be mistaken when he says that they are experimenting with round shafts on the Rand, for how can they be 50 years in advance of European methods if they are still doing this? Is not this a contradiction in itself? M.H.C. should read a book entitled "Shaft Sinking in Difficult Cases," which has been translated from the German. In the sinking of such large shafts as described therein, I myself have been engaged in Germany, and am therefore entitled to say a word. For the readers of your journal who have not so closely followed events in Europe, I will say that on account of locating great potash salt fields in Germany a new industry has sprung up resulting in the sinking of many deep shafts for large outputs. These shafts are all circular in shape, and some have been sunk under enormous difficulties, but as far as I know, there have been no failures. The methods of sinking are the very latest and best science and experience could give, and the shafts are equipped with the most modern machinery. As regards rectangular-shaped shafts, your anonymous correspondent refers to those in Spain as "prospecting holes." Perhaps he is ignorant of the fact that Spain is the second largest producer of lead of any country in the world, and that most of this material comes from the districts where I have been actively engaged; however, I have been able to gain experience of rectangular shaft sinking in other countries. The shafts in Spain are not sunk as a rule with the object of a very large output, but at the same time some of these mines are large producers. It must, however, be remembered that my article was not written for a South African paper, nor did I make a comparison with any of the Transvaal shafts. The shafts I described in detail were small ones. I quote again from your Transvaal expert: "It is the fashion to-day, if one wishes to appear erudite, to express measurements and weights in meters and kgs., but the good old British foot and pounds will be good enough for me." It is very kind of M.H.C. to give us this valuable information, but he has forgotten that I did not write the article for a British journal. In the above lines I have purposely made no argument concerning either one class of shaft or another, but simply drawn your attention to a few mistakes made by your somewhat hasty correspondent, whom, I am sorry to say, could not help being personal in his remarks. Having been absent for some time travelling in Central America, I have not the necessary data to hand concerning the output of modern shafts, but I will give one example of a Continental shaft—the Zeche Prosper. In two shifts of 8 hours, one shift hauling from 2,420 feet, and one shift from 1,220 feet depth, 3,600 tons can be hoisted. This would amount in a month of 26 working days to 93,600 tons, working only 16 hours out of the 24. In the report of the Transvaal Chamber of Mines for 1910, under heading "January: Tons hoisted and taken from surface dumps," there were three mining companies out of 50 with a tonnage of over 100,000, and the highest was 183,000. I suppose these were groups of mines with various shafts working. I do not by this wish to prove that one class of shaft is better than another, but only point out that it is not so bad for Europe, which, according to M.H.C. is 50 years behind the Transvaal in shaft sinking. The speed of sinking depends always on local conditions, especially as to the quantity of water encountered.—Yours, etc.,

E. MACKAY-HERIOT, M.Inst.M.M.

19, Campden Hill Gardens,
Kensington, London,
12th April, 1912.

ANSWERS TO CORRESPONDENTS.

"Villa Bocage."—Your letter has been handed to the leading firm in the line here, who will communicate with you.

"Tin."—No information is yet available.

"Utrecht."—The reason is that De Beers are the biggest shareholders in the colliery in question.

"Anti Phthisis."—In 1902 prizes were offered by the Chamber of Mines for "the three best practical suggestions and devices for obviating, minimizing, or combating the causes leading to miners' phthisis." The advertisement offering these prizes stated that while no definite information was before the Commission, it was generally assumed that the cause of the disease lay in the inhalation by the men of fine dust produced by rock drills. Two hundred and twenty-nine competitors responded. Most of the suggestions were regarded as impracticable methods for wetting, through jets, the dust as made by the drill, and atomizers or sprinklers for laying the dust when made, received most attention, and some of the devices were regarded by the Commission as promising. This paper contemplates offering prizes for suggestions born out of our recently increased knowledge of the evil.

Ulundi G.M. Co.

The test crushing at the Ulundi mine has been of a satisfactory nature.

New Primrose.

The Directors' Report for the quarter ending March 31st, states: Some 69,200 tons were crushed at the New Primrose, the recovery being 22,403 ounces, or 6.474 dwt. per ton. Accumulated slime yielded 1,226 ounces, or 2.683 dwt. per ton treated. Revenue from current gold was £95,162, equal to 27.503s. per ton milled; working costs absorbed £49.207, or 14.221s. per ton, leaving a working profit of £45,955, or 13.282s. per ton. Accumulated slime yielded a profit of £3.768, and sundry revenue amounted to £1,322 making the total profit £51,045. Capital expenditure amounted to £129, leaving £50,916 as net profit. The results of the quarter's operations have proved very satisfactory, and there is no alteration in the amount of profit realised as compared with that for the preceding quarter. A certain amount of development work is being carried out on the Main Reef in the Primrose section, and ore of payable value is being exposed. It is satisfactory to note that the ore reserves were only depleted by 5,425 tons during the quarter.

Forbes' Coal Concession.

Mr. Richard Currie last week sold the Swaziland mineral and land concessions and rights known as Forbes' Coal Concession as follows:—(1) Land and Mineral Concession No. 19, granted on the 14th of August, 1883, for a period of eighty years, reckoned from the 3rd day of July, 1883; rental, £25 per year; area, about 98,113 morgen 63 sq. roods, subject to a deduction of 2,387 morgen 554 sq. roods to complete native area (in terms of the laws of Swaziland). (2) Portion of Concession No. 72, extending over the area of Concession No. 19, known as "Forbes' Timber Concession," for a period of fifty years, reckoned from the 18th day of May, 1889, with the right to renew same for a further period of fifty years; rental, £10 per annum. (3) All right, title, and interest of the company in and to a certain deed of agreement, dated the 3rd day of March, 1891, between George van der Hoven and others and F. S. McHattie, whereby the company is entitled to select and mark off in one block twelve thousand morgen of land (subject to a possible deduction of one-third the area thereof for natives, in terms of the laws of Swaziland), on Concessions Nos. 82 and 150. (4) Machinery and plant in the concessions. A start was made at £2,100, and the bidding reached £2,300, at which the property was sold—to whom it was not stated.

Sub Nigel.

The Directors' Report for the quarter ending March 31st, states: At the Sub-Nigel, during the March quarter, 905 feet were driven, risen, and sunk, and 12,404 tons of ore milled for a yield of 5,475 ozs., or 8.828 dwts. per ton, valued at £22,890, or 36s. 10.901d. per ton. Working costs were £21,739, or 35s. 0.622d. per ton, and working profit was £1,151, or 1s. 10.279d. per ton; sundry revenue amounted to £872, making the estimated net profit £2,023. Shaft-sinking absorbed £204: £1,337 was spent on exploratory development, and charged to working costs. At March 31, there were 200 ozs. of gold in reserve.

Sands, Limited.

It has been resolved by the Board that 8,500 shares of the nominal value of £1 each in Bonanza Sands, Limited, be distributed as a dividend in specie pro rata among the holders of Shares Nos. 1 to 500, 1,751 to 5,250, and 6,501 to 11,000, all inclusive, registered on the 15th May, 1912, the holders of the remaining 2,500 shares of the capital of the company having waived their right to any participation in this dividend.

Situations Wanted.

Advertiser seeks situation on REDUCTION WORK on small Gold Mine in outside district. Amalgamating and general mill work, cyaniding, smelting, etc. Experienced in Suction Gas Plants. Reply "REDUCTION," c/o this office.

Colliery Manager, 13 years' S.A. and 5 years' English experience, as Manager and General Manager. Fully certificated. Good Electrician. A1 testimonials and references. Is open for engagement after end June.—Apply Colley, Box 27, Indwe, Cape Province.

When communicating with advertisers kindly mention the *South African Mining Journal*.

THE APRIL OUTPUT IN DETAIL.

A Good Showing—No Reserves to Include—Average Daily Yield the Highest Recorded.

The gold output for the Transvaal for April was declared by the Chamber of Mines last week at 737,660 ozs. fine gold, of the value of £3,133,383. Compared with the total declared for March, the decrease of 93,063 ozs., value £395,305, is entirely due to the inclusion in the March declaration of gold reserves, which had been previously accumulated to the extent of £297,946, and the one working day shorter in April than in March. On the actual production obtained for both months April is not quite short of the full amount of average daily yield. The declared output for April is the actual value produced. For the Transvaal for March, after deducting the value of the reserve gold—£297,946—the actual value of the output was £3,230,742, and for April, as shown above, £3,133,383. which is £97,359 less than for the longer month. Taking the Rand figures of declared production for March, the value is given, after deducting £284,039 for reserve gold, as £3,100.361, which, compared with the actual production for April of £3,002,140, is £98,256 more than for the shorter month of April. As the average daily production for both March and April was a few pounds over a hundred thousand sterling, it is at once seen that the April returns are quite satisfactory.

The same contention applies to outside districts, when the reserve gold brought to account in March is taken into consideration. The value of the output declared by outside district mines for March totalled £144,288, which included reserve gold of the value of £13,907, the actual production therefore being of the value of £130,381. The April return of £131,243 is consequently better than for March by £862. despite the one working day short in last month. The average daily profit, which is not comparable with March because of the reserve gold which came in, works out at £29,932, which is the highest for a very long time, and appears to be the legitimate result which was to be expected from the improved labour supply. There has been a further increase in the labour complement for the month of over 3,000 boys, of whom only a third went to gold mines, but the increase which has taken place since the end of November is over 21,000 for gold mines, and no doubt some of the earlier arrivals have become proficient, and the easier labour conditions are beginning to be reflected in costs and profits. The average daily yield for the Rand is the highest yet recorded, and the daily average profit shows a substantial increase on the last fifteen months.

THE SALIENT FEATURES.

The following are the leading figures:—

Total output	737,660 ozs.
Value	£3,133,383
Decrease	93,063 ozs.
Value	£395,305
Rand output	706,763 ozs.
Value	£3,002,140
Decrease	89,992 ozs.
Value	£382,260
Outside districts	30,897 ozs.
Value	£131.243
Decrease	3.071 ozs.
Value	£13,045
Total stamps	9,991
Decrease	97
Rand	9,416
Decrease	109
Outside districts	575
Increase	12
Tube mills	264

THE STAMP POSITION.

The stamp position shows a decrease on the Rand, and an increase outside. The Rand decrease is due mainly to the reduction by Randfontein Central of 105 stamps operating. The details of changes are as follows:—Rand.—Decreases: Benoni, 10; Randfontein Central, 105; Robinson Deep, 20; miscellaneous, 10; total, 145. Increases: Aurora West, 10; Bantjes, 5; Brakpan Mines, 5; Cinderella, 5; Jupiter, 5; Simmer Deep, 5; total, 36; decrease, 109. Outside.—Increase: Miscellaneous, 17. Decrease: Sheba, 5; increase, 12; net decrease, 97.

THE FIRST DOZEN PRODUCERS.

The twelve leading companies show their proportional amount of the decrease, indeed a little more. The number of stamps operated was 190 less, due to Randfontein Central, Robinson Deep and the entry of Brakpan Mines with 115 stamps into the leading twelve, thus displacing the Village Deep for the time being. Two more tube mills were operated by these companies. The aggregate tonnage milled was 72,681 tons short of the March total, and value produced £67,364 less. There are several changes in the order of highest production. Crown Mines takes second place in lieu of Randfontein Central. New Modderfontein goes up from eighth to sixth, Geldenhuis Deep from ninth to seventh, and Nourse Mines from tenth to eighth. Simmer and Jack and Robinson Deep drop from sixth to seventh to ninth and tenth respectively. Village Deep drops out and Ferreira Deep steps up from eleventh to tenth, while Brakpan Mines enters the list of the leading dozen as twelfth. The details of operations are as follows:—

	Stamps.	Tubes.	Tons.	£
East Rand Proprietary	820	25	157,500	267,743
Crown Mines	660	22	149,500	247,405
Randfontein Central	700	29	199,518	241,509
Robinson	250	6	44,600	97,864
Rose Deep	300	7	62,500	90,893
New Modderfontein	180	7	43,620	87,465
Geldenhuis Deep	300	7	55,400	86,144
Nourse Mines	260	7	51,400	83,850
Simmer and Jack	320	7	74,100	81,161
Robinson Deep	210	5	49,900	80,660
Ferreira Deep	160	4	32,310	78,451
Brakpan Mines	115	6	48,173	74,098
	4,275	132	968.521	£1,517,253

GROUP PROFITS.

The following are the profits returned for February, March and April by the mines controlled by the different groups:—

	February.	March.	April.
Rand Mines	£209,989	£267,989	£224,289
Rand Mines Eckstein group	213,242	373,426	225,284
Gold Fields group	111,697	120,190	113,026
Farrar—Anglo-French group	89,808	115,473	114,608
General Mining group	48,400	61,777	60,494
Barnato group	58,273	61,223	63,336
Neumann group	46,072	52,686	55,333
Consolidated Mines Selection group	23,231	26,119	30,949
Goerz group	12,242	11,231	10,649
Totals	£812,954	£1,090,114	£897,968

INCREASES AND DECREASES.

Increases and decreases compared with March are as follows:—

The Witwatersrand.

	March.	April.	Inc.	Dec.
Aurora West	14,425	14,761	336	—
Bantjes Consolidated	34,772	34,445	—	327
Benoni Consolidated	18,486	18,571	85	—
Brakpan Mines	71,918	74,098	2,180	—
City and Suburban	49,911	50,497	586	—
Consolidated Langlaagte	29,763	29,071	—	697
City Deep	68,163	69,200	1,037	—
Cinderella Consolidated	27,360	27,525	165	—
Crown Mines	257,884	247,405	—	10,479
Consolidated Main Reef	30,877	30,040	—	837
Durban Roodepoort Deep	36,029	37,673	1,644	—
Durban Roodepoort	15,343	14,572	—	591
East Rand Proprietary	280,975	267,743	—	13,232
Ferreira Deep	77,258	78,451	1,193	—
Ferreira	31,331	27,113	—	4,218
Geldenhuis Deep	82,703	86,144	3,441	—
Ginsberg	20,963	20,559	—	404
Glencairn	15.891	15,644	—	247
Geduld	19,289	18,486	—	803
Jumpers cum-Treasury	17,823	16,999	—	824
Jupiter	43,934	40,103	—	3,831
Knight Central	26,191	29,904	3,713	—
Knights Deep	51,330	52.336	1.006	—
Lancaster West	24,034	20,266	—	3,768
Langlaagte Estate	59,901	60,131	230	—
Luipaardsvlei Estate	16,005	15,865	—	140
May Consolidated	16.082	16,320	238	—
Meyer and Charlton	34,059	33,859	—	191
Main Reef West	26.543	26,506	—	42
Midas Deep	833	616	—	217
Modder B.	61,477	60,734	—	743
New Rietfontein Estate	21,315	20,155	—	1,160
New Goch	27.725	25,847	—	1,878
New Heriot	21,697	27,109	412	—
New Kleinfontein	55.582	54,745	—	837
New Modderfontein	86,531	87,465	934	—
New Unified	16,889	16,625	—	264
Nourse Mines	80,982	83,850	2,922	—
New Primrose	34.266	33,655	—	611
Princess Estate	22.662	21,799	—	863
Randfontein Central	260,615	241.509	—	19,106
Rose Deep	95,098	90,893	—	4,205
Robinson	106,117	97.864	—	8,253
Roodepoort United	31.888	29,216	—	2,672
Robinson Deep	87,345	80.660	—	6,686
Simmer and Jack	91.101	81,161	—	9,940
Simmer Deep	43,552	39,155	—	4,397
Simmer East	29.352	29,394	42	—
Spes Bona	5.875	5,692	—	183
Village Deep	78.061	70,886	—	7,175
Vogelstruis Estate	12.607	12,382	—	225
Village Main Reef	67,874	70.321	2,447	—
Van Ryn	60.726	50,200	—	10,526

	March.	April.	Inc.	Dec.
West Rand Central	4,163	3,874	—	289
Witwatersrand	46,980	45,332	—	1,648
West Rand Consolidated	34,870	36,305	1,435	—
Witwatersrand Deep	55,526	53,007	—	2,519
Wolhuter	41,309	40,167	—	1,142
Miscellaneous producers	18,152	22,055	3,903	—

Outside Districts.

	March.	April.	Inc.	Dec.
Barrett	807	820	13	—
Nigel	20,521	19,977	—	544
Sub Nigel	8,156	9,345	1,189	—
Sheba	12,369	12,624	255	—
Transvaal G.M. Estates	39,402	41,369	1,967	—
Worcester Exploration	5,407	5,773	366	—
Sheba (Rosetta)	1,640	1,712	72	—
Glynn's Lydenburg	7,969	7,247	—	722
Miscellaneous producers	34,110	32.376	—	1,734

THE LABOUR POSITION.

The following labour figures for April are compiled and furnished by the Chamber of Mines:—Number of natives employed last month by members of the Witwatersrand Native Labour Association and contractors:

On gold mines	197,937
On coal mines	8,364
On diamond mines	13,785
Total	220,086

OUR MONTHLY TABLE.

The following is our usual monthly table:—

The Witwatersrand.

	Tons.	Stamps.	Tubes.	Ozs.	Value
Aurora West	12,726	71	—	3,475	14,761
Bantjes Consolidated	22.660	70	3	8,109	34,415
Benoni Consolidated	17,900	45	3	4,372	18,571
Brakpan Mines	48,173	115	6	17,444	*74,098
City Deep	39,000	110	9	16,291	69,200
City and Suburban	25,539	140	2	11,881	50,497
Cinderella Consolidated	18,010	80	3	6,480	27,525
Consolidated Langlaagte	20,050	140	—	6,844	29,071
Consolidated Main Reef... ...	21,967	100	3	7,072	*1,015
Crown Mines	149,500	660	22	58.244	247,405
Durban Roodepoort	13,473	90	—	3,473	14,752
Durban Roodepoort Deep ...	24,300	100	3	8,869	37,673
East Rand Proprietary	157.500	820	25	63,032	267,743
Ferreira	18,200	80	3	6,883	27,113
Ferreira Deep	32,310	160	4	18,469	78.451
Geldenhuis Deep	55,400	300	7	20,280	86,144
Ginsberg	13.537	80	1	4,840	20,559
Glencairn Main Reef	18,588	160	—	3,683	15,614
Geduld Proprietary	14,050	50	2	4,352	18,486
Jupiter	39.450	110	6	9,441	*40,103
Jumpers-cum-Treasury	7.910	80	—	4,002	*16,999
Knights Deep	59.720	270	6	12,321	52,336
Knight Central	23,900	110	3	7.040	29,904
Lancaster West	17,350	100	3	4,771	20,266
Langlaagte Estate	51,619	200	5	14,156	60,131
Luipaardsvlei Estate	16,400	60	3	3.735	15,865
Main Reef West	15,498	80	2	6.240	26,506
May Consolidated	12.000	100	—	3.842	16,320
Meyer and Charlton	13.800	75	2	7,971	*4,248
Midas Deep	1.350	15	—	145	615
Modderfontein B	30,900	80	5	14,298	60.734
New Goch	24.792	120	4	6.085	25,847
New Heriot	11,600	70	2	5.205	22.109
New Kleinfontein	38.900	220	—	12,888	54,745
New Modderfontein	43.620	180	7	20,591	87,465
New Primrose	—	160	—	7,923	33,655
New Rietfontein Estate	15.275	120	—	4.745	20,155
New Unified	10,300	60	1	3,914	16,625
Nourse Mines	51.400	260	7	19,740	83.850
Princess Estate	17,800	50	5	5.132	21.799
Robinson	44.600	250	6	23,039	97,864
Robinson Deep	49,900	210	5	18,989	*80,660
Randfontein Central	199,518	700	29	56,856	241,509
Roodepoort United	26,875	50	3	6,878	*29,216
Rose Deep	62,500	300	7	21,398	90,893
Simmer Deep	44,100	120	9	9,218	39,455
Simmer and Jack	74.100	320	7	19,107	81,161
Simmer East	31,700	130	3	6,920	29,394
Spes Bona Tribute	5.666	40	—	1,340	5,692
Van Ryn	38,650	125	6	11.818	*50,200
Village Deep	49.200	180	6	16,688	70,886
Village Main Reef	37,950	220	5	16,555	70,321
Vogelstruis Estate	10.346	70	—	2.915	12,382
West Rand Central...	2.750	20	1	912	3,874
West Rand Consolidated	27,500	100	4	8.547	36,305
Witwatersrand	38.520	220	—	10,672	45,332
Witwatersrand Deep	36.630	245	4	12,479	53,007
Wolhuter	29,000	120	4	9,456	*40,167
Miscellaneous producers	—	—	—	5,192	3,874

Outside Districts.

	Tons.	Stamps.	Tubes.	Ozs.	Value
HEIDELBERG—					
Nigel	12,750	75	1	4,703	19,977
Sub Nigel	4,224	30	1	2,200	*9,345
BARBERTON—					
Barrett	—	—	—	193	820
Sheba (Rosetta)	1,017	20	—	403	1,712
Sheba	5,350	65	—	2,972	12,624
Worcester Exploration	5,250	40	—	1,359	5,773
LYDENBURG—					
Glynn's Lydenburg	3,005	20	1	1,706	7,247
Transvaal G.M. Estates	12,156	75	2	9,739	41,369
KLERKSDORP—					
Miscellaneous producers	—	—	—	7,621	32,376

*Brakpan Mines includes 3,800 ozs, value £16,141, taken from reserve and now declared, 2,800 ozs. of which come into the general total included in the March output, but not declared by the company. *Jumpers-cum-Treasury includes 357 ozs. taken out of month's production and added to reserve. *Consolidated Main Reef, includes 239 ozs., value £1,015, taken from actual output and added to reserve. *Meyer and Charlton, includes 1,000 ozs., value £4,248, taken from actual output and added to reserve. *Roodepoort United, includes 235 ozs., value £998, taken from actual output and added to reserve. *Van Ryn, includes 268 ozs., value £1,138, taken from reserve and added to declared output. *Jupiter, does not include 125 ozs., value £531, taken from reserve. *Robinson Deep, does not include 190 ozs., value £807, taken from reserve. *Simmer and Jack, does not include 400 ozs., value £1,699, taken from reserve. *Simmer Deep, does not include 334 ozs., value £1.419, taken from reserve. *Wolhuter, does not include 235 ozs., value £998, taken from reserve. *Sub Nigel, does not include 200 ozs., value £850, added to reserve. *Sheba, does not include 1 oz., value £4, added to reserve.

Mooifontein Diggings.

Mooifontein No. 4 was proclaimed on Wednesday last.

Messina Development.

The National Bank of South Africa and Chaplin Milne Grenfell and Co., as agents for the purchasers, have closed the list of applications at 95 per cent. for £183,000 six per cent. debenture stock in the Messina (Transvaal) Development Co., Limited. Subscribers who receive allotment will be entitled to subscribe before March 1, 1915, for one share of 5s. in the capital of the company at 22s. 6d. per share in respect of each £2 of debenture stock. The stock will be constituted and secured by a trust deed whereby the company will charge by way of floating charge with the payment of the stock and the interest thereon its undertaking and all its property, present and future, including its uncalled capital. The company will covenant with the trustees that, subject to the payment of the interest on the stock, it will in each financial year, commencing from July 1, 1916, pay to the trustees as a sinking fund for the redemption of the stock the whole of the net profits of the company up to £35,000 in each financial year. The sinking fund so formed will be applied by the trustees in the redemption of stock, by purchase in the open market at or below 105 per cent., exclusive of accrued interest, or by redemption by drawings at the same rate. The proceeds of the debenture stock will be applied in furnishing the company with additional working capital to further develop and equip the mine and enlarge the present mill's capacity to 120,000 tons per annum, and establish smelting works, hitherto postponed owing to the lack of adequate transport facilities.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings, Box 2061, Johannesburg.

Electrical Notes.

ELECTRICAL ACCIDENTS IN MINES.

Their Causes and Prevention and Directions for Treatment.

[By H. H. CLARK, U.S.A. Bureau of Mines.]

ONE of the purposes of the work carried on by the U.S.A. Bureau of Mines is to make mining safer. For this reason the Bureau is investigating the causes of mine accidents, the methods by which such accidents may be prevented, and the best ways of rendering aid to those who are injured or put in danger by accidents. This circular tells what are the chief causes of electrical accidents in mines, briefly points out the precautions that should be taken to avoid or prevent these accidents, and gives directions for treating persons suffering from electric shock or burns.

Definitions.—To make this circular clear to persons not familiar with electrical matters, the following terms are defined:—*Electric conductor.*—An electric conductor is something through which electric current may flow, just as a pipe is something through which water may flow. *Electric circuit.*—An electric circuit is a system of electric conductors joined together so that electric current may flow through them, as water flows through a system of pipes. *Complete circuit.*—A complete circuit is one in which the current may flow freely, with nothing to stop it. *Current strength.*—The strength of a current is its amount. A large current may be considered as stronger than a smaller one, because it has more effect upon a man's body. *Alive and live.*—Alive and live are terms that mean "charged with electricity," and are used in speaking of conductors, circuits and machines that are in a condition to give an electric shock. *Insulator.*—An insulator is something that stops the flow of electric current, just as a dam stops the flow of water. *Voltage.*—Voltage means electric pressure. Voltage causes electric current to flow, just as water pressure causes a current of water to flow.

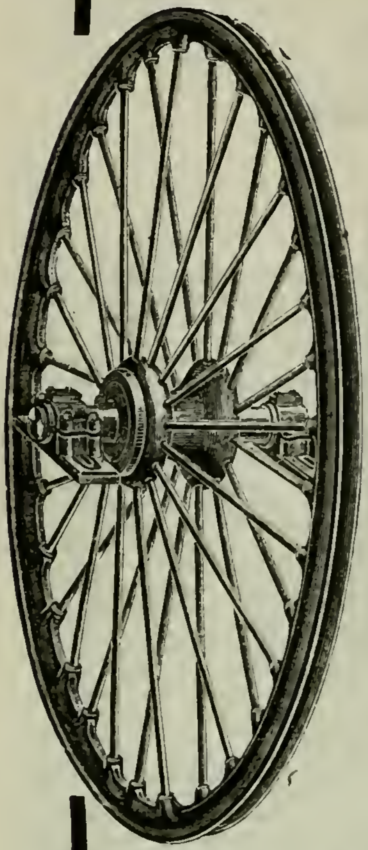
Chances for Shock in Mines.—In handling live electrical machines or wires, or in working near them, care must be used to avoid getting a shock. This is especially true when the wires or machines are underground, because, as a general thing, there is little space, little light and much dampness in a mine, and these are conditions which help to make electrical accidents possible. The fact that the earth is used as a return circuit for the electric current places the miner in the position of standing upon one terminal of an electric generator; therefore, if he touches only a single point connected to the other terminal of the generator (such as the trolley wire, a metal part of a switch, a bare place on a mining-machine wire, or a live part of a motor) he is likely to receive a shock, the effect of which will vary with conditions from a severe jolt to a bad burn or even death.

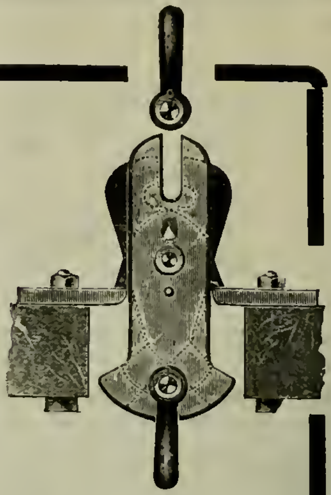
General Causes of Shock.—A man's body is an electric conductor, although it is not as good a conductor as a trolley wire or a track rail, and current will flow through the body if it is made part of an electric circuit. The effect that such a current will produce depends upon its strength. The current may be so small that it cannot be felt; it may be only strong enough to give a slight shock; it may be so strong that it will burn the body; or it may be strong enough to produce insensibility and death. The amount of current which will flow through a man's body when it is made part of an electric circuit depends upon two things: (1) The voltage or pressure of the circuit; (2) the completeness of the contact between the man's body and the circuit. Under the same conditions more current will flow from a large voltage than from a smaller one. A single-cell battery giving one to two volts can cause a current to flow through the body, but the current is too small to be felt. Much more current will flow through the body from contact with a 110-volt circuit. Such a current will give a slight shock. Contact with circuits of higher voltage allows even stronger currents to flow and these give more severe shocks. If a perfect insulator could be found, a man might stand upon it and place his hand upon a 500-volt trolley wire without receiving a shock, because the circuit through his body would not be complete and no current could flow. If a man should stand upon damp earth and handle a live trolley wire with gloves that were moist with sweat he would probably receive a severe shock, because a circuit would be completed through his body. If he wore no gloves the shock would be heavy enough to knock him down and might even kill him, because the circuit through his body would be still more complete. There are some men, but not many, to whom this last statement does not seem to apply. It is most important to realise the extreme difficulty of so insulating the body that a circuit cannot be completed through it. There is no such thing as a perfect insulator, although for practical purposes a number of things may be so considered. The most that can be done is to so insulate the body that the current which passes through it will be so small that no shock will be felt. The difficulty of doing this becomes greater as the voltage that is handled increases. The most common voltages used underground are 110, 250, and 500 to 600 volts. The first voltage, which is used very rarely, is not hard to guard against, and the conditions under which it will give a severe shock are seldom, if ever, met. It is much more difficult to protect the body from 250 volts, and in working about circuits of 500 to 600 volts great care must be used in order to escape shock, especially when the earth is used as one side of the circuit, as it very often is in mine work.

Some Direct Causes of Shock.—Trolley Wires.—The reports of the mine inspectors of several States indicate that most of the shocks received in mines result from contact with trolley wires. These wires have to be bare of insulation, and they cannot easily be shielded from passers-by throughout their entire length. A trolley wire must often be strung less than a man's height from the floor, with a track rail almost directly underneath it. Everything combines to make it dangerous to travel in the same entry with a trolley wire, especially if tools are being carried or things are happening that distract the attention. Great care is necessary to avoid shocks in crossing over trips of cars or entering or leaving them from the trolley-wire side. In such cases a man's head must pass close beside the wire at the time that his attention is given to watching his footing. *Accidentally Charged Equipment.*—Next to contact with trolley wires, the most likely cause of shock is contact with parts of machines or equipment that are not supposed nor intended to carry current, but are accidentally charged with electricity. This charging is caused by the failure of insulation or by a live wire coming in contact with equipment. The frame of a motor or cutting machine or the iron casing of an inclosed switch may become alive and may then give as bad a shock as a trolley wire. Such a condition is especially dangerous because it is unexpected. The frame of a locomotive is usually so completely in contact with the track rail that a man cannot get a shock by standing on the rail and touching the locomotive, but this may not always be the case. If for any reason there is a great deal of sand on the rails the locomotive frame may be almost completely insulated from them. In that case a shock may be received from the locomotive frame or the draw-bars of cars coupled to the locomotive. Other shocks are caused by contact with those parts of equipment that are known to be alive but are touched by accident while handling apparatus or repairing it. This applies to connections made to the trolley wire while it is carrying current, to the adjustment of motor brushes, and to all repairs made to apparatus that is alive.

Precautions.—The best way to avoid electric shock is to show due respect for the electric current. Indifference to the dangers of electricity does not indicate courage or wisdom, but poor judgment and ignorance. The fact that a man does not get hurt when he is careless in handling electric wires does not prove that he is cleverer than other men, but rather that he is more fortunate. The worst feature of such acts is the bad effect that they have on those who see them or are told about them. Those who know about electrical apparatus and are employed to handle and repair it should try to teach others to be careful instead of encouraging them to be careless. The only sure ways to escape shock are to keep away from the trolley wire, especially when carrying tools; to avoid touching electrical machines unnecessarily; and to provide and use some means of insulating the body when making repairs on electrical apparatus. If there is a way to cut off the current from apparatus the current should be cut off before the apparatus is handled. If it is necessary to work on apparatus that is carrying current, every precaution should be taken to insulate the body from the ground. It is impossible to tell whether conditions are safe unless the workman has made them so himself. No one can tell by merely looking at a motor whether or not the parts that carry current have come in contact with the frame of the machine. A workman cannot be certain whether the place where he must stand to repair live apparatus will sufficiently insulate his body from shock. The only way for him to be safe is to provide something suitable to stand on while making repairs. In doing this he should remember that *dryness* is the most desirable quality. Dry boards, free from nails, are good for the purpose. Rubber gloves or leather gloves in good condition and without metallic fastenings will protect the body from shock. If the rubber covering of gloves is worn thin, the gloves give almost no protection. The same is true of leather gloves that are damp with water or sweat. Rubber boots without nails in the soles or heels are good protection when new, but if the soles are worn or cracked, their insulating value is doubtful. The position of the body is an important matter in handling apparatus that is carrying current. If a man has merely to make some adjustment he should use but one hand, if possible. He should also try to place his body so that the involuntary recoil from a possible shock will remove his hands from the apparatus instead of causing them to grasp it. The use of rubber tape on the handles of pliers, screw-drivers and wrenches cannot be depended on unless the tape has been freshly and carefully applied. Rubber coverings for the handles of such tools are a protection if the coverings are new and in good condition, but even then the chances are great of touching the hand or the fingers to an uncovered part. Insulated tools should not be trusted to give entire protection. There is one practice that cannot be condemned too severely, and that is the wilful giving of electrical shocks to others. This may be done impulsively or may be deliberately planned, but it is always dangerous. The effect of such a trick cannot be foreseen because there are so many things to consider. The person who is given the shock may be so placed and so constituted that serious and even fatal results will follow.

(To be continued.)





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Engineering Notes and News.

Power Consumption of Fans.

M. A. Lapouche discusses this subject in a paper read before the Société de l'Industrie Minérale (Vol. 14, No. 5, p. 401), with special reference to the use of electricity as a motive power. The author remarks that in choosing a fan a difficulty often arises from the fact that the "equivalent orifice" of the mine cannot be definitely ascertained owing to the mine being still undeveloped. This may result not only in waste of energy but also in an increase in the power consumption, that is to say, an overload on the motor. Until in 1900 electricity began to supersede steam in the driving of fans, this latter consideration was of less weight, owing to the engine being able to accommodate itself to such overloads; with electricity these variations in load become a more costly matter, especially where alternating current is employed. As a consequence, motors have frequently been selected well above the normal capacity of the fan, with a consequent loss in efficiency. A second solution lies in the employment of motors of special construction. A third combination, however, has found favour, this being the use of motors of practically a fixed speed, but coupled to the fans in such a manner that the power consumption varies but little. M. Lapouche refers to the Rateau and Monnet and Moyne fans installed at Lens, in which the vanes are so constructed as to give a large section of passage. Nevertheless, these fans have given somewhat divergent results. Whilst the Rateau fan shows a relatively low rise in power consumption when the equivalent orifice passes from 1·75 to 3·50, the Monnet and Moyne fan, on the contrary, has a variation of close upon 100 per cent. This fan, however, has such a manometric co-efficient that the depression obtained is 149 mm. of water on an orifice of 2·50, with a peripheral speed of 30 m., whilst the Rateau fan exacts a peripheral speed of nearly 51 m. under the same conditions. The author comes to the conclusion, after citing various practical tests, that in modifying the design of the vanes and, as a consequence, the manometric co-efficient as well as the sections of passage, it is possible to arrive at the construction of fans in which the variations in power are very small in relation to the variation of the equivalent orifice, and at the same time are well suited to be driven by electricity. He points out, moreover, that in the helicoidal fan the power consumed does not vary or even diminish when the equivalent orifice is increased. These fans, a number of which have been installed in the iron ore mines in the west of France, are less costly than centrifugal fans, and their installation is simple. They are particularly suitable for use below ground, and on account of their relatively high speed they lend themselves to direct coupling with electric motors.

New Patents.

177. William Alderson.—Improved method for burning and consuming and incinerating dynamite, powder and other fumes and dust, and other particles and the like in the atmosphere caused by blasting.
178. Donald Barns Morison.—Improvements in water jet ejectors.
179. Noak Victor Hybinette.—Improvements in a process of extracting copper from a sulphate solution.
180. John George Robinson.—Improvements in and relating to steam superheaters for locomotives and other boilers (transverse compartment header).
181. John George Robinson.—Improvements in and relating to steam superheaters for locomotive and like tubular boilers (two compartment header).
182. Harry Templeton Villiers.—Improvements in distempers and the like.
183. Edgar Percy Hedley.—Improvements in torches suitable for fuse lighting.
184. Edgar Percy Hedley.—Improvements relating to torches suitable for fuse lighting.
185. Archibald Thorburn.—A mechanical washer for a complete washing off of sulphur and refractory elements from pyritic ores.
186. Botho Schwerin.—Improved process for treating finely subdivided substances by electric osmose.
187. Henry Squarebridge Mackay.—Process of extracting metals from ores.
188. Richard John Fry.—Improvements in machines for shaping prepared blanks in the manufacture of horse shoes.
189. W. M. Still and Sons, Ltd., Andrew George Adamson, and Arthur James Douglas Kitson.—Improvements in vapour burning lamps.
190. Joseph McHenry.—An improved machine for winding or rolling felt, linoleum, paper, cloth and other materials.
191. George Johnston.—Improvements in central buffers and couplings for railway and like rolling stock.
192. Charles Harold Taylor and Maurice Edward Marsden.—Improved drill bar and bracket.
193. John Henry Messenger.—Improvements in tyres.
194. G. H. Rotherham.—Improvements in tube mill linings.
195. Ernest Holroyd Martin.—Improvements in pebble feeders for tube mills.
196. Oswald Victor Whittle, and James Houston.—Improvements in electrical signalling systems.
197. Andrew Harvey.—Improvements in tube mill linings.
198. Benjamin Raffael and James Kerr Fulton.—A new or improved composition or preparation for lubricating gear wheels and the like.
199. Rollo Bowman Ballantine.—Cleaning or sooting device applicable to tubular boilers and the like.
200. Albert Holdsworth.—A new or improved turbine driven tube cleaner.
201. John Galileo Barclay, and Archibald Newton Barclay.—Improvements in connection with the raising and lowering of pit cages.
202. John Lang. and John Johnston.—Improved roller supports.
203. Daniel Henry Essler.—Wet process for the separation and extraction of the gold contained in antimony ores.
204. Cecil Watson.—Improvements in centralising gear for railway buffer and like couplings.
205. Michael Setter, Alexander Elsworth Keith, Edward Arthur Mellinger, and Talbot Grant Martin.—Improvements in or relating to telephone systems.
206. James Dunlop Wilson.—Improvements in fuse lighters.
207. John Foye, and Henry Egbert Moore, and Robert Boyle.—Improvements in the treatment of refractory ores.
208. John George Robinson.—Improved pressure release valve for use in connection with locomotive and other steam engines.
209. James Edward East.—Improvements in deep furrow cultivators and the like.
210. Charles Craig and Henry Gilbert Hubbart.—Improvements in cooking stoves, heating stoves and the like.
211. James Conning.—Improvements in respirators.
212. Guiseppe Antonio Pietro Provay.—Improvements in truck tipplers or means for discharging the contents of trucks and like vehicles.
213. Gogu Constantinescu.—Improvements in carburettors for internal combustion engines.
214. Wharton Byrd McLaughlin.—Improvements in and relating to a method of and apparatus for desiccating fluid substances.
215. Alexander Elsworth Keith.—Improvements in or relating to telephone systems.
216. Herman Horwitz.—Apparatus for measuring and distributing liquid soap and other liquids.
217. Frank Edward Oakes.—An improved torch for lighting fuses for blasting and the like.
218. Adam Richard Stacpoole.—Improvements in the linings of tube mills, amalgam barrels, and the like.
219. Henry Charles Herbert Braun.—Improvements in means for stoppering bottles.
220. Antai Fodor.—Apparatus for connecting, conducting wires, cables and the like.
221. Alfred Pickthall and Daniel Roberts.—The Pickthall Patent dust arrestor.
222. Lewis Horwick.—Improvements applicable to kettles, pans, urns, and other utensils for the heating of liquids.
223. William King Riley.—Improvements in processes and products of forming drill steel.
224. William King Riley.—Improvements in drill mechanism.
225. Whitman Symmes and Walter Edwin Trent.—Method and apparatus for precipitating cyanide solutions.
226. James Henry Reid and George Goodwin.—Improvements in electric arc furnaces.
227. The Northern Lime Co., Ltd.. and Bernard Macdonald.—Improvements in apparatus for treating ore pulp slimes and the like.
228. Wilhelm Mauss.—Thermodynamic process and apparatus.
229. Arthur Leon Felix Guillame de Groof.—An improved agricultural implement for harrowing, weeding and levelling land.
230. Hans von Kramer.—Improved means for the regulating and control of railway and like traffic.
231. George Babe Jackson.—Improvements in or relating to detonating signals for railways.

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Royal Colonial Institute and Empire Trade.

The Royal Colonial Institute reports, *inter alia*, on the work of its Trade and Industry Committee during the past year:—It is not a year since the Royal Colonial Institute, which during its four decades of life has done so much to interest home-staying Britons in their magnificent heritage beyond the seas, undertook a new and promising mission by founding its Empire Trade and Industry Committee. Till then the Institute, though the principal rallying point for Imperialists and a focus of all kinds of intelligence concerning what has been so aptly termed Greater Britain, had devoted but little attention to the economic aspect of the British Empire. It is true that its well-furnished library contained many volumes of the greatest value to the British man of business who wished to open up relations with the Dominions beyond the seas, with India, or with any of our numerous Crown Colonies. In the newspaper room were hundreds of papers from every part of the Empire, carefully filed and preserved for future reference in the British Museum Reading Room. But men of business have little time for research work of any kind. It was felt that something more was needed if the Institute was to maintain its place as the headquarters of all the vast interests connected with the world-wide British Empire. It was these considerations which brought into existence the Institute's Empire Trade and Industry Committee, of which it was, and is, the purpose to place at the command of British captains of industry and of British merchants, the most up-to-date information regarding the economic progress of the overseas Dominions, of the Empire's important Eastern Dependencies, and of those of the Crown Colonies. Another part of the Committee's work is to do the same good service for Greater Britain, and to find, as far as possible, suitable avenues for British products in this country. As the Imperial Parliament is the supreme guardian of British interests throughout the world, it seemed advisable that the Committee should pass such resolutions as might appear calculated to further urgent reforms in our commercial system and in official relations with the conomic developments of the British Empire. These are all practical and practicable ideals, and it only remains to consider briefly how far the Committee has been able to live up to its aspirations. The Committee commenced its operations by communicating with all the overseas Dominions' trade departments, and by inviting them to forward to the Institute all literatnre and any kind of statistics issued by them. The response to the invitation has been most gratifying. The literature so collected is being carefully filed by the Institute, and placed in the most accessible form for the instruction of all who are interested in the economic and financial development of our Dominions and Colonies.

* * * *

The Rich South-West.

" The country within a 100-mile radius of Cape Town could produce foodstuffs enough to feed the whole white population of South Africa." That remark by the Rt. Hon. J. X. Merriman crystallises the message contained in a " boosting " booklet issued by the energetic Cape Publicity Society. The sub committee of that Society (Messrs. J. W. Jagger, M.L.A., and R. R. Brydone) sent out Mr. Ernest Glanville last year to explore the rich south-west in search of particular instances of " banner " development which would stand as an example of the work necessary to verify Mr. Merriman's bold declaration of the faith that was in him. In the south-west the conditions of supply as affected by (1) transport, (2) markets, (3) soil and climate, are, he holds, on the side of production, and production is increasing. There are remarkable examples of closer settlement over the area, which sweeps round from Caledon via Worcester and Ceres to Saldanha Bay. Forty white families supported by 800 acres down to lucerne at a yield of £21 10s. per acre; eleven cottages with their families on a 10 acre grape, fruit and grafting farm which yields about £30 per acre; several cottagers and their families (with employment for 200 temporary hands in the drying season) on a farm of 200 acres down to vines and fruit returning £2,000 nett per annum; sixteen cottagers, some of them white, on a 900-acre dairy farm which owns some cows which yield 10,000 lbs. of milk in the year; several white families of labourers on a mixed farm of 1,500 acres whose net return must be close on £2,500. These are instances picked from the Breede River, from Piquetberg, from Moorreesburg, Ceres, Hopefield, Malmesbury, Stellenbosch and Constantia, and that wide area shows more land under the plough than probably any other strip of equal size in South Africa. Mr. Glanville's book will create wide interest, and should have a most useful effect.

* * * *

South African Railways.

The following statement shows for the month of April, 1912, the approximate tonnage and percentage of commercial seaborne traffic from the different ports to stations within the competitive zone, i.e., Vereeniging—Pretoria, Springs—Klerksdorp inclusive, and including the South Rand and Vereeniging—Canada Junction lines.

Traffic.	Tonnage.			Percentege.		
	Cape Ports.	Port Natal.	Lourenco Marques.	Cape Ports.	Port Natal.	Lourenco Marques
GROUP I.						
Rate 1 ... ... Rate 2 ... ... Rate 3	4,450	10,884	13,300	15·54	38·01	46·45
GROUP II.						
Rate 4 ... ... Rate 5 ... ... Rate 6 ... ... Rate 7 ... ... Rates 8 and 13 ...	1,092	1,880	9,722	8·60	14·81	76·59
Total	5,542	12,764	23,022	13·41	30·88	55·71

* * * *

Rhodesian Finance.

In the Rhodesian Legislative Council, this week, the Treasurer, in making a financial statement in connection with the Estimates, referred to the excessive cost of living, and deprecated any changes in the Customs tariff pending the revision of the Union tariff. The revenue for 1911-12 with the preceding year's surplus totalled £864,723, and the expenditure was £838,051. The estimated revenue with the surplus for 1912-13 was £853,972, and the expenditure £894,714. Including £510,000 to be spent on roads, it was estimated that the deficit would be £4,074. The Treasurer added that the British South Africa Company were prepared, as heretofore, to assist by the use of capital provided by the shareholders, and had sanctioned an expenditure considerably in excess of revenue. The estimated expenditure, although not strictly necessary, would be highly beneficial.

* * * *

Union Census Returns.

The Union census returns were issued this week. They show a total population of 5,973,394, comprising 3,069,392 males and 2,904,002 females, of which 1,276,242 are Europeans or whites and 4,697,152 other than Europeans or whites. The figures for 1904 were 5,175,824, of which 1,116,806 were Europeans or whites, and 4,059,018 other than Europeans or whites. The following are the figures for the various Provinces (total population Europeans or whites, and other than Europeans or whites, respectively):—Cape: 2,564 965; 583,377; 1,982,588. Natal: 1,194,043; 98 114; 1,095,929. Transvaal: 1,686,212; 420,562; 1,265,650. Free State: 528,184; 175,189; 352,985.

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→ 3 ←

FACTS REGARDING THE
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WORTH REMEMBERING.

1. The **TRANSVAAL** is producing over one-third of the World's Gold Output.
2. **TRANSVAAL** Mines have spent 24 millions sterling on machinery and plant
3. The **"South African Mining Journal"** is the **Official Organ** of the **Mine Managers' Association.**

The South African

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Is the Authority on all Metallurgical Subjects, and is at once a - - - -

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ADVERTISEMENT RATES ON APPLICATION

Automobile Notes.

The Motor Traders' Cup.

The Transvaal Automobile Club held the annual competition for the Motor Traders' Cup, open to amateur drivers, and for the Club Cup, open to trade members, on the 16th instant, under the rules and conditions referred to last week; the venue selected being a course previously described, of approximately 80 miles. Only eight entries were received for each event, at the time of writing, out of a Club membership of several hundred, which, one must remark, reflects a decided apathy among members in connection with the sport, difficult, however, to explain. At all events, those who advocate the "too much sport" theory, in South Africa, must hold distinctly separate views in regard to T.A.C. motorists, and while making no pretence to solve the indifference exhibited, one's sympathy is extended to the organisers of these competitions, who certainly spare no pains in the endeavour to make the various contests attractive to all, and whose efforts, it is to be regretted, lack the appreciation they deserve. The working out of the awards or formula, by the Club officials, necessitates considerable delay, but results, when available, will be published in the usual way.

A Promising Enterprise.

A new company, it is understood, of a private nature, is being formed, which purposes the purchase of several excellently equipped char-a-bancs for public use in Johannesburg and districts. Some little time ago the possibility of the motor bus was discussed in these columns, when it was pointed out that success in that direction would be largely determined by the routes selected for the operations of a motor 'bus scheme. In districts, for example, already catered for by an excellent tramway system, the promotors of a service of another nature, run in opposition, could scarcely expect to realise working costs, much less a dividend, whereas, on the other hand, districts and suburbs not served by trams might offer inducement worthy of consideration. The new service, however, is intended to be run in the interests of pic-nic parties and others, to some of the popular week-end resorts, such as Henley, Pretoria, Potchefstroom, etc., while providing at other times supplementary services to the various district racecourses and other places, and by this means ensure for the scheme a measure of patronage. The promoters meantime predict for the venture a successful issue.

The Tyre Bill.

The tyre bill being easily the biggest item in the upkeep of a car, ways and means to reduce its proportions are constantly uppermost in the minds of economically inclined motorists. Owner drivers, however, are not sufferers in this direction to the extent of those who entrust their cars to others, at least, this belief is borne out on analysis. It follows as a natural consequence that the man who has to foot the bill for expenses—that is the owner—will use his tyres in a careful manner, and keenly considers, for example, the damaging effect of sudden clutch engagement when his engine is running fast, and is also cognisant, in his own interests, of the great strain consequent to an indiscriminate application of brakes, and so forth, avoiding whenever possible, these sources of injury, which so often result from the careless and incompetent handling of cars by drivers, who are responsible for infinite harm to the mechanism of the car, in addition to the havoc wrought on tyres, with which this article deals. The capable and careful driver will use his brakes and clutch judiciously, and by so doing conserve his tyres to an appreciable extent, and until owners recognise this fact, so long will fat tyre bills provide cause for complaint.

Motor Traffic.

The notice boards erected some time ago in the vicinity of Twist Street, prohibiting traffic during certain prescribed hours, have become quite familiar to the motorists, especially those of the northern suburbs, and in serving the excellent purpose for which they are intended in regard to the school children, are respected without demur. The suggestion of a correspondent in a contemporary, evidently influenced by the foregoing ruling of the authorities to exclude motor traffic from certain busy street intersections in similar manner, and direct it into other channels, is rather far-fetched, and must be discouraged, as, unless some specific danger is entailed, such as possible injury to children, the motorists, liberties should in no way be curtailed. It may be of interest to the inspired writer holding such views, to learn that in parts of New York and other American cities, no horse traffic is allowed; motor propelled vehicles alone being permitted in some leading thoroughfares, on the score chiefly of the fact that they lend themselves to perfect ease of control, a fact which, if recorded the prominence it deserves, would dissipate much of the unnecessary apprehension which an ignorance of the motor so often creates.

Krugersdorp Trapping Crusade.

The Krugersdorp police were busy last week-end trapping unwary motor car drivers and motor cyclists, with the result that quite a batch of delinquents were arraigned on the charge of exceeding the speed limit. Excepting one instance, the offenders were all driving at a pace of over 20 miles per hour, and were mulcted *pro rata*. Beyond benefiting the various municipal exchequers, it would seem no real good is accomplished by the system of trapping, and the official zeal exercised might achieve more satisfactory results were a measure of it directed towards the coloured drivers of trollies who at all times glaringly contravene the by-laws governing street control. These pests, who swing their teams across the advance of motor cars and other vehicles, without the slightest warning, and career out of side streets at a great speed, constitute a source of imminent danger to all other road users, which, by the way, seems to escape the notice of the authorities to a marked extent, but is never the less a source of constant worry to the motorist.

Municipal Motor Wagons.

The favour with which the Municipality views motor traction in its various forms is again emphasised by the decision to introduce motor-tip wagons for the removal of refuse. At present several hundred mule carts are engaged on this very necessary service, but the economy and efficiency which the motor will combine in a service of this nature will no doubt amply justify the experiment. Another important feature of the adoption of this system will be the employment of white drivers, and the Council, who for long have recognised the value of motor traction, are certainly to be congratulated on the wisdom of this their latest decision. The wagons, it may be mentioned, will be of the well-known Lacre type of some 40 horse-power, and are expected to be in use at an early date.

Car Heating.

Car heating has been responsible for a number of appliances, with much claim to recommendation, finding their way on to the motor market, and although heaters may not be considered as a *sine qua non* in regard to cars in these parts, as is the case in colder climates, their use during the approaching cold season adds appreciably to the comfort of the occupants of a car. It is pointed out that the warming of motors in the case of the closed-in vehicles is approved by the medical profession, while the use of heaters in the open touring type of car is condemned by them, on the principle that keeping one extremity of the body warm by artificial means, while the other is exposed to the sharp, cold elements is a proceeding highly prejudicial to health, and irrational in effect. It is evidently a moot point, which must be left to the motorist to decide.

INVESTORS' DIARY.

The following company meetings have been announced:—

May 22.—Apex Mines; New Kleinfontein.
May 23.—Benoni Consolidated; Crown Mines; National Bank (at Pretoria); Rose Deep.
May 28.—Geldenhuis Deep; Durban Roodepoort Deep
May 29.—Robinson G.M. Co.; New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.: New Unified; Van Ryn Deep; Government Areas: Glencairn; Bantjes Consolidated Mines.
May 30.—Village Deep; City Deep.
June 4.—Ferreira G.M.; Modder B.
June 5.—Rand Mines.
June 7.—General Mining and Finance Corporation.
June 21.—New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.
June 26.—Transvaal Consolidated Lands.
June 28.—A Goerz & Co.
July 19.—Transvaal Consolidated Lands.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

New Cape Companies.

REGISTERED DURING APRIL, 1912.

De Afrikaanse Koerant Maatschappij Beperk.—Registered office, Capetown. Directors: F. W. Reitz, A. C. A. van Rooy, F. H. Dormehl, J. H. Marais and C. Zinn. Capital, £5,000. Registered April 6th.

The Matatiele Newspaper Co., Ltd.—Registered office, Matatiele. Directors: C. E. Pope, W. K. Punshon, J. Blampied, J. Hutt, E. B. D. Hargreaves, C. T. H. Jones, and H. L. Hargreaves. Capital, £2,000. Registered April 9th.

Karl Schwarz & Co., Ltd.—Registered office, Capetown. Managing director, Karl Schwarz. Capital, £5,000. Registered April 17th.

Honiball's Medicine Co., Ltd.—Registered office, Port Elizabeth. Directors: J. B. Levin, O. J. Oosthuizen, J. I. Ferreira, O. R. Larsen and A. J. Sellick. Capital, £2,000. Registered April 30th.

Fisher's Elite Bioscope (Wynberg), Ltd.—Registered office, 50 Church Street, Capetown. Directors: A. M. Fisher, S. Sebba and J. Fisher. Capital, £550. Registered April 26th.

CHANGE OF STYLE.

The Premier Gate, Fence and Seed Co., Ltd., to The Premier Gate, Fence and Wire Co., Ltd. Registered office, 26 Hout Street, Capetown. Registered April 4th.

REDUCTION OF CAPITAL.

The Transvaal Suburban Estate Co., Ltd., from £20,000 to £7,000. Registered April 6th. Registered office, Main Street, Port Elizabeth.

INCREASE OF CAPITAL.

Wm. Dawson & Sons (South Africa), Ltd., from £2,000 to £10,000. Registered office, 29 and 31 Long Street, Capetown. Registered April 26th.

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Instructive Figures.

Before the recent Select Committee on Public Accounts, the Auditor-General gave figures showing the cost of certain blue-books printed at the Government Printing Works in Pretoria, as compared with what they would have cost had they been printed by the Government Printing Contractors in Capetown at the existing contract rates. The Assistant Controller and Auditor-General's report on the South African Railways and Harbours Accounts, which cost £185 8s. 9d. would have cost in Capetown £95 0s. 3d., or 95 per cent. less; the Public Service Commission's Report, which cost £69 16s. 3d. would have cost £57 10s., or 21 per cent. less; Professor Marais' pamphlet on Education in Denmark, which cost £39 14s. 11d. would have cost £29 10s., or 35 per cent. less; Annual Schedule of Pensions, which cost £158 19s. 3d. would have cost £144 6s. 3d., or 10 per cent. less. Report of the Commerce and Industries, which cost £182 4s. 3d., would have cost £110 12s. 3d., or 65 per cent. less; the First Report of the Financial Relations Commission, which cost £116 0s. 9d. would have cost £54 9s. 3d., or 113 per cent. less; and the Controller and Auditor-General's Report, which cost £523 18s. would have cost £360 7s. 11d., or 45 per cent. less.

In giving evidence before the Tuberculosis Commission last Saturday, Dr. Frew, of the joint hospitals of the Witwatersrand Deep and Knight Central, furnished statistics respecting the tribal and territorial incidence of disease among natives. After having described the system employed in regard to the inspection of those mines, he said that in his experience there was no difficulty in getting white men to use sprays. The Medical Inspector appointed by the Government in April, 1911, had made occasional visits to both mines. He did not go below ground, but inspected the surface workings. Unless the Medical Inspector went down once a fortnight, witness did not think he could keep in touch with the state of affairs. It would not be possible for one man to supervise all the mines on the Reef. He thought that the Medical Inspector would require the assistance of both qualified medical men and sanitary inspectors. The Medical Inspector served a very useful purpose in seeing that the water supply and the sanitary arrangements were good, and would also exercise an important function in making recommendations concerning health matters.

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The Week's Company Meetings.

WITWATERSRAND DEEP.

Life of about Thirteen Years.

Water and Capital Expenditure.

Mr. Dawe's Review.

The fourteenth ordinary general meeting of shareholders of the Witwatersrand Deep, Limited, was held on Friday, the 10th of May, in the board-room, Cullinan Buildings. Mr. W. H. Dawe presided, and there were also present Messrs. A. Mackie Niven, H. W. Anderson, M. Honnet, A. G. Gill, O. Scheuermann, J. E. Allingham, W. T. Graham, E. Rothschild, J. Berry, and H. Panchaud, secretary, representing 58,723 shares out of an issue of 550,000.

The Chairman's Speech

The Chairman said: This meeting was convened for the 8th of March, but was adjourned to this date in order that the reports and financial statements could be circulated among European shareholders in time for them to have an opportunity to consider the same before the holding of this meeting. In future the annual meetings will be held in the month of May of each year, as the company's articles of association have been altered so as to allow us to hold the annual meetings at a later date than has been usual hitherto. The reports and financial statements give the fullest information in regard to the position of the company at the end of the financial year, that is, on the 31st of December last. It is left for me to briefly review the work accomplished during that period, and to give you an outline of the company's position to-day.

A Troublous Year.

It is not necessary for me to remind you that the time which has elapsed since the last annual meeting has been a period of great anxiety, the reason being the trouble which we have had with water. In March, 1911, I referred to the unavoidable restriction in development work on account of our having to deal with a large inflow of water. At that time the erection of the extensive pumping plant with which your company is provided was nearing completion, and your directors confidently expected that as soon as that plant was finished development work would be resumed on the 15th, 16th, and 17th, and 18th west drives, and in the east incline shaft, and that rapid progress would have been made; unfortunately our expectations in that respect were disappointed. In the first place, when development was resumed on the 12th and 13th levels it was found that a small dyke had caused an upthrow, and consequently, instead of being able to develop on the reef at once, exploitation work had to be started for the purpose of locating the ore body. This was accomplished eventually, but it took time, and while this work of locating the reef was in hand the trouble with the water increased. Though the increase in the volume of water which had to be dealt with at that time was considerable, there was nothing to lead us to expect the huge volume of water which we encountered in putting in a crosscut to locate the reef on the 16th level, where, though all precautions had been taken, the inrush was so strong that part of the wall was carried away, and, as you are aware, the pumping station at the 18th level completely flooded.

Inrush of Water.

It is a most difficult matter to convey anything like a clear idea as to the nature of the formation which was the cause of the trouble, but your consulting engineer has endeavoured to make the position as clear as possible in his report. The chief point to bear in mind is that the water had been held back by a dyke, and that on the south side of the dyke it has accumulated in basins. The water dyke has to be cut through on each level in order to reach the reef, which is south of it. The fact that the water accumulates in basins or reservoirs accounts for the consulting engineer's statement: "That it is necessary to draw off the water from each level—starting from the 14th—that is to say, the work of development on the 15th level cannot be undertaken until the flow from the 14th is much reduced, and work on each level in depth must be delayed in turn until the water from the level above has been mastered." I have dealt with this point at some length, because it is essential that it should be understood in order to be in a position to follow the company's operations. At the 16th level, where the greatest inrush occurred, a wall was constructed and the water has been gradually drawn off through pipes. The position to-day is that whereas the pressure at this level at the time the inrush occurred was 265 lbs. per square inch, it has now been reduced to 50 lbs.; the 14th level has been completely drained, while the water at the 15th has been so reduced as to be practically a negligible quantity, and it has been possible to resume development on that level south of the water dyke.

The Year's Operation.

Before touching on the more recent development I will refer to the results of the past year's working: The tonnage crushed during the year amounted to 500,330 tons, as against 474.660 tons during 1910; but the profit was somewhat less than for the previous year, being £301,542, as against £323,413. Reference to the tabulated statements issued with the reports will show that during the last three months of the year there was a considerable decrease in the tonnage milled, and also that the grade of the ore milled was somewhat lower, and these differences are accounted for by the fact that operations were very much hampered, as it was at that period that the great increase in the water took place. A most important factor, however, in connection with the smaller profit was the increased cost of native labour—that is, higher wages and recruiting expenses, which amounted to practically 1s. per ton, and that, unfortunately, without increased efficiency. The appropriation account is summarised in the directors' report, and from it you will see that the credit balance brought forward from last year amounted to £35,178; profit on working during 1911 £301,542, and interest, sundry revenue, etc., £1,975, giving a total credit of £338,696. Dividend No. 11 of 25 per cent., absorbed £137,500, and No. 12, of 10 per cent. £55,000, and after allowing for the Government tax on profits, interest on debentures, redemption of debentures, capital expenditure, etc., a balance of £71,793 was brought forward to the credit of this year. In connection with the dividend of 10 per cent. which was declared in December last, I wish to refer to the statement which was published at the time, namely, that it would have been possible to have declared a higher dividend, but in view of the uncertainty of the position occasioned by the water difficulty, your directors were of opinion that it would have been a most unsound policy to have distributed all the company's cash assets. The extent of the difficulty encountered could not be estimated, and therefore it was impossible to tell how long the work of the company was likely to be hampered or delayed. Your directors fully realised that the declaration of a reduced dividend was the cause of serious disappointment to shareholders, but they feel confident that—with a knowledge of the circumstances—shareholders will have realised that the course adopted was in their best interests. Your directors felt that if they were called on to deal with still greater difficulties, their position would be most unenviable if the company were without funds; and they also realised that the development might be delayed for an indefinite period, in which case it was desirable to place the company in a position to increase the ore reserves as soon as it was possible to resume development on a normal basis. I feel sure that in regard to this decision, directors have the support of shareholders. Referring for one moment to the question of working costs, pumping expenses have formed no inconsiderable item, namely, £3,600 per month, and I am pleased to be able to inform you that contracts were entered into for the supply of water to other mining companies, with the result that at the present time the revenue derived from the sale of water averages over £900 per month, which amount is likely to be increased. The present capacity of the pumping plant is three and a quarter million gallons per diem.

Ore Reserve.

The next point is in connection with the ore reserves, which, at the 31st December last, stood at 1,436.202 tons, of an average value of 6.79 dwts. over 48.6 inches, as compared with a total, on the 31st of December, 1910, of 1,692.922 tons at 7.16 dwts. over 48.8 inches. The ore developed during the year amounted to 117,797 tons, of a value of 6.14 dwts. over 53.3 inches, and, obviously, the inclusion of this tonnage contributed to the decreased value of the reserves at the end of last year as compared with those of the previous year. The tonnage developed was chiefly in the eastern and western portions of the property, where the values, taken as a whole, have previously been lower than those obtained from the central portion of the property, where no development could be undertaken during the period under consideration. It is extremely difficult to forecast the amount of development which it will be possible to accomplish during the current year. An estimate has been made by the manager, and approved by the consulting engineer, but this, of course, is based on the assumption that no unexpected delay will be occasioned by the water, and, assuming that the area exposed will average 48 inches of payable ore. If we be fortunate enough to realise these conditions, it is thought that we might reasonably expect to develop between 300,000 and 400,000 tons. I give you this estimate for the purpose of showing what we hope to do, and what we think we shall do with reasonable luck, but you will realise that the circumstances governing this work are beyond our control. If our estimate be realised, the reserve at the end of the current year will not be further decreased to any great extent. Fortunately the reserve tonnage is sufficiently large to bear an extra strain of this nature; and a sum has been put aside for the purpose of undertaking an amount of development in excess of what might be considered the normal amount as the opportunity occurs. This amount, at the 31st December, stood at £3,790, but it has since been added to and will be further increased during the current year, so that though the ore reserves might show some further diminution the company will have provided the funds necessary to make up the reduction.

Capital Expenditure.

The capital expenditure for the year, after allowing for an amount realised on buildings and a refund on account of Witwatersrand Native Labour Association shares, amounted to £33,236; £18,945 of this is represented by shaft sinking and £17,229 for machinery and plant, most of which formed part of the pumping equipment. The estimated capital expenditure for the current year is £20,000, exclusive of shaft sinking. I now come to the position of affairs at the present time, and, in making this reference, I should like to emphasise the fact that my task is one of considerable difficulty, because I realise that, while it would be easy to under-estimate the difficulties which have still to be overcome, it is equally easy to err in the opposite direction. I would, therefore, ask you to be good enough to accept my statement as an effort to place you in possession of all the information at my disposal, leaving it to you to assess the measure of importance to be attached to the various details of information given. I have already told you of the position in regard to the water in the 14th, 15th and 16th levels, and you will realise that the decrease on these levels has relieved the management of very considerable anxiety. The position during the last two months has so far improved that we are now able to gauge the extent of the difficulty with which we have to cope, whereas previously we could not tell whether the inrush would not further increase. In addition to that our knowledge of the value of the reef south of the water dyke was confined to the results obtained from two boreholes; one which intersected the reef on the 16th level, where the value was 10.1 dwts. over 51 inches, and the other which intersected the reef on the 18th level, where the value was 12.5 dwts over 65 inches. As soon as the water had sufficiently decreased on the 15th level driving on the reef was commenced, and to date 205 feet, driven east and west, have given an average value of 12 dwts. over 56 inches. It is expected that by the end of six months the water will be sufficiently drained off the 16th level to allow driving to be commenced.

Labour Supply.

In connection with the labour supply your company was hampered to some extent towards the end of the financial year, but I am pleased to say that it has benefited by the more plentiful supply which has been available during the last few months. The management has been particularly successful in connection with the Central African natives. A large number have been employed by your company, with most satisfactory results, as the natives have proved competent workers. The mortality for the year for this class of labour averaged 30.1 per thousand, or 33.6 if we include accidents. As I have pointed out on several previous occasions, your property is one which can be worked to much greater advantage by hand labour than by machine drills. This fact, however, has not prevented us from using a certain number of machine drills, and from making continuous trials of the different kinds of drill in order to ascertain which is best suited for our purpose. We do not lose sight of the fact that the labour supply is always more restricted during the winter months; and, though machine drills are not as satisfactory in this case as hand labour, we realise that we must be prepared to use them to compensate for any reduction in the number of natives employed.

Life of the Mine.

I have been asked by shareholders to make some reference to the life of the mine, as I did recently in the case of the Wolhuter Gold Mines. On that occasion I pointed out the difficulties which exist in making an estimate of this nature, and emphasised the fact that at best any figures could only be regarded as an assumption, seeing so much depends on the width and the value of the reef still to be developed. This remark applies specially in the case of your company, as so little is known of the large area in depth, whereas in the case of the Wolhuter Gold Mines we had considerable data from surrounding companies to guide us. In the directors' report there is a clerical error, which has to be corrected, where the actual claim area is given as 414.5, instead of 404.5, as no change has taken place in the company's property holding. Having made these reservations, I submit the following estimate:

AREA.

Witwatersrand Deep, 276 claims, equal to actual area of 273.71 claims; portion of Driefontein Deep, 132 claims, equal to actual area of 25.07 claims; 8 claims, equal to actual area of 5.72 claims; total, 416 claims, equal to actual area of 404.50 claims.

DEVELOPED AREA TONNAGE.

Ore reserves at the 31st of December, 1911, 1,436,202 mining tons; less sorting, say, 12 per cent., 172,344 mining tons; standing ore reserves at the 31st of December, 1911, 1,263,858 milling tons; tons milled to the 31st of December, 1911, 3,000,381; total milling tons from total developed area at the 31st of December, 1911, 4,264,239.

DEVELOPED AND UNDEVELOPED.

Witwatersrand Deep Old Area.—Area Wit. Deep, not including Driefontein Deep, 273.71 claims; plus overlap due to East Rand Dyke, say, 12.00 claims; total reef bearing area (old Wit. Deep), 258.71 claims; less area transferred to Witwatersrand G.M. Co., 2.88 claims; remaining reef bearing area (old Wit. Deep), 282.83 claims. Area developed (old Wit. Deep) at the 31st of December, 1911—north of E.R. Dyke 46.96 claims, south of E.R. Dyke 115.92 claims—162.88 claims; area remaining undevelpeed (old Wit. Deep) at the 31st of December, 1911, 119.95 claims, Portion Driefontein Deep.—The entire area is undeveloped in Driefontein Deep, 125.07 claims.

UNDEVELOPED TONNAGE.

Witwatersrand Deep. — If 162.88 claims (developed) yield 26.180 tons per claim, 4,264,239 milling tons, then 119.95 claims (undeveloped) should yield 3,450,000 milling tons, less, say, 10 per cent. for flattening dip, 314,000 milling tons; estimated milling tons to be obtained from Wit. Deep undeveloped area, 2,826,000.

Driefontein Deep.—Area from Driefontein Deep, 125.07 claims; milling tons (as per Wit. Deep 26,180 x 125.07), 3,274,332; less, say, 15 per cent. for flattening dip, 491,149; total, 2,783,183; less, say 15 per cent. safety factor, 417.477; estimated milling tons which will be obtained from Driefontein Deep, 2,365,706.

SUMMARY.

Ore reserves standing Wit. Deep, 31st December, 1911, 1,263,858 milling tons; to be obtained from Wit. Deep undeveloped area, 2,826,000 milling tons; to be obtained from Driefontein Deep undeveloped area, 2,365,706 milling tons; estimated milling tons to be obtained from Wit. Deep total area after 31st December, 1911, 6,455,564.

Milling at the rate of 500,000 tons per annum will exhaust this tonnage in 12.91 years, say 13 years. In this estimate 8 claims on Driefontein, which have an actual area equal to 5.72 claims, have not been included, as this area can only be worked in conjunction with the portion of the water-right situate on the southern boundary of your company's property. Your board is carrying on negotiations with the Government at the present time for the right to mine under the portion of the water-right referred to.

Miners 'Phthisis.

There is another subject of great importance to the mining industry to which I must make reference—that is, the Miners' Phthisis Bill which is being dealt with by the Union Parliament. The question is one in which the industry has such a vital interest that I consider it obligatory to refer to the attitude of the mining industry in regard to it. The President of the Chamber of Mines, at the monthly meeting of the Chamber held on the 18th April, referred to the principle adopted by the Government in the present Bill, and showed that it differed from that embodied in the measure submitted to Parliament last year, in so far as the Government has now abandoned their original intention to contribute to the compensation fund which it is intended to build up. The President of the Chamber of Mines made it clear that the representatives of the mining industry fully recognised the responsibility which rests with them, and emphasised the fact that the last thing they wish to do is evade their share of that responsibility; at the same time they have not departed from the opinion which was expressed to the Government last year, namely, that the principle which should be adopted was that of tripartite contribution. If the Government will not accept that principle I do not think the representatives of the mining industry would see any objection to a scheme which would provide that the funds necessary to compensate cases of phthisis existing at the time of the passing of the Bill should be contributed equally by the Government and the mines, and that after the passing of the Bill the contributions should be made by the mines and the employees. That the principle that the Government should make some contribution is a reasonable one is shown by the views expressed by Ministers during the discussion of the Bill in April last year, and I think the Government's recognition of the fact that a share of the responsibility rests with them is further confirmed by their contributing towards the Miners' Phthisis Sanatorium. The Select Committee appointed by the House is dealing with the draft measure, and I sincerely hope that, after considering the evidence which has been submitted to them, they will feel justified in recommending that the principle of a Government contribution shall not be wholly departed from. It is to be regretted that the measure proposed deals with the question of compensation, and suggests no measures for mitigating the disease. As the Bill - framed in the interests of the miners it appears to me that some effort should be made to prevent men who have contracted the disease from continuing to work until there is no hope of recovery. As it stands the draft Bill is a bald measure, offering compensation as the sole panacea to those suffering from the disease, but making no remedial provision; and a greater contrast to the statesmanlike measure passed by the Australian Government could not be easily found. I fully endorse the remarks of the President of the Chamber of Mines, when he said: "that it was for every one concerned to assist as far as opportunities go in framing an equitable measure for the relief of the evil which has gradually arisen, and to take every step in his power towards its lessening and its eradication, if possible," and I feel sure that those interested in the mining industry will work loyally towards that end. The Phthisis Committee, which comprises Government representatives, engineers, medical men, mine managers and miners, has been carrying out very thorough investigations and experiments, with the result that several members have confidently expressed the opinion that it is possible to stamp out the disease. No doubt it will take some time to achieve that much-to-be desired result, but the fact that competent authorities take so hopeful a view should be—and I am sure will be—an additional incentive to all concerned to redouble their efforts to take every opportunity to attain the object in view. But it is obvious that this result would be more thoroughly and quickly attained if the Miners' Phthisis Bill provided for the medical examination of employes.

In conclusion, on behalf of the Board, I wish to express the appreciation of the services rendered during the past year by the consulting engineer, Mr. S. C. Thomson, and your manager, Mr. E. E. Hardach. It has been a period of strenuous work and anxiety for the manager and his staff, and your directors fully appreciate the manner in which they have dealt with the difficult situation.

I now beg to formally move the adoption of the reports and accounts, as submitted.

The report and accounts were adopted.

Messrs. A. Mackie Niven and C. S. Goldman, retiring directors, were re-elected.

The auditors, Messrs. John Moon and Thomas Douglas, were re-appointed.

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Contracts Open.

The Natal Tender Board invites tenders for the reconstruction of Gourton bridge over Little Tugela River, Estcourt-Bergville Road (May 20): also for the erection of a bridge over the Amatikulu River, M'tunzini Division (May 27).

The Orange Free State Tender Board invites tenders for the erection of a bridge over the Valsch River at Bothaville (May 21); also for the supply of forage to the S.A. Police in O.F.S. (June 5).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of fencing material and gates (May 28).

The Municipal Council of Johannesburg invites tenders for re-filling broom stocks (May 22).

The Municipal Council of Johannesburg invites tenders for mackintoshes (June 1); also spares for stone crusher (June 11).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for structural steelwork, etc., for new foundry at Pretoria (June 4); also for disinfectants (May 21); also for the supply of 876 Petersburg standards of Baltic timber (May 21).

The Secretary to the Tender Board, S.A.R., Headquarter Offices, Johannesburg, invites tenders for the supply of 2,741 Petersburg standards of Baltic timber (June 11).

The Rand Mines, Ltd., Buying Department, Box 1591, Johannesburg, invites tenders for the supply of the whole or any portion of the requirements of mealies to the Companies controlled by the Rand Mines, Limited, for a period of twelve months from 1st July, 1912.

The Municipality of Boksburg invites tenders for the supply of rolling stock, converter plant, and overhead material, required in connection with trackless tramways (June 26).

The Potchefstroom Municipality invites tenders for the supply of 750 Braime's No. 8 steel sanitary buckets (May 27).

The Chairman of the Union Tender Board, Pretoria, invites tenders for the supply of beans, bread, coal, wood, lime, mealies, meal, fresh meat, paraffin, salt, soap (Colonial), mixed vegetables, potatoes, and general groceries to the Union Prisons Departments, the period commencing 1st July, 1912, and ending 31st March, 1913 (May 29).

The Chairman of Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for the erection of boarding-house, Girls' High School, Pretoria (June 7).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of Oilskin Capes and Mackintosh Overall Leggings to the Department of Posts and Telegraphs during the period 1st July, 1912, to 31st March, 1915. The approximate annual requirements are 500 black oilskin capes and 500 black mackintosh overall leggings (June 5).

The Chairman of the Tender Board, Provincial Secretary's Office, Bloemfontein, invites tenders for the erection of a bridge over the Valsch River at Bothaville (May 21); also for the erection of a bridge over the Leibenberg's Vlei River (May 28).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the erection of new public offices at Murraysburg; also for repairs to Residency at Murraysburg; also for repairs to public offices and residency, Richmond, and repairs to gaol at Richmond (May 22).

The Municipal Council of Salisbury invites tenders for materials to be supplied and work to be executed in the construction of a reinforced concrete covered service reservoir, high level tank, etc. (May 22).

The Town Clerk of Clocolan, O.F.S., invites tenders for the erection and completion of a water scheme at Clocolan (May 31).

The Chairman of the Tender Board, Attorney-General's Office, Pietermaritzburg, invites tenders for the reconstruction of Gourton Bridge over the Little Tugela River, Estcourt-Bergville Road (May 20); also for erection of a bridge over the Amatikulu River, M'tunzini Division (May 27).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of oils (June 11); also for asphalt paves (June 4); also for bridgework to form extension of foot bridge, Witbank (June 11); also for the supply of 36,000 casks of Portland cement (June 18); also for the supply of writing and printing paper, boards, etc. (June 9); also for certain earth works, masonry and concrete, including a short tunnel, in the Sand River Poort, on the Bandolier Kop-Messina railway (May 23).

The Rand Water Board invites tenders for the supply and delivery of departmental stores for the year ending 30th June, 1913, or for such time as agreed upon (May 23).

The Municipal Council of Johannesburg invites tenders for the supply of second-hand steel rails, 45lb. section (May 21).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the following services, viz.: Fencing at the Leper Asylum (June 5): erection of police buildings at Bushbuckridge, Maviljen No. 250 (June 12); drainage system and sewerage purification works at the Asylum, Fort Beaufort (June 12).

The Chairman of the Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for the following services in the Transvaal Province: Erection of boarding house, Girls' High School, Pretoria (June 7); additions to male surgical ward at the Boksburg Hospital (June 7); erection of a surgical and medical ward and operating theatre for female natives at the Boksburg Hospital (June 7).

The Chairman of the Tender Board, Attorney-General's office, Pietermaritzburg, invites tenders for the following services in the Natal Province: Erection of a bridge over the Amatikulu River, M'tunzini Division (May 27); erection of a school building at Paulpietersburg (June 3); erection of a bridge over the Slang River (June 10).

Tenders Accepted.

S.A. Fertilisers Company, for the supply of the following to the Horticultural Division, Experimental Station, Warmbaths: Sulphate of potash, £11 10s. per ton; high-grade superphosphate, £4 per ton; bone meal, £6 per ton; and nitrate of soda, £11 5s. per ton.

Crawford & Lobban, Turffontein, Transvaal, at £9,657, for erection of boarding-house at Jeppe High School; Karl Heyne, Rustenburg, at £1,552, for erection of school and quarters at Rhenosterhoek No. 264, Rustenburg, Transvaal, at £645, for erection of school at Rhenosterfontein No. 546, Rustenburg, Transvaal, at £1,802, for erection of school and quarters at Rietfontein No. 299, Rustenburg, Transvaal; H. Ward, Uitenhage, at £1,021 18s., for new water supply at the Grahamstown Asylum; Sutherland & Co., Volksrust, at £1,799, for additions to school at Volksrust; J. G. Kinnell, at £648 10s., for erection of charge attendants' quarters, Fort Beaufort Asylum, Fauresmith. J. D. Wall, at £388, for erection of new cells at Jagersfontein Police Barracks; G. F. Warren, Potchefstroom, at £1,135, for erection of school for 100 pupils at Witpoort (Lot No. 121), Wolmaransstad.

Tenders have been accepted from the following for various services:

Pretoria.—Messrs. Orkin Brothers, Limited, B. Gundelfinger, South African Coal Company, W. Francis & Sons, A. Johnston & Co., African Indent Merchants, Ltd., Torrance & Crawford, V. S. Simpson, Vacuum Oil Company, Ltd., J. M. Robinson, S. Kantor, British South African Explosive Company.

Pretoria, Johannesburg, Bloemfontein, Maritzburg, and Durban.—Stewards & Lloyds, Ltd., for tubes and fittings, pumps, etc.

Johannesburg.—B. Gundelfinger, African Indent Merchants, Ltd., Randles Bro. & Hudson, T. W. Beckett & Company, Ltd., Vacuum Oil Company, Ltd., Middelburg Coal Agency, Gilbert & Co., W. Hosken & Co., Belfast Warehouse Company .

Germiston.—Bagley & Steventon.

Maritzburg.—J. A. Peters & Co., E. Turnbull & Co.

Capetown.—G. Findlay & Co., James Robertson & Co., J. G. Steytler & Co., C. Starke & Co., Imperial Cold Storage and Supply Company.

Electrical Fittings.—A.E.G. Electrical Company, Siemens, Ltd., British General Electric Company, Ltd., Hubert Davies & Co., Henley's S.A. Telegraph Works, Ltd., Telegraph Manufacturing Company.

Orenstein, Arthur Koppel, Limited, for 6,000 feet steel piping, at 11⅝d. per foot.

For services to Government Laboratory, Onderspoort, Pretoria.—Torrange & Crawford, Louis Favre, Vacuum Oil Company, Goldblum & Glass, W. Francis & Sons, Greatrox, Ltd.

For services to Department of Native Affairs.—Rand Cold Storage, Johannesburg; Transvaal Cold Storage, Pretoria; Frenkel & Co., Johannesburg; Middelburg Coal Agency, Johannesburg; Orlek Brothers, Pretoria; Randles, Bro. & Hudson, F. S. Frank, Germiston; African Indent Merchants, Ltd.

For supplies to Department of Agriculture.—S.A. Fertilisers, Ltd., City Meat Company, E. Turnbull & Company, Steel, Murray & Co., Rand Rubber and Asbestos Company.

For the following supplies to the Sheep Stud Farm, Ermelo.—S.A. Fertilisers Company, nitrata of soda, at £11 5s. per ton; bone meal, at £6 per ton; Woodhead, Plant & Co., basic slag, at £3 5s. per ton and high-grade superphosphates, at £3 15s. per ton; W. A. Joubert, meat.

P. W. S. Birnie, Krugersdorp, at £1,405, for school and quarters at Boschfontein No. 607, Rustenburg; J. H. Dickinson, Vereeniging, at £575, for school and quarters, Rietfontein No. 271, Potchefstroom; G. F. Warren, Potchefstroom, at £1,438, for school and quarters at Proposal No. 203, Bloemhof, at £1,939, for school and quarters at Koedoesfontein No. 12, Potchefstroom, at £860, for teachers' quarters at Geysdorp, Lichtenburg, at £895, for teachers' quarters at Doornbult No. 197, Lichtenburg, at £1,799, for school and quarters at Wolvespruit No. 65, Wolmaransstad, at £2,194, for school and quarters at Elandskuil No. 110, Ventersdorp, at £595, for school at Rooipoort No. 380. Ventersdorp; J. Dunn & Co., Krugersdorp, at £805, for teachers' quarters, Leeuwfontein No. 656, Ventersdorp; Osborne, Thompson & Co., Zeerust, at £1,763, for school and quarters at Cyferfontein No. 299, Marico; Douglas, Son & Pugh, Johannesburg, at £153 2s. 6d., for supply of sanitary fittings, Pietermaritzburg Asylum; Poynton Bros., Pretoria, at £312 12s. 10d., for supply of sanitary fittings, Pietermaritzburg Asylum; T. W. Beckett & Co., Ltd., Pretoria, at £1,796 17s. 6d., for supply and delivery of fittings and fixtures, New Government Offices, Bloemfontein; P. W. S. Birnie, Krugersdorp, at £978, for erection of police buildings at Mooifontein, Bloemhof; J. S. Hancock & Co., Johannesburg, at £372 13s., for supply of sanitary fittings, Pietermaritzburg Asylum; Parker, Wood & Co., Johannesburg, at £333 13s., for supply of sanitary fittings, Pietermaritzburg Asylum; C. Polto, Pretoria, at £2,319 3s. 6d., for erection of bridge over the Libenbergs Vlei River, District Bethlehem, Orange Free State; Tyler & Sons (Colonial, Ltd.), Durban, at £80 for supply of sanitary fittings, Pietermaritzburg Asylum.

For the supply of uniforms, etc., to the Customs Department.—A. Fraser & Co., Capetown, uniforms A, at £2 10s. 6d.; uniforms B., at £2 2s. 3d. per uniform; overcoats, at £1 4s. each; caps, at 6s. per cap; leggings, at 5s. 9d. per pair; M. Eilenberg & Co., Ltd., Capetown, mackintoshes, at £1 8s. 7d. per garment; University House, Durban, boots, at 6s. 9d. per pair.

For supply of forage and other stores to the South African Police during the period of twelve months commencing the 1st April, 1912.—Warder & Bredell, B. Mendelsohn, Ltd., Malcomess & Co., Middelburg Coal Agency, C. W. Champion, Pretoria Coal Company, W. G. Lay, E. J. Adcock, Heynes, Mathew, Ltd., Phillips & Co., Ltd., T. E. Jolly & Co., B. Owen Jones, Ltd., Lennon, Ltd., Lyle Brothers, Wevell Brothers, Hannam & Co., Parker, Wood & Co., African Indent Merchants, A. Johnston & Co.

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Notes and News.

A Rich Strike.

We understand that a rich strike of quartz carrying visible gold over a good distance has been made in German East Africa, and that a considerable area has been pegged by the fortunate finders. The discovery was made in a peculiar manner. Owing to the quartz being used for ballasting, it attracted attention and was traced to its origin. A small syndicate with £1,000 capital, has been formed, the working capital being many times over-applied for. We hope to print full particulars in an early issue.

* * * *

A Question of Title.

Our attention has been drawn to a circular referring to a publication entitled "The South African Mines and Rhodesian Settlers' Guide, or "Mines of South Africa and Rhodesian Settlers' Guide." Owing to the similarity of title with the second name of this journal, "The S.A. Mines, Commerce and Industries," it may be well to draw the attention of the public to the fact that the publication in question has no connection, either directly or indirectly, with this paper or with any member of its staff.

* * * *

Our Special Issue.

Owing to delay in the arrival of supplies of paper, caused by the strike in Great Britain, and for other minor reasons, it has been decided to postpone the issue of the Special Majority Number of this journal—which will be separate from the ordinary weekly issue—until July. This will have the additional advantage of making it possible to include in the issue complete annual reviews of the results from all the mines, as by then the last of the postponed annual meetings of Rand companies will have taken place. Those contributors who had not yet sent in their promised articles will note that the delay gives them the desired time to apply the finishing touches to their work. In case we have overlooked acknowledging receipt of any articles sent in, we take this opportunity of thanking their contributors.

* * * *

Mine Costs.

In another part of this issue is reprinted a paper which was read at the last meeting of the Chemical, Metallurgical and Mining Society, by Mr. C. Hildick Smith, on the collecting and tabulating of data relating to the efficiency of underground workers. The feature which will most attract attention in this contribution is not the author's excellent method of recording essential data so much as his sweeping condemnation of prevailing methods in this direction. It does not require superhuman effort nor an uncommon measure of intelligence to arrive at the cost of any particular kind of work underground, and, since the low grade conditions of the Rand demand that this aspect of mining should be sufficiently considered, it is not to be doubted that an adequate system of cost keeping has long since been devised for the purpose by every group concerned. Mr. Hildick Smith would have us believe that there prevails a want of system and general incapacity in the matter of allocating costs, which is deplorable, and his position as a responsible employee of the Corner House adds weight to a statement that might otherwise be disregarded.

* * * *

Iridosmine in the Rand Banket.

In view of the diverse opinions which are held with regard to the origin of gold in the Rand Banket beds, a subject that has been far from receiving the attention which its importance deserves, the paper by Mr. C. Baring Horwood, which is concluded in this issue, should prove of more than ephemeral interest. It suggests a line of thought and investigation which may be followed up with profit while it records facts which are probably little known even to geologists who have made a special study of the Witwatersrand formation. Mr. Horwood has for many years past made a very close study of our banket reefs, and in his capacity as a mining engineer he has had exceptional opportunities for so doing. He has given us many important results of his investigations in several scientific papers. There is one point in his present paper to which we would particularly like to call attention: he boldly states that the Rand bankets differ in no important *essentials* from ordinary quartz veins; that they have, in fact, merely acted as the channels in which mineralising solutions have circulated and deposited mineral matter; and, these channels have finally become closed to further mineralization by the deposition of secondary silica, in a similar manner to that in which ordinary quartz veins have become sealed by the deposition of vein quartz and other gangue material, or vein stuff. Further, he clearly points out that we have abundant evidence of former deep-seated communications with these channels, whence the mineralizing solutions may have come, in the presence of the big diabase dykes which are so common in nearly all the mines of the Rand. Thus in two sentences we have presented in a clear, concise and convincing manner a refutation of the placer theory of the origin of the gold in the Rand bankets, which latter was advanced, it will be remembered, in a masterful way, by Professor Gregory about four and a half years ago in a paper read before the Institution of Mining and Metallurgy in London. That paper was the result of a flying visit which he paid to this country when the British Association held their annual meeting here in 1905; and of information gathered, according to his own showing, second-hand on that occasion.

* * * *

The Late Mr. H. F. Julian.

The arrival at New York of the Carpathia substantiated the sad news that Mr. H. Forbes Julian was counted among the missing passengers on the ill-fated Titanic. The metallurgical engineers of the world and a host of friends have lost a brilliant yet most modest comrade. From 1886 to 1893 he began his career of usefulness, acting in a consulting capacity for mines at Barberton, Johannesburg and Kimberley, superintending the opening of mines and the erection and operation of mills and reduction plants. From 1893, as technical adviser on mining and metallurgical matters to the Deutsche Gold and Silver Schiede Anstalt, of Frankfort, he conducted extensive metallurgical researches which formulated the basis of far-reaching improvements in the recovery of the precious metals from ores. Perhaps Mr. Julian was better known as the joint author of "Cyaniding Gold and Silver Ores," which as a text-book on cyanidation has proved through several editions the most widely consulted book on the subject from the date of publication (1904) to the present time. As consulting engineer to Charles Butters & Co. for the past six years, he was instrumental in developing a process which has revolutionised the metallugy of gold and silver ores. Even with the pressure of research work and active participation in the building up of this process, he found time to devote his attention to the far-reaching activities of the British Association as a member of the General Committee, and as a contributor to the work of the Chemical Section. He was one of the founders of the Royal Automobile Club, a member of the Institution of Mining and Metallurgy, of the Devonshire Association and of the Torquay Natural History Society—on the committee of which he served. Both the latter societies were founded by his father-in-law, Mr. William Pengally, F.R.S., F.G.S., whose youngest daughter, Hester, he married in 1902, and who has since resided at Redholme, Torquay, though frequently travelling abroad on scientific work. Mr. Julian's untiring energy and enthusiasm helped everyone who had the good fortune to come in contact with him, and his personal high standard of life was the admiration of all. The deepest sympathy is felt for his widow in her lamentable bereavement.

The Stanley Classifier.

A subsidiary company has been formed, we understand, to treat the old Bonanza tailings by means of the Stanley Classifier, which was described in this journal a few months ago. The original experimental plant, it may be remembered, was tried at the Robinson sands-filling site with a fair amount of success. Mr. Laurie Hamilton's report upon the prospects of the invention was distinctly gratifying.

* * * *

The Crown Mines and the Mining Regulations.

The Mines Department has come pretty badly out of its case against Mr. A. J. Brett, joint manager of the Crown Mines. Mr. Taylor, in his summing up, for the defence, said all that was necessary to be said, perhaps, from the purely legal standpoint, and the subsequent judgment in favour of the defendant was probably not a matter of surprise to anyone, even to the Mines Department. There is one aspect of the affair, however, which occurs to us to require some comment. It is the deliberate employment by the Department of officials of the Labour Party to give evidence upon matters with regard to which they can scarcely be supposed to have been unprejudiced witnesses. The evidence was doubtless absolutely unbiassed, but we must protest, nevertheless, against methods which are obviously reprehensible and which may at some time or another be altogether detrimental to the proper course of justice.

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Alluvial Tin Fields of Africa.

Further particulars are now available of this company, formed for the purpose of acquiring and further developing an alluvial tin deposit known as the Kuils River tin mine, situated 16 miles east of Capetown in the Stellenbosch district. The promoters are the group connected with the Kinta and other tin mines in the Federated Malay States, and F. Douglas Osborne, of Ipoh, Perak, is consulting engineer. The preliminary investigations were made by H. D. Day, one of the engineers on the staff of Osborne & Chappel, and subsequently Mr. Osborne proceeded to the spot. His report shows that in one block of 32½ acres, which has been carefully tested, the alluvium averages 18½ ft. in depth, and contains 972,400 cubic yards estimated to yield 4·6 lb. of cassiterite per cubic yard. Mr. Osborne is of opinion that the total net profit, with tin at £180 per ton and the concentrate assaying 72 per cent. metal, should be £210,180. There are other tracts adjoining that are promising but not as yet fully prospected. The method of working will be that usually employed in Australia and the East, that is to say, loosening the gravel by a monitor and elevating the wash by means of pumps to extraction plant on a floating barge, and subsequently returning the water to the storage reservoir. Mr. Osborne estimates that the cost of the dam and plant will be £15,775. This estimate is low, because some of the necessary machinery is already on the ground, having been provided by the Kuils River company, which did the original prospecting and development work. The capital of the new company is £100,000, of which £90,000 is now being issued; £40,000 in shares and £30,000 in cash goes to the vendors, and £20,000 will be provided as working capital. The whole of the 50,000 shares to be issued for cash have been underwritten.

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Minerals of Madagascar.

M. Lacroix, Professor in the Paris Museum of Natural History, has returned from a six months' tour in Madagascar, where he has been examining the mineral wealth of the central plateau. In the course of an interview, M. Lacroix stated that the Sakalave country in the north of the island is remarkable for the diversity of eruptive rocks. The gold mines of Andavakoera are interesting as differing from the usual compact quartz veins of Madagascar, the walls of the veinlets being coated with layers of quartz crystals in saw-tooth fashion, between the teeth of which lies an irregular mixture of quartz and crystallised gold, the latter of a pale yellow, in consequence of its silver contents. These lodes have been worked by the natives in a very primitive way, but the mines are now run on more modern lines. The central plateau was traversed by the Professor for three months from Ambositra south of Antananarivo to the lake of Alaotra north of the capital, a distance of 300 miles. Precious stones were plentifully found. In the belts of pegmatite were blue and rose beryls, also tourmalines of a beautiful gold colour, some green and others red, orange garnets and kunzites. Rose quartz and green amazonite are made into various objects. Large plates of mica having commercial value were observed. Uraniferous ores were discovered, giving rise by their decomposition to the mineral autunite. Deposits of phosphate of uranium and lime occur ordinarily in granite, but are here uniquely found in peaty alluvium, from which the little gold-coloured scales are separated by washing. Some mica schists have graphite sprinkled through them, which is extracted by means of vanning, yielding a product worth 95 per cent. Other schists enclose large nodules of pure alumina. With Canada, Madagascar furnishes the principal portion of opaque corundum. In the mountains of Itasy and Ankaral, not far from Antananarivo, are thermal wells, some containing carbonate of soda in solution.

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Ferreira-Ferreira Deep Amalgamation.

Despite some opposition, the Ferreira Mine, one of the oldest and best known mines on the Rand, is to be no more. At the special meeting last week, the Chairman, Mr. H. A. Rogers, submitted a scheme for the amalgamation of the mine with the Ferreira Deep. The scheme provided that the company should dispose of all its assets, other than a certain amount of its cash, to the Ferreira Deep, Ltd., in exchange for 70,000 Ferreira Deep shares. The shareholders will receive one Ferreira Deep share for each Ferreira share now held, in addition to a cash bonus of 10s. per share. The technical adviser to the General Mining and Finance Corporation (Mr. Stubbs) made an independent report, and he recommended that the shareholders should receive 95,000 Ferreira Deep shares and a further 4s. per share, making the proposed bonus 14s., instead of 10s. per share. The Ferreira Deep, however, refused to amend its terms. The board recommended the acceptance of the original terms. Mr. F. von Hessert, a director of the company, opposed the amalgamation on the grounds that he was under the impression that the value of the mine was more than they were getting. A poll was demanded, resulting in the carrying of the amalgamation scheme by a majority of 6,221 votes.

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Solomon's Temple Tins.

At the meeting of the Solomon's Temple Tin Mines, held on Thursday last, the Chairman, Mr. H. de V. Steytler, stated that the bond over the property had been redeemed by the debenture issue and that of the A shares which were authorised at the last annual meeting, and that a sum of about £10,500 had been left over for the payment of debenture interest and the continuance of prospecting operations. Of this amount there is available in cash about £4,500, and the monthly expenditure does not exceed £500. Prospecting operations have not disclosed pipes of lasting value, but a considerable amount of ore-bearing rock has been accumulated and disclosed which will become of value in the event of further discoveries being made which would justify the erection of a milling and dressing plant. At present investigation is being made of a sheet-like ore body which has been traced over the property for a distance of 3,500 feet or so. Some portions are rich in tin, and the analogy of the Groenfontein and Zaaiplaats sheet occurrences lead the board and the consulting engineer, Dr. Merensky, to consider that the latest developments are promising and encouraging. It is hoped that the cash in hand will suffice to provide sufficient satisfactory evidence to warrant the taking up of the options over the balance of the debentures and so enable the company to pass from the prospecting to the producing stage.

TOPICS OF THE WEEK.

POSITION AND PROSPECTS OF THE CROWN MINES.

Mr. Samuel Evans, the Chairman and Managing Director of the Crown Mines, Ltd., is to be congratulated on his singularly lucid and concise marshalling of the stupendous array of facts and figures that go to make up the statement of the Central Rand amalgamation. His speech on Thursday is a masterpiece of concentration and simplicity. It put the position of the property in the clearest possible terms, and it replies categorically to the criticisms levelled at the company. It forms a convincing vindication of the amalgamation of the Fordsburg-Langlaagte properties, and as a direct, straightforward and terse statement of the case it cannot fail to have an excellent effect in reassuring doubting Crown Mines shareholders, and all interested in Rand shares as well. Mr. Evans makes his points so emphatic and analyses his own remarks so effectively that the work of the commentator is rendered easy. He did not waste time in repeating the figures for last year, which are now ancient history. Instead he plunged at once into the much-canvassed questions arising out of those figures. He admitted that the company had been subjected to a certain amount of criticism directed mainly to two points. In the first place, it had been stated that the promises made prior to the amalgamation have not been fulfilled; and, secondly, it had been urged that the shareholders, or at any rate some of them, would have done better had there been no amalgamation. By way of refutation, Mr. Evans compared the results obtained by the Crown Mines with the estimates framed and with the combined achievements of the separate companies prior to the amalgamation. To simplify the comparison, he dealt separately with ore reserves, capital expenditure and monthly profits. With reference to the first, what is of supreme importance to shareholders of course is the total value of the recoverable gold contained in the payable reserves, and in that connection Mr. Evans gave the following instructive little table. It is based on an assumed extraction of 95 per cent. :—

PAYABLE ORE RESERVES.

Date. Dec. 31st.	Tons.	Total value of recoverable gold contents.
1907	3,490,086	5,918,313
1908	4,104,006	6,462,270
1909	3,916,593	6,087,170
1910	6,282,719	9,639,260
1911	10,124,072	14,816,326
Estimates mentioned in Mr.	6,500,000	8,527,675
Reyersbach's speech, 8/4/09	7,000,000	9,103,650

"On the basis of only 14s. profit per ton milled, and leaving altogether out of account the 1,250,000 tons of ore which require no further development," said Mr. Evans, "we have in sight a profit of over £6,000,000, as compared with a profit of between £3,867,000 and £4,165,000 foreshadowed by Mr. Reyersbach. In regard to capital expenditure, Mr. Evans was able to repeat the explanation given last year, and to explain the very fair scheme whereby it is proposed to convert the bulk of the debt to the Central Mining and Rand Mines people into debentures. Relatively, of course, the debt is not a large one, and need not cause any anxiety when it is remembered that the company has nearly fifteen million pounds' worth of recoverable gold in its ore reserves, and that it is in a position to mine at the rate of about 3,000,000 tons per annum, provided the requisite supply of labour and power is forthcoming. Turning to the question of monthly profits, Mr. Evans pointed out that the striking differences between last year and the forecasts made prior to the amalgamation are a shortage of tonnage of approximately 380,000, and higher grade and higher costs by 5s. 3·7d. and 3s. 6·4d. respectively. That is, the profits per ton last year were 1s. 9·3d. better than the estimate, so that had there been no loss in tonnage the total profit would have exceeded the anticipations. These facts suggest several questions which Mr. Evans anticipated and answered clearly and at length. These answers will be found in the report of his speech printed in this issue, and it seems to us that they dispose most effectually of all criticisms of the amalgamation. Mr. Evans's self-imposed task included replies to the following: (1) Why has the tonnage crushed been below the estimate? (2) What are the reasons for the costs last year exceeding the original forecast? (3) Is the mine not being overworked having regard to the grade called for by the payable ore reserves? (4) Would not shareholders, or at any rate some of them, have been better off had the amalgamation not taken place? In the course of his reply he dwelt on the fact that before the fusion the labour supply was efficient, cheaper than at present, and up to the requirements of the companies. There has been a severe shortage since and the quality of the labour available has deteriorated, whilst its cost has increased. " I think I can safely say," added Mr. Evans, " that the inadequacy, inefficiency and higher expenses of the labour supply in the last two years has not only caused a serious loss of tonnage, but has also led to a general increase in the working costs." Mindful of recent warnings, the Chairman's peroration was cautious but hopeful. He said: " At the end of July or the beginning of August next, we shall have practically finished the amalgamation programme. It may take two or three months to get the whole of the new organisation on to a settled and smooth running basis. When that is accomplished, and provided we are not badly disappointed regarding unskilled labour, we shall have done all that can be done to insure a substantial increase in our profits, and to create a state of stability and durability as regards future results, which has hardly even been achieved by a gold mining venture." Well might Mr. Schumacher describe Mr. Evans' speech as " masterly." With him, we may advise shareholders who still have doubts about the advantages of the Crown Mines amalgamation, or about the future of this company, to reserve their final judgment until the latter part of this year. " The stupendous task of re-equipping and reorganising the whole property," said Mr. Schumacher, " will then have been completed, and the results that will be obtained will indicate the measure of success that can be expected. In other words, you will then have the final proofs."

RAILWAYS AND THE CABINET SPLIT.

The outstanding part played by the railways in the politics of this country was strikingly illustrated by the events of the week in Parliament. Not a moment too soon Mr. Hull recognised the impossible position he, as Minister of Finance, was placed in by the extraordinary railway policy of Mr. Sauer, winked at by the Prime Minister, and he has offered himself as a sacrifice in the cause of sound public finance. Where Ministers give each other the " lie direct " in the fashion seen this week, it is not for us to attempt to adjudicate, but we may quote a passage from Mr. Hull's first speech on his resignation, which at least rings true. He said:—" These are in brief the circumstances under which I felt it incumbent on me to sever my association with the Government, and I submit that there was no other course open to me. Had I remained in the Cabinet until the end of the session, as has been suggested, the effect would have been that I should have acquiesced in the perpetuation of methods and of a policy which I regard as utterly unbusinesslike, wrong in principle, and contrary to the spirit and meaning of the South Africa Act." Mr. Hull addressed a letter to General Botha on the 24th of January, in which he recapitulated the matters of which he complained, and urged reform in the methods of the Railway Administration. His objections were that: " The members of the Cabinet, and certainly I as Minister of Finance, have not been consulted on important matters affecting the railways and their administration, and which I regard as of actual importance, and, secondly, that the provisions of the South Africa Act relating to the railways are not being observed." The further speeches made later in the week fail to remove the first bad impression of the whole business, and it is plain that the critics of Mr. Sauer's autocratic methods will henceforth have an able ally in Mr. Hull, the country being the gainer. Not that the programme of new construction printed elsewhere in this issue is very exciting. Apart from one short railway to bring the Koffyfontein diamond mine and district into touch with the outer world—a line essential to the working of the mine—the other new railways are of the usual State-aid-for-the-farmers variety, possessed of the few merits and many defects of the class. From the report of the Railway Board it will be seen that the expected loss on these lines in the first few years is substantial, and the long-suffering inland consumer is, of course, saddled with it all. We believe that the Cabinet split goes much deeper, and is fraught with far more serious consequences than is now imagined, and the country will await with interest the unfolding of the reform movement, which has won Mr. Hull to its side, in favour of sound and impartial financial policy.

THE LABOUR POSITION AND OUTLOOK.

Elsewhere we print a valuable table, compiled by the Witwatersrand Native Labour Association, setting forth the percentage of the labour complement of each and every mine of the Rand represented by the supply available at the beginning of this year. The percentages, of course, have greatly increased in the five months that have elapsed since then, and are improving. At the monthly meeting of the Chamber of Mines on Thursday, the President's speech, as usual, put the position very clearly. The monthly returns showed that the total number of natives in the service of members of the Witwatersrand Native Labour Association at the end of April (including natives working for mine contractors, but excluding natives in the employ of the Association in the districts of Barberton, Breyten, Rooiberg, and Louis Moore) was 220,086, as compared with 217,017 at the end of the preceding month, showing a net gain of 3,069. These figures compare with 213,111 natives employed at the end of April, 1911, for which month the relative gain was 1,100. There were, therefore, 6,975 more natives employed on the mines at the end of last month than was the case at the same date last year. The wastage for the month of April was fairly heavy, having been 17,871, as against 15,600 in April, 1911, but to help as against this increase is the larger number of natives employed. The President of the Chamber of Mines said that for the current month the wastage so far was also somewhat high, and there would probably be a loss, as was usual, in the total for the month of May. He mentioned that the number of natives arriving from the East Coast maintained its average, and opined that the labour position generally was likely to be easier this winter, more particularly in view of the failure of the mealie crops in many of the native districts through the drought. The President added significantly: " At the monthly meeting of the Chamber held in March I referred incidentally to other important aspects of the native labour question which were under consideration. Though many pious hopes have been expressed since then in regard to the matters I had in mind, I regret that these anticipations have so far led to no tangible result." At the Crown Mines meeting Mr. Samuel Evans, the Chairman, was able to announce that there had been " a considerable improvement in the labour supply in the past few months." He attributed the disappointing results of the amalgamation to the fact that there was an unusual fluctuation in the unskilled labour force; a large number of experienced boys left, whilst the influx of raw, untrained natives was considerable. " The net result," he added, " of these changes is a substantial increase in our labour force, from which we shall eventually benefit, but the immediate effect was a lowering of the efficiency and an augmentation of the working costs. I may say that we have at present a larger number of natives in our compounds than we have ever had, and this should soon begin to tell on the tonnage. At the end of last month we had registered on our books 14,090 natives, as compared with 12,158 at the end of 1911, 10,621 at the end of 1910, and 10,181 at the end of 1909. We have in our employ 2,249 tropical natives, and until quite recently we had been particularly fortunate in maintaining them in a healthy condition, the average death-rate of the seven months ending March 31st being 27·5 per 1,000 per annum, for a force averaging 1,616 in strength." On the whole, therefore, the labour position and outlook remain satisfactory, and those pessimists who foresee disorganisation as likely to result from the new Phthisis Bill are taking an unnecessarily black view. Until the report of the Select Committee is available, such fears are groundless.

THE GEDULD'S NEW PROGRAMME AND POLICY.

Allocation of the Increased Capital—Financial Details Elucidated— Excellent Prospects.

Our readers will remember that in August of last year the shareholders of the Geduld Proprietary Mines sanctioned an increase in the capital of the company from £750,000, all of which is issued, to £1,000,000, by the creation of 250,000 shares of £1 each, which were placed at the disposal of the board of directors. At the meeting then held the Chairman pointed out that, in the first instance, the money to be obtained by the disposal of these new shares or a portion thereof would be used for the purpose of increasing the capacity of the reduction works, which amounts at present to only about 14,000 tons per month, and that this enlargement would be taken in hand as soon as the payable ore reserves warranted the taking of this step.

We pointed out a short time ago—as was, moreover, emphasised by the Chairman of the company at the last annual meeting—that recent developments have been particularly encouraging, and on the strength thereof the company has now issued a circular to its shareholders offering for subscription 125,000 shares at par *pro rata* to their present holdings, namely, one new share for every six held. This issue has been guaranteed free of commission by Messrs. A. Goerz & Co., Ltd., who, by way of consideration for such guarantee, have been given an option over 100,000 shares at 25s. per share until the 8th June, 1914.

It is pointed out by the board in the afore-mentioned circular that the development carried out during the first four months of this year has been of a particularly encouraging nature. During that period 4,670 feet have been driven and the values disclosed are highly satisfactory. These development operations have not been confined to those portions of the mining area lying north and south of the No. 2 shaft, where previously work was principally carried on, but the new area situated to the east of the same shaft—which has been opened up by a long incline therefrom—has received special attention, with excellent results. In this last mentioned neighbourhood, of the 1,582 feet so far driven on the strike of the reef, 1,440 feet have been sampled which show an average value of 44s. over a milling width of 40 inches, while of the 618 feet of raises and winzes set off from this horizon, 525 feet sampled disclose an average value of even 45s. 9d. over the same width. The indications that the further opening up of the mine will continue to be equally favourable are distinctly encouraging, and under these circumstances the directors have decided forthwith to increase the crushing capacity of the plant to 24,000 tons per month. This will call for an expenditure of about £83,000, and during the construction period the profits earned as well as the balance of the money now to be provided by the share issue—roughly £42,000—will be used for deepening the incline shaft and to push development ahead with all possible speed. Orders for the new plant are now being placed, and it is expected that it will be in full working order in about twelve months' time.

Leaving alone that, in view of the very favourable development results now being obtained, it is considered possible that the redemption charge may be reduced within a comparatively short period, it is confidently anticipated to materially reduce the working costs when the company is crushing 24,000 tons per month. The working costs during 1911 averaged 21s. 8·5d. per ton milled, while, including a development redemption charge of 4s. 6d. per ton milled, and without taking into account any possible reduction in this latter item, there is every reason to expect that they will be decreased to 20s. per ton milled at least, provided, of course, general conditions remain unchanged, and this should soon place the company in the ranks of our dividend-paying mines.

In our next issue we will have something to say with reference to the details of the new construction.

THE GEOLOGY OF ZEERUST.

Latest Bulletin of the Geological Survey—Unimportant Economic Resources.

An account of the country lying northwards from Zeerust has been written by Dr. W. A. Humphrey, to accompany Sheet No. 9 of the Geological Map of the Transvaal, both of which have been issued as a special bulletin by the Mines Department. The mapping of the area was carried out during the field-seasons of 1908-10, mostly by Dr. Humphrey; while Mr. A. L. Hall mapped a small area in the south-eastern portion of the sheet, situated in the upper portion of the valley of the Marico River. Detailed reports on the geology of the different portions of the sheet, as they were mapped, appeared in the annual reports of the Geological Survey for 1908-9. The present sheet is the third of the new series, plotted according to the meridians and parallels, which was commenced with the Potgietersrust Sheet, No. 7. It embraces an area of, approximately, 1,646 square miles, situated mainly in the central portion of the Marico District, with the Bechuanaland Protectorate on its western border, and including also a small strip of the Rustenburg District along its eastern margin, east of the Marico River. Geologically, this area embraces a portion of the western edge of the great bushveld basin of the Central Transvaal, and the chief points brought out by the mapping illustrate in a very instructive manner the shallow character of this portion of the basin as compared with its development further east. Thus, the Igneous Complex of the Bushveld is here represented entirely by basic rocks, the red granite being absent, while the breaking up of portions of the Pretoria series during the intrusion of these is indicated by the numerous detached masses of quartzites and altered shales, surrounded by diabase, norite, and pyroxenite. The economic resources of the area described are comparatively few, but tin has been prospected for, and, according to various reports, found there. Malachite is found on Allewyn's Poort, and on Roodekoppiesput magnesite of good quality outcrops largely.

National Diamonds.

At a meeting of shareholders of the National Diamond Prospecting and Developing Syndicate, Ltd., the acceptance of an offer of Mr. J. F. Back, was confirmed for the reconstruction of the syndicate by reducing the nominal capital from £20,000 to £7,500, and by then increasing the nominal capital to £30,000. This capital of £30,000 is to be apportioned as follows:—To shareholders of the National Diamond Prospecting and Developing Syndicate, Ltd. in shares), £7,500; to Mr. J. F. Back, of Johannesburg, for reconstructing and financing the syndicate and for procuring a new option contract for 2½ years (in shares), £10,500; for working capital (in shares), £3,500; to reserve capital (in shares), £8,500. On reduction of the capital to £7,500, the denomination of the shares in the syndicate will be reduced from £1 to ten shillings, and the shares now existing of the denomination of £1, will be called up and cancelled, and new shares of ten shillings issued in the proportion by one new share of ten shillings, value in substitution for each share of £1 called up. The directors were given all necessary power to give effect to these decisions.

THE BENONI PROBLEM.

The Clean-up Still in Progress—Has "Plant Absorption" Been Adequately Allowed For? —A Very Material Factor.

The adjournment of the Benoni meeting from the 23rd inst. to the 20th June next has deferred the discussion of a matter which promises to be of considerable interest. In a cable sent the other day to the London offices of the company it was stated that the final clean-up of the works was not completed, and that the balance of the gold recovered would be declared during May. On enquiry at the local office during the week for information with regard to this announcement, we learnt that the clean-up was still in progress, and that details would probably not be available till towards the end of the month.

The whole results of the operations of the six months preceding the closing down of the mill on the 3rd inst. have now been published, and, although it is impossible to say how much gold has been absorbed in the process of conditioning the plant, it may be instructive to review the figures relating to the actual gold recovery.

In a report which was published in this journal on the 27th April last, it was stated that: "Since crushing operations started in November last, 76,569 tons of sorted ore have been milled, the screen value of same averaging 6·37 dwts. or 26s. 9d. per ton, making a total gold contents of £103,590, equal to a recovery, with, say, a 93 per cent. extraction, of £96,338. Stoping operations have, therefore, closely borne out the estimated value placed on the payable ore reserves, which at the end of 1911 amounted to 606,839 tons, having a milling value of 6·56 dwts.; and as far as the mining operations are concerned the results up to date must be regarded as entirely satisfactory. The mill recovered 12,579 ounces, worth £54,197, or 52 per cent. of the total gold contents, to which must be added the gold absorbed by the plates. The total pulp leaving the battery, amounting to 76,000 tons, averaged 2·3 dwts. per ton, the gold contents of same being therefore 8,740 ounces. Of this amount only 2,487 ounces have been recovered from the cyanide works, equivalent to £10,564, or approximately 10 per cent. of the screen value of the ore. The result scarcely covers the cost of treatment. Under ordinary conditions, allowing for an extraction of 93 per cent. and a total absorption of gold in mill and cyanide works of, say, 2,500 ounces, or, say £10,000, the total gold recovered would have been worth £86,338 as against £64,761 actually won, thereby showing a deficit over the period of operations of £21,577. It must, however, be borne in mind that about 38,000 tons of slimes remain untreated, and have a value of 1·4 dwts. The greater portion of this will eventually be treated."

The Absorption Allowance.

The interesting feature of this statement is the allowance of 2,500 ounces for temporary loss by absorption, or conditioning of the recovery plant, for on the basis of this assumption it was concluded that the cyanide plant was not doing the work that was required of it. In the same report it was remarked, in connection with the March returns: "The clean-up of the cyanide plant, however, which has been operating only on the sands (the slimes being run to dam) was extremely disappointing, the total recovery amounting to only 656 ounces, the pulp from the mill assaying 2·64 dwts." A few days later a cable was sent to London announcing, *inter alia*, that: "It has been found impossible to work profitably with the existing cyanide plant, which will require to be remodelled; and as under these conditions it is inadvisable to deplete the ore reserves, the board have decided to temporarily suspend operations."

An Improvement in April.

The results for April were 17,600 tons milled; gold recovered from mill, 3,474 ounces; cyanide, 898 ounces; total, 4,372 ounces; recovery per ton milled, 4·968 dwts.; working costs, £17,542; revenue, £18,318; profit, £776. There was, therefore, a distinct improvement generally over March, during which month a working loss was incurred of £244 4s. 11d. The fact that the board definitely decided upon the closing down of the works in spite of this improvement makes it clear that the dissatisfaction caused by the cyanide plant was such as to admit of no alternative.

The argument brought forward in support of this adverse opinion regarding the cyanide plant was that, after allowing for absorption, the gold recovered from the cyanide plant scarcely covered the cost of treatment. The point that remains to be considered, however, in view of the apparently improved conditions in the cyanide works during April, is whether sufficient allowance was made for loss by absorption. For this reason the figures relating to the clean-up which is reported to be now in progress will prove extremely interesting. If the gold called for by the discrepancy between the amount actually recovered and that shown to have been put into the mill, less the quantity estimated to remain in the slimes and sand residues be produced from the plates and extractor boxes, the decision will, of course, have been premature and unwise.

Plant Absorption.

At the same time, when the report above quoted was made, the mill had been running for a period of about five months only, and it may be doubted whether a plant can be safely judged by its preliminary recovery over so comparatively short a run. In a paper read by Mr. E. H. Johnson before the S.A. Association for the Advancement of Science in 1904, on the subject of "Reduction Works Checks," the author said, *inter alia:* "There is one other matter which I should wish to allude to, which has some bearing on reduction works checks, and which is not generally very perfectly understood—even locally. That is, what is usually termed 'plant absorption.' This will always affect results over three or four months after starting a new plant, and subsequently, also, in proportion, if more stamps are run." It has been known, as a matter of fact, to affect returns for a very great deal longer than three or four months in some instances, and although improbable, as we have said, it is not impossible that the Benoni plant has been prematurely condemned.

The Reuter South African Press Agency correspondent at Windhuk, writing on May 7, forwards the following intelligence: — The SudwestAfrikanische Minensyndicat has applied to have "Schurffelder" (prospecting fields) converted into "Bergbaufelder" (mining fields). This is stated to be due to the discovery of tin. A Johannesburg firm has taken over the twelve tinfields of E. Zingel and eight of Lubky of Karibib. Prior to the taking over of the fields they were investigated by Dr. Jorissen.

Rooiberg Minerals.

With reference to the options over 30,000 shares of the Rooiberg Minerals Development Company, Ltd., granted to certain guarantors at the price of 35s. per share up to May 31, 1912, the directors of the company notify that the fourteen days' prior notice, which was required in the event of any of the guarantors desiring to exercise their option, has not been given, and that consequently these options cannot now be exercised.

THE KNIGHT CENTRAL POSITION.

The Necessity for Ample Ore Reserves—A Two Years' Margin Last December—Much Improved Development Results Latterly.

While, on the one hand, the adjournment of the annual meeting of the Knight Central, Ltd., by a couple of months from March 22nd has given the shareholders ample time in which to derive what sorry comfort there may have been in the reports of the consulting engineer and mine manager, it has enabled the chairman to accumulate sufficient evidence to prove that things are far from being as bad as they looked at the end of 1911, or even somewhat later. It is scarcely to be denied that Mr. S. C. Thomson, the consulting engineer, had a difficult task before him when he endeavoured, as he obviously did, to look at matters from a sanguine point of view. "Although the tonnage milled during the past year was 13,000 tons more than the previous year, this increase is not reflected in increased profit, even with the slight improvement in the yield per ton from 22s. 9·4d. to 23s. 3d." After quoting the ever-present labour difficulty as an explanation of this, he added: "As far as the mine itself is concerned, the development has suffered through similar conditions; but at the same time I cannot see that there has been any falling-off in the percentage of payable ore or in the average value of the payable percentage. The area of your holding is a large one, and, given sufficient labour at reasonable cost, I see no reason why the position should not improve, even assuming that there would be no alteration for the better in the average grade of the ore." With the aid of these stimulative and encouraging remarks, the average hopeful shareholder would doubtless have been able to reassure himself were it not that the manager mentioned a little further on that "approximately 39,700 tons, which were included as payable in the ore reserves at the end of 1910, have been excluded from the estimates, because the additional information now available indicates too low a value to warrant inclusion."

Reserves at 31st December, 1911.

The payable ore developed was classed as follows:—

	Tons.	Value. Dwts.	Stoping Width. Inches.
	83,630	4·17	57·88
	136,500	4·78	57·36
	101,870	5·48	61·51
	205,500	6·65	64·14
	56,770	7·51	70·94
	60,030	9·04	52·01
Total & averages	644,300	6·04	60·56

As working costs for the year averaged 18s. 9d., or say 4·5 dwts., it is obvious that about a third of the ore reserves above shown are only on the margin of payability. The total quantity estimated is a decrease of 56,700 tons on the reserves of the previous year, part of the decrease being due to the exclusion of the 39,700 tons already referred to. With regard to this aspect of the company's affairs, Mr. W. H. Dawe, the chairman, addressing the shareholders at the annual meeting yesterday week, said: "It is undoubtedly disappointing that the large amount of work done did not result in a considerable increase in the ore reserves; and it was that consideration which led your directors to the conclusion that it was in the best interests of your company that no dividend should be declared in December last. At the last annual meeting I dealt with this question very fully, and gave the reasons why a dividend of 5 per cent. was declared in 1910, explaining that the declaration of a dividend in 1911 would depend entirely on the results of development. These results, as you are aware, were disappointing, and I adopted the best course possible in deciding to strengthen the cash resources of the company." Ample development then and good values are the primary requirements of the Knight Central. The quantity of ore milled last year was 315,171 tons, so that the payable ore reserves listed at the 31st December last amounted to just about a two years' supply. For the first three months of this year, moreover, profits showed a very considerable decrease.

Improved Development Values.

The grade has latterly improved, however, and developments have shown so much better results that the chairman has had reason to be thankful for the various circumstances that have led to the postponement of the annual meeting, for, as he remarked, "the latest information is of a distinctly more hopeful character than that which we have had for some time previously." Briefly recently operations have shown these results:—

West Shaft.

	Distance. Feet.	Value. Dwt.	Stoping Width. Inches.
M.R. 1st level west	235	15·5	51
of which last	25	12·5	73
S.R. results varying from ...	—	11 to 16. average.	
S.R. Leader 9th level east...	130	11·4	36
S.R. 11th level west	60	12·8	68
S.R. 12th level west	515	5·5	65

The last figures include 75 feet of unpayable reef, and are, therefore, sufficiently satisfactory. The results quoted refer to the western section of the mine. In the eastern section the 13th and 14th levels were very poor, but the 15th level, which is the lowest in the eastern part of the property, is giving encouraging values—the last 40 feet driven east and west averaging about 7 dwts., while the total of 310 feet driven in both directions gives an average of 8·5 dwts. over 50 inches. In commenting on these figures, Mr. Dawe said: "It would not be wise to assume from these values that the outlook has entirely changed, but one must admit that they are distinctly hopeful indications, especially as they occur at different points of the mine. A continuance of these values would mean that the ore reserves would be rapidly increase," and in conclusion he added: "I sincerely hope that the information which I have given you is the beginning of a more prosperous time." The hope will be shared by many others, and more confidently than for some time past.

West Rand Unified.

At a meeting of the West Rand Unified, which was held during the week, the resolutions of a previous meeting, at which it was decided to reconstruct the company and unify its various interests, were confirmed. Registration has been effected, and the shares of the new company will be exchanged for the old scrip in due course.

Pietersburg Copper.

Notice has been given to Christiaan Arnoldus Carolus Roets, Pietersburg, Transvaal, as required by law, entitling him to peg on or before the 18th June, 1912, on the farm Goedgenoeg No. 1744, district Zoutpansberg, Transvaal Province, 27 claims as an award in respect of a discovery of copper made by him on the said farm.

PROGRESS OF SAND AND SLIME AGITATION.

Efforts Made for Combined Treatment—Trials at the Wolhuter Mine—The Paterson and Hendryx Agitators.

The process of agitating slime in solution, either by compressed air or by the continuous circulation of the pulp through a centrifugal pump attached to the vat in which the agitation is effected, is being so successfully carried out in every part of the world that it is not surprising to find engineers and metallurgists endeavouring to handle the whole mill pulp, comprising sand and slime together, in the same simple and convenient manner. The best known attempt to combine the treatment of sand and slime in agitation tanks on the Rand is, of course, that known as the Way-Arbuckle process at Benoni, in which the Arbuckle dewatering cone and screw slime elevator was joined with the Way system of air-lift vats. It was proposed to treat the whole sand and slime product, after dewatering on Caldecott tables and through Arbuckle cones respectively, continuously from one vat to another. The reported failure of both portions of the plant put an end to a trial from which much was anticipated, and which would have been of absorbing interest to metallurgists. Only a few months ago the Paterson vat was tried at the Wolhuter upon sand and slime, the circulation of the pulp being effected by a centrifugal pump which drew off practically clear solution only from a calm zone in the vat and pumped it back through a pipe at the centre of the vat in the usual way. The agitation was said to be as thorough as could be desired, and the extraction results were reported to be equally gratifying. Upon the completion of the test, Mr. Paterson, the inventor, returned to Europe and the United States with the object of furthering the introduction of his process upon the Rand.

More recently the Hendryx agitator, which came here with a good record from the United States and Mexico, was erected and experimented with at the same property. The result of the trials justified the Mines Trials Committee in looking into the merits of the plant, and a fairly exhaustive test was subsequently made under their control and direction. The figures relating to this investigation are not yet available, but we understand, on good authority, that the performance of the agitator on combined sand and slime pulp has been sufficiently satisfactory to warrant another extensive experimental run under conditions which will be approximately chose of ordinary practical work.

The Agitator Described.

The agitator consists of a cylindrical tank having a conical bottom. In the centre of the tank is a circular well which extends nearly from the top to the bottom, and is rigidly supported by bracing from the side of the tank. A circular apron is fitted to the top which slopes gradually toward the circumference and permits the pulp in flowing over it to be spread out into a thin sheet, and absorb an abundance of free oxygen trom the air. The apron also serves to distribute the pulp towards the periphery, in an even flow, without generating undue foaming. In the well is a shaft carrying a driving pulley near the top and a number of screw propellers or lifting wings. The discharge valve is opened or closed by a hand wheel connected to a screw. A coil of pipe serves to regulate the temperature of the charge by means of steam or hot water passing through it. The revolutions of the propeller in the well produce a strong upward current resulting in a rapid and uniform circulation of the pulp upward to the aerating and distributing apron, where it spreads out into a thin sheet, with maximum surface exposure, for aerating and saturating the charge with oxygen. An important advantage claimed for the Hendryx Agitator is the short time of treatment. Tests on various ores show that, at any given mesh, as much or more of the gold and silver can be dissolved in one hour by the use of the Hendryx Agitator as can be dissolved in twenty-four hours by the usual methods of percolation; completing the dissolving of the soluble metals 2 to 5 times quicker than either air or centrifugal pump agitators. This necessarily decreases the cost of installation due to the decreased amount of ore storage required. The figures under this head for the Wolhuter trials should be of considerable interest. In the treatment of ores containing sulphides it is found in percolation that part of the consumption of cyanide is proportionate to the time of treatment, due to the partial decomposition of the sulphides, so that ore subjected to several days' leaching often decomposes to such an extent that the gold and silver is precipitated back into the charge, while the consumption of chemicals makes a profit prohibitory. With a short time of treatment, usually six hours for gold ores and twelve for silver ores and weak solutions, combined with rapid and thorough agitation, aeration and heat, the consumption of the chemicals is reduced to a minimum, while the extraction is brought up to the highest possible point. In the 21ft. 6in. machine a charge of 100 tons of ore and 200 tons solution are turned over with a thirty inch pump every six minutes. In other words, 7,500 cubic feet of ore and solution are pumped to an elevation of eighteen inches every six minutes and spread over the distributing and aerating apron. Special attention is called by the inventor to the small height of the Hendryx Agitator and the constructional economies resulting therefrom. The power required to operate a machine holding a charge of 300 tons of ore and solution containing two of solution to one of ore is fourteen horse-power. The reason for the small consumption of horse-power is due to the fact that there is only an eighteen inch lift. The pump casing is filled to the same level as the charge in the tank by hydrostatic pressure. The simple compact construction, and the fact that none of the bearings are exposed to the moving pulp, are said to make the cost of repairs exceedingly light.

Selective Action in Vats.

So far the Agitator has only been tried here as a single unit. In working practice it would doubtless be run continuously in series, with as many units as might suffice to give the length of treatment required. It would be interesting to know how this method would succeed with a pulp of sand and slime combined. In the single vat it has been observed that the heavier and coarser particles of the pulp are drawn more readily into the ascending stream at the base of the central pipe than the slower falling slime. This is a circumstance which would naturally characterise the treatment of sand and slime in any type of agitating vat, and as long as the process was carried out in separate units it cannot be said that there is anything to be objected to, because the sand which would demand the greater amount of agitation, would actually receive it. Whether this selective action of a moving current would be equally beneficial in the case of a series of vats in which the sand would probably be hurried through the series, while the slime, which required a shorter and less vigorous treatment, was being left behind, is a point that is open to argument.

Apex and Benoni.

POSTPONEMENT OF MEETINGS.

In view of the negotiations which are still proceeding for the amalgamation of the Apex Mines, Ltd., and the Benoni Consolidated Gold Mines, Ltd., a resolution was moved at the annual meetings of these companies, held on May 22 and 23 respectively, postponing the meetings for the period of one month, viz., to June 19 and 20, 1912, respectively.

THE LATE SIR JULIUS WERNHER, BART.

A Loss to South Africa—Tributes from all Quarters—A Link with the Past.

THE news of the death of Sir Julius Wernher, Bart., was received on the Rand with general regret this week. Though his end was not unexpected, the news of his passing caused a feeling of almost personal loss. Born in 1850, at Darmstadt, Germany, the late Sir Julius Wernher, Bart., was thus in his sixty-third year. He had barely attained his majority when he left the Fatherland and voyaged to South Africa in 1871, landing at Cape Town after a voyage of 35 days, and coming to the Diamond Fields when the great diamond industry as it is known to-day was only in its infancy. Prior to the arrival of Sir Julius (then Mr.) Wernher in Kimberley, the firm of Mr. Jules Porges had been represented on the fields by Mr. Mege, but on the latter's retirement and return to the old country, Mr. Wernher was appointed in his stead. He established a large connection as a diamond buyer, and showed exceptional business capacity, and a few years later he admitted the late Mr. Alfred Beit as junior partner in the firm, which then became known as Wernher, Beit and Co., Mr. Porges retiring from the business. Mr. Wernher received honour at the hands of King Edward in 1905, when he was created a baronet. His princely munificence was well known: no deserving object or institution appealed to him in vain. His bountiful donations and practical sympathy helped all needy objects. Added to his unbounded generosity was his charming personality, absolute freedom from affectation, and a genial demeanour to all, almost amounting to simplicity, which won for him a large circle of friends and hosts of admirers. The successful accumulation of wealth in no way detracted from his personal charm and even temperament, and it was the boast of those who made his acquaintanceship in the early days that they retained his friendship through life. He was also chairman of the Central Mining Co., and was connected with many other South African mining concerns. He was a director of Rand Mines, Ltd., and Johannesburg, no less than Kimberley, owes much to his pioneer efforts and financial ability.

THE LATE SIR JULIUS WERNHER, BART., WHO DIED THIS WEEK.

SOME TRIBUTES.

Tributes from many quarters were paid to the memory of the dead this week. At the monthly meeting of the Chamber of Mines the Vice-President said: "Before proceeding with the business of this meeting, I wish to refer briefly to the irreparable loss the industry has sustained in the death of Sir Julius Wernher, who passed away in London on Tuesday evening. The deceased gentleman, as you all know, was one of the pioneers of the gold mining industry in South Africa, and, as the head of the great financial house of Wernher, Beit and Company, had large interests in practically every branch of mining in the Sub-Continent, and was the means of providing an enormous amount of capital for the development of the mining industry in South Africa. Apart from the large part he has played in the mining world, Sir Julius will be long remembered in South Africa for his munificent contributions to public bodies and to education. I would ask you, gentlemen, to stand up and join me in a sincere vote of sympathy and condolence with Lady Wernher, her family, and the partners of the late Sir Julius Wernher." Those present rose, and the vote was passed. At the meeting of the National Bank of Pretoria, on the same day, the Chairman expressed the regret all felt at the death of Sir Julius Wernher, which, he said, would cause a loss that could not be replaced in South Africa. The meeting passed a resolution of condolence with the widow and family of Sir Julius. At the Crown Mines meeting, when the meeting was constituted, the Chairman, Mr. Samuel Evans, said:

Before proceeding with the business for which we have met, I am sure shareholders will desire me to refer to the great loss which this company and the mining industry of South Africa has suffered through the death of Sir Julius Wernher. Most of us who were privileged to be associated with him in business will never forget his kindly tolerance, his sound judgment, his insight and his integrity. He was in every sense a big and broad-minded man. I speak with more knowledge than most people. In 1901 and 1902 I was for nearly a year in the London office of Messrs. Wernher, Beit and Company, and I had occasion to read through the books and files which contained letters and copies of the letters that were exchanged between the two heads of the firm and others in the early days of Barberton and the Rand. These communications disclosed a record of straightforward, honourable dealings which Sir Julius and Mr. Alfred Beit and those who were associated with them had every reason to be proud of. If the history of the beginnings of the Witwatersrand were written with a full knowledge of the pioneers and their doings, it would show that the commanding position which Messrs. Wernher, Beit and Company secured here was due chiefly to the fact that the two partners were superior to most of their competitors in judgment and faith. They believed in the Rand when others were doubting, and they were rewarded. Among the records were some striking letters written, I believe, when Sir Julius was in Kimberley and Mr. Beit in Barberton. I do not remember the exact date, but it was pretty soon after the first rush to these fields, and at the same time when experts had began to seriously question the value and permanency of the banket deposits. These letters, however, show that the two partners had then made up their minds that the Central Rand was going to be the greatest gold-bearing area in the world. They acted on that view and combined caution with boldness in a manner which only those who possess rare mental endowments are capable of. I should say that their caution was always tinged with optimism as far as South Africa was concerned. I need not on this occasion refer to the invaluable services which Sir Julius rendered to South Africa, and particularly to Rhodesia. There is, however, just one other characteristic of Sir Julius and his partner I should like to mention. They were invariably fair and generous to their employes, their associates and the shareholders who trusted them, and as a result they deserved and commanded exceptional loyalty, devotion and support. It will, I know, be in accordance with your feelings that we should to-day place on record an expression of our sincere sympathy and condolence with Lady Wernher and the family in their great bereavement. I understand that Mr. Mosenthal, who was a lifelong friend of Sir Julius, desires to say a few words on this subject, and I have pleasure in calling on him.

RESOLUTION OF CONDOLENCE.

Mr. Mosenthal said: Our Chairman has referred to my lifelong friendship with Sir Julius Wernher, which dates back to the year 1864. I am speaking under the influence of strong emotion and this is not the occasion for oratory. I have been accorded the sad privilege of moving the following resolution, which I am sure will be adopted and go forth unanimously: That this meeting of shareholders in the Crown Mines, Limited, deplores the great loss sustained by the South African mining industry in the death of Sir Julius Wernher, and offers to Lady Wernher and her family an expression of deep sympathy and condolence in their affliction. I need not enlarge on Sir Julius Wernher's achievements in the sphere of mining and finance, as eloquent reference has been, and will be, made thereto. As to his personality, I am sure you are all with me when I say that all who knew Sir Julius Wernher loved and respected him. His qualities of heart, his honourableness and simplicity of character were so great and apparent that not only his family and friends, but also numbers to whom he was personally unknown mourn his loss. His work and life remain as a permanent monument of a great career, and many tributes will be paid and many monuments will be erected to the memory of one whose death is a loss not only to South Africa, but to the world: but the tribute he would value most is the knowledge that his memory is sacredly enshrined in the hearts of his family and friends. The only consolation I can find is that his cruel sufferings, heroically borne, are at an end. May he rest in peace.

MR. SCHUMACHER'S TRIBUTE.

Mr. Schumacher: I should like, as one of the partners in Sir Julius Wernher's late firm, to express thanks to the meeting for the resolution which has been carried. A great friend to this industry and to this country has passed away a big landmark has been removed, the big man who rarely came forward, who seldom spoke, whose guiding influence was always paramount, has left a void which it will be hard to fill. Your expression of sympathy will be conveyed to Lady Wernher and her family, and I can assure you it will be most deeply appreciated.

The Chairman: I take it that you will stand as a sign of the unanimous acceptance of this resolution.

Those present rose, and the Chairman declared the resolution carried.

Crown Mines, Ltd.

Net profit for the quarter, £335,981. During the quarter the expenditure on capital account amounted to £74,027 1s. 4d., whilst a further sum of £36,015 7s. 11d. was expended on advance development, i.e., development in excess of the tonnage mined for the quarter. The native labour force at the end of the quarter was 13,771, as compared with 12,158 at the end of December.

Bantjes Consolidated Mines.

Development operations have been continued on the normal scale, and the disclosures of reef values on South Reef continue promising, whilst payable leader has been disclosed in some driving on the 3rd level. Cross-cutting to prove the payability of the latter reef in the same area is being carried out on several levels. The leader exposed on the 10th and 11th levels at the central shaft, referred to in the annual report, failed to maintain values and driving has, therefore, been discontinued at these points. Considerable repairs have been effected to the surface plant, which is now in good running order. The reduction plant is doing good work, the residues from the Butters' slimes filter plant still being very low. The working profits declared show an increase of about £900 for the quarter. The costs were above normal, and were affected by the expenditure on the surface plant referred to above, and by the cost of installing small machines due to the unexpectedly short supply of labour during February and March. A reduction in the costs is expected as soon as it is possible to keep the plant fully at work, which is dependent entirely on the labour position. The capital expenditure for the quarter was £1,702, whilst there is still £3,831 yet to be expended, and in addition there is contemplated some additional expenditure for a "turbo air compressor," estimates for which are now being prepared, and for a laboratory for the Medical Officer at a cost of £200.

City Deep.

Expenditure on capital account was chiefly in connection with the installation of a duplicate pumping set at No. I shaft, manager's house, sanitation and general equipment of the property. It is estimated that exclusive of contemplated expenditure underground a sum of approximately £20,000 will still be required, the greater proportion of which is for the installation throughout the property of a water-borne system of sewerage. The general working efficiency of underground employes is gradually improving with the result that a greater proportion of ore from the mine will be milled. The footage of development accomplished during the quarter, compared with that for the previous quarter, shows a considerable increase.

Village Deep.

Proportionately small footage of the reef disclosures is due to the continuance of the policy of driving in the footwall of the reefs. A large proportion of the footage on reef consisted of box-holing, enabling a valuation to be made of a relatively large tonnage. The values disclosed by the quarter's development compare favourably with those of the previous year. The capital expenditure for the quarter amounted to £11,278. There still remains an approximate expenditure of £36,000, practically all of which is in connection with hauling arrangements necessitated by the greater depth of the workings in the Village Deep section, and for the equipment of No. 3 shaft. The whole of this amount, however, may not have to be spent during the present financial year. Development has been restricted to the amount of work necessary to maintain the ore reserves and carry out shaft sinking operations in the Turf section of the property. The cost of this work is to be met out of the current year's working costs, and no expenditure on development is being charged to capital account. Up to the end of February 2s. 6d. per ton milled was charged for development redemption. It has been found that a charge of 3s. per ton milled is necessary to cover the cost of the above work. This amount has accordingly been charged from March onwards.

TRANSVAAL MINES AND THEIR NATIVE LABOUR COMPLEMENTS

Percentage Employed at December 31—Some Striking Figures.

Through the courtesy of the Witwatersrand Native Labour Association, we are enabled to print the following table of natives employed at 31st December, 1911, showing percentage of complement for each mine and group:—

Group and Company.	Complement.	Percentage of Complement employed at Dec. 31, 1911.
Consolidated Gold Fields—		
Jupiter	5,715	33·77
Knights Deep	3,765	72·58
Luipaardsvlei Estate	2,020	59·75
Robinson Deep	6,269	49·83
Simmer Deep	6,611	45·15
Simmer and Jack East	3,636	47·02
Simmer and Jack Proprietary ...	4,308	69·19
Sub-Nigel	791	59·51
	33,115	51·77
Consolidated Investment Co.—		
Consolidated Langlaagte ...	4,016	83·44
Ginsberg	1,523	72·75
Gleneairn Main Reef	1,769	63·25
Government Gold Mining Areas	1,280	89·76
New Primrose	2,283	66·97
New Rietfontein Estate	4,076	47·64
New Unified	1,525	59·14
Randfontein Deep	400	82·75
Van Ryn Deep	1,076	57·71
Witwatersrand Co.	3,185	63·83
	21,133	66·65
Eckstein and Co.—		
Bantjes Consolidated	6,095	44·87
City Deep	5,664	53·03
Ferreira Co.	2,489	61·83
French Rand	5	80·00
Modderfontein "B"	3,556	57·17
New Modderfontein	5,819	62·38
Robinson Co.	3,704	86·12
Village Main Reef	3,676	70·97
Village Deep	6,015	58·80
	37,023	60·18
Farrar—Anglo-French—		
East Rand Proprietary Mines ...	18,595	78·22
Afrikander Proprietary Mines ...	5	140·00
Apex Mines (Gold Section) ..	867	70·01
Benoni Consolidated	1,867	73·64
New Boksburg	5	—
New Kleinfontein	4,531	77·98
Rand Klip	413	53·51
	26,283	77·19
General Mining and Finance Corporation—		
Aurora West	1,783	60·68
Cinderella Consolidated	3,321	66·54
Meyer and Charlton	1,152	84·63
New Goch	3,008	82·14
Rand Collieries	851	36·42
Roodepoort United Main Reef	5.744	45·83
Van Ryn Gold Mines Estate ...	2 536	100·86
West Rand Consolidated ...	3,681	69·43
	22,076	67·01
Goerz and Co.—		
Geduld Proprietary Mines ...	2,144	58·53
Lancaster West	2,837	66·90
May Consolidated	1,396	73·12
Modderfontein Deep Levels ...	413	84·74
Princess Estate	3,068	61·37
South Randfontein Deep ...	427	53·39
Tudor	5	40·00
Van Dyk Proprietary	5	140·00
	10,295	64·54
Neumann and Co.—		
Cloverfield Mines	5	—
Consolidated Main Reef ...	3,113	63·50
Knight Central	3,125	71·84
Main Reef West	2,887	51·19
Treasury	5	—
Vogelstruis Consolidated Deep	5	—
Witwatersrand Deep	5,161	70·41
Wolhuter Co.	2,700	83·55
	17,001	68·17
Rand Mines—		
Crown Mines	20,000	60·24
Durban-Roodepoort Deep ...	3,657	71·72
Ferreira Deep	2,744	70·84
Geldenhuis Deep:		
East Section	8,551	69·05
West Section		
North Section		
Nourse Mines	7,077	64·94
Rose Deep	6,515	68·70
Rose Deep (Glen Compound) ...		
	18,544	65·09
J. B. Robinson—		
Langlaagte Estate	4,759	99·91
Randfontein Central:		
Northern Division:	32,099	72·18
Block "A"		
West Compound		
Ferguson		
Southern Division—		
Porges		
South		
North		
Robinson		
Stubbs		
	36,858	75·95
Premier (Transvaal) Diamond Mine	16,000	55·71
Sundry Members—		
Brakpan Mines	6,771	37·36
Champ d'Or	1,120	45·53
City and Suburban	2,735	87·56
Durban-Roodepoort Co.	1,292	80·88
East Rand Extension	5	60·00
East Rand Gold, Coal and Estate (see Collieries) ...	5	—
Grootvlei Proprietary Mines ...	5	60·00
Jumpers Co.	1,800	109·22
New Heriot	1,777	64·54
New West Bonanza	383	4·43
Springs Mines	867	74·85
Vogelstruis Estates	2,120	57·12
Warren Hill Syndicate	853	45·72
Welgedacht Exploration (Gold)	5	—
	19,738	60·11

Group and Company.	Complement.	Percentage of Complement employed at Dec. 31, 1911.
*COLLIERIES—		
Springs—		
Apex		88·65
Clydesdale		79·27
De Rietfontein		81·02
East Rand Gold, Coal and Estate		91·60
Great Eastern		100·00
Welgedacht Exploration ...		120·00
Middelburg—		
Anglo-French Navigation ...		91·24
Coronation		118·36
Douglas		79·72
Landau		86·32
Middelburg Steam Coal and Coke		86·20
Oogies		84·15
Premier Coal		91·66
Rogerston		93·61
Transvaal and Delagoa Bay ...		86·50
Tweefontein		86·50
Witbank		98·13
Heidelberg—		
South Rand Exploration .		100·00
	8,839	91·11
SUMMARY		
GROUPS—		
Consolidated Gold Fields ...	33,115	51·77
Consolidated Investment Co. ...	21,133	66·65
Eckstein and Co.	37,023	60·18
Farrar—Anglo-French	26,283	77·19
General Mining and Finance Corporation	22,076	67·01
Goerz and Co.	10,295	64·51
Neumann and Co.	17,001	68·17
Rand Mines	18,514	65·09
J. B. Robinson	36,858	75·95
	252,328	65·95
PREMIER (TRANSVAAL) DIAMOND MINE	16,000	55·71
SUNDRY MEMBERS	19,738	60·11
	288,066	64·98
COLLIERIES	8,839	91·11
Total	296,905	65·76

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* The complement of Collieries is based upon the monthly output of coal, and therefore varies from month to month. The figure shown is calculated upon the 31st December, 1911, output.

Durban Roodepoort Deep.

Development for the quarter has been of a satisfactory nature, the footage and reef disclosures being given above. The reduction plant, now completely electrified, has run smoothly and given every satisfaction. Capital expenditure for the quarter amounted to £349 14s. 3d., and the only further expenditure contemplated in the near future in this connection is the installation of a central pumping scheme, consisting of two Sulzer high lift centrifugal pumps and motors, at an estimated cost of £20,000, and several minor additions costing approximately £800. It is estimated that the pumping plant when installed will effect a monthly saving of about £800. The working costs for the quarter are high, owing partly to the inclusion of certain items of an abnormal nature, and it is expected that next quarter will show a reduction in this direction. The profits for the quarter were lower by £4,500 on account of lower tonnages crushed in January and February, due to native labour shortage and to the consequent higher working costs.

MINING MEN AND MATTERS.

Sir George Albu, Bart., has resumed his seat on the executive of the Chamber of Mines, in place of Mr. George Nathan, resigned.

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Last week Mr. and Mrs. Chas. Hunter, of Piggs Peak, and formerly of the New Lisbon-Berlyn, visited Sabie, when the employees of the New Lisbon-Berlyn Company took the opportunity of making them a presentation as a mark of appreciation, testifying to the esteem in which Mr. and Mrs. Hunter were held in Frankfort, and to their popularity with the employees of the New Lisbon-Berlyn, Ltd.

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The ordinary general meeting of the Institute of Electrical Engineers was held in the lecture theatre, South African School of Mines Building, Eloff Street, on Thursday evening. The following business was before the meeting: A reply to discussion on "Radiotelegraphy in modern practice," by Mr. W. E. Dixon Bennett. A discussion was opened by Mr. C. W. R. Campbell on "The design and installation of transformers from an operating point of view." A number of members contributed to this discussion, which covered, among other items, the iron circuit, the coil, end connections, terminals, voltage, ratios, the containing case, and installation in chamber, ventilation of chamber, arrangement of leads, etc., etc. A meeting of students' section will be held in the secretary's office on Wednesday, the 29th inst., at 8 p.m., when discussion will be taken on the paper read in April by Mr. P. F. Burnett on "Electric traction." Those interested are cordially invited to be present.

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Mr. George Nathan having resigned his seat on the Executive Committee of the Chamber of Mines, the vacancy was, in terms of Article 1 of the Chamber's Constitution, filled at the ordinary general meeting on May 23 by the appointment of Sir George Albu. The following changes in representation have taken place: The Jupiter G.M. Co., Ltd., Mr. F. D. P. Chaplin, *vice* Mr. J. M. L. Henry; East Rand Proprietary Mines, Ltd., Mr. G. C. Fitzpatrick, *vice* Comte F. de Ferrieres, Mr. J. Jourdan, *vice* Mr. G. W. Higgins, Mr. H. Ross Skinner (as the fourth representative of the company); Glynn's Lydenburg, Ltd., Mr. W. R. Slack, *vice* Mr. E. W. Smith; Geduld Proprietary Mines, Ltd., Mr. Oscar Heymann, *vice* Mr. R. Heymann; Rand Collieries, Ltd., Mr. A. French, *vice* Mr. J. F. Hawkins; New Kleinfontein Co., Ltd., Mr. G. W. Higgins, *vice* Mr. C. P. Marais; Nourse Mines, Ltd., Mr. J. H. Rainier (as the second representative of the company); City Deep, Ltd., Mr. B. Madew, *vice* Mr. F. Perry.

* * * *

A special general meeting of the Institution of Engineers was held last Saturday evening, Mr. J. A. Yule in the chair. Messrs. Martyn, Ivor Williams-Ellis, Harry Rhodes, W. S. Carr and T. Ferris were recommended for membership, and Messrs. J. W. Clark and A. B. Young for associate membership. Mr. K. K. H. Sartorius was elected to membership, and Messrs. H. E. Ording, G. S. Talman, W. Harrison, A. W. Jones, A. M. Baker, J. A. Lea, C. J. Farquhar and H. L. Carpenter as associate members. Mr. Williams-Ellis's paper presented to the Institution, describing "Cascade" Singer and multi-speed motors, was discussed in an interesting manner by Mr. H. J. S. Heather. By the aid of blackboard diagrams, the salient features were noted, enabling a more rapid grasp of the significance of this new development in motor construction. Mr. H. B. Greer's paper on "The margin of safety required by Government for man haulage at great depths," gave rise to considerable discussion.

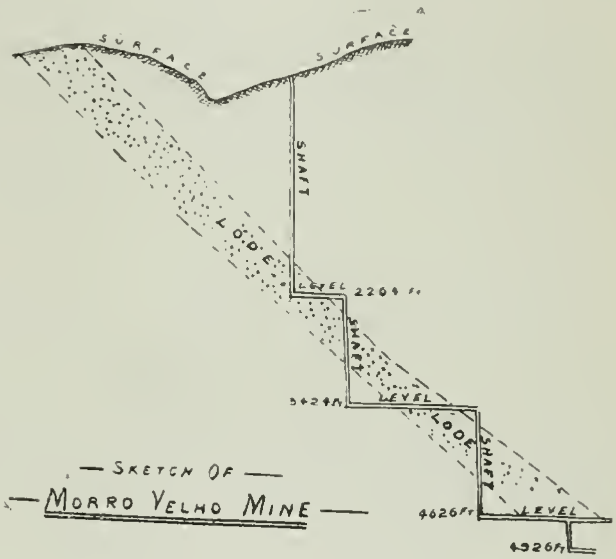
THE WORLD'S DEEPEST BOREHOLES AND MINES.

Some Statistics Bearing on the Question of Depth.

[By a Correspondent.]

It is not at all an easy matter to always keep in touch with the mining progress of the world, and Mr. Hoffmann's claim that the Vlakfontein borehole is the deepest in the world is very much out of date, as more than 25 years ago the Schladebach borehole in Merseburg, Prussia, had attained a vertical depth of 5,736 feet, prior to which date, I believe, the Sperenberg borehole, near Berlin, had been considered the deepest with a depth of 4,170 feet. Since that date, however, other deeper boreholes have been put down in Silesia, that at Paruschowitz, for instance, to a vertical depth of 6,429 feet, but the deepest of all is a borehole at Gzuchow, 7,348 feet deep, a depth which I am not aware has been exceeded in any part of the world. These boreholes were surveyed, and showed no pronounced deflection, because the conditions are not so conducive to deviations from the vertical as seem to exist on the Rand. There is also a borehole in France near Pont a'Mousson, over 5,100 feet in depth, so that it will be seen that the Vlakfontein borehole has several successful rivals to the claim of being the deepest borehole in the world. As pointed out, it is, however, possible that there may be some deep boreholes in America, but, personally, I know of none except in Western Virginia, where the depth runs between four and five thousand feet. I do not wish to detract from the value of Mr. Hoffmann's paper, which principally lies in showing to what perfection borehole surveying has attained on the Rand, and the liability existing here for boreholes to seriously deflect from the vertical. There is nothing new in the artificial deflection of boreholes, as thirty years ago the Owthorpe boring near Nottingham was deflected half-way down by the insertion of wedges owing to the hole having become blocked with broken rods and crown. In the early days of diamond boring, crowns were frequently lost, and the cause of much trouble; and, sooner than abandon a hole when they could not be recovered, the artificial deflection of a borehole was comparatively common.

With regard to the deepest mine in the world, that honour belongs to the No. 3 Tamarack shaft in Lake Superior copper regions, with a vertical depth of 5,222 feet, and along the incline the total vertical depth attained was some time ago 5,368 feet, whilst No. 5 Shaft of the same group has a vertical depth of 5,273 feet. The No. 4 Calumet incline shaft is probably the deepest incline shaft measured on the slope of any in the world, as its length is 8,100 feet, according to the latest available information. Until quite recently the deepest gold mine in the world was at Bendigo, where the Victoria Reef quartz mine on the New Chum lode had attained a depth of 4,600 feet, but this depth has now been exceeded at the Morro Velho mine, belonging to the St. John Del Rey G.M. Co., in Brazil, South America, where a year ago a total depth from the collar of the shaft of 1,926 feet had been attained. An interesting feature about this deep mine is that the ore is raised at four different stages. It is, I believe, the intention to go down to a depth of 6,500 feet ultimately, where it is anticipated that the rock temperature will be about 117° F. It is also the intention of the Victoria Reef Mine at Bendigo to go down to a depth of 5,254 feet, so that it is possible that the South American gold mine may, for some time at least, have again to take second place, and it is difficult, perhaps, to say with confidence at any moment which may be actually the deepest gold mine in the world. At Bendigo, as on the Rand, poor bodies of ore alternate with good ones, and even at this deep mine, at 4,600 feet, the yield was only 1 dwt. to the ton, but in order to strike, if possible, pay ore, the company intends to sink, if necessary, to a depth of 5,254 feet. In conclusion, it may be pointed out that if the Rand does not possess the deepest gold mine in the world, there seems every probability that it will not be long before it can claim that honour. Conditions on the Rand are more favourable for deep mining than in any other field in the world—the foot and hanging walls are better; the increase of temperature with depth is less, and, so long as the reef is payable, mere depth is of minor importance.



Robinson G.M.

The development for the quarter has been satisfactory, high grade south reef having been exposed on the 17th and 18th levels. The residues, since the installation of the Butters filter press, have been very materially reduced. The profits declared (£254,428) are considerably less than those for the previous quarter, principally due to the loss of tonnage on account of accidents underground. It is not expected that the profits for the ensuing quarter will exceed £65,000 per month, on account of the expected drop in the grade of ore mined, owing to the necessity for increasing the proportion of main reef as compared with the two richer reefs. Costs per ton milled have been higher on account of the reduced tonnage, but it is expected that a return to more normal costs will soon be made, although it is not anticipated that they can again reach the exceedingly low standard previously reached. Sand filling has been carried on continuously, and it is hoped shortly to further largely increase the tonnage of sand lowered into the mine. The capital expenditure for the quarter amounted to £1,514 5s. 2d., being chiefly on sands filling. The amount already authorised and still to be expended on capital account is £4,582, made up of £4,181 for sand filling and £401 for air meter house and station. No further capital expenditure is contemplated at present unless it is found necessary to extend the sands filling plant beyond what is at present in hand.

Rose Deep.

The native labour position has improved during the quarter, which, to a large extent, accounts for an increase of 4,900 tons milled. Capital expenditure for the quarter amounted to £3,241, and beyond the sum of approximately £5,250 necessary to complete the programme in hand, no capital expenditure is contemplated in the near future.

IRIDOSMINE FROM THE NEW RIETFONTEIN MINES: ITS OCCURRENCE, ANALYSIS AND GENESIS.—II.

[By C. Baring Horwood, B.Sc. (Lond.), A.R.S.M., M.I.M.M., Assoc.M.Inst.C.E.]

The plate accompanying this paper shows two spectra of the concentrates. The lower one represents the first analysis; and the upper one is the result of the second analysis. The strong osmium and ruthenium lines have been lettered, but not the iridium lines as they are too weak to be readily recognisable in a photograph. In each case the spectrum given by the silver poles alone is shown immediately below the spectrum of the concentrates, so that those lines in the latter which are merely due to the poles can be seen at a glance.

Through the courtesy of the Transvaal Mines Department, and Mr. R. N. Kotzé, the Government Mining Engineer, an official request was forwarded to the Imperial Institute at South Kensington that a quantitative analysis of this concentrate might be made. The director, Professor Wyndham R. Dunstan, F.R.S., very kindly undertook to have this done; and, the remainder of the sample, after the spectroscopic analysis had been made, was, therefore, handed over to the Imperial Institute authorities. The following is a quotation from the Director's report :—

"*Description of Sample* :—The sample received at the Imperial Institute weighed about 20 grams,[*] and consisted of a dark fine-grained heavy metallic concentrate. It contained globules of mercury which had probably been introduced during its passage over the battery plates in the process of concentration."

"*Results of Examination* :—The mercury originally present in the concentrate was removed by heating the material prior to analysis; the decrease in weight, which was almost entirely due to loss of mercury, amounted to nearly 12 per cent. After removal of the mercury the concentrate had a specific gravity of about 19, and was found to have the following composition :—

	Per Cent.
Gold	1.24
Platinum	0.61
Iron (expressed as Fe_2O_3)	1.29
Nickel (expressed as NiO)	0.66
"Osmiridium" (Ir. Os. & allied metals)	95.52

"The osmiridium was found to contain about 45 per cent. of iridium.

"The above results indicate that the concentrate consisted essentially of the mineral iridosmine. The gold was amalgamated with the mercury in the material as received; but the platinum was probably in a free state. Some of the iron was also present in a free state, and was most likely derived from the stamp-shoes used in crushing the ore. The remainder of the iron was probably for the most part in combination with the nickel."

He pointed out that the results of a single analysis may be very misleading, as experience has shown that osmiridium varies greatly in composition, even in the case of samples from the same locality, and that a marked instance of this occurs in the case of an already known South African source of supply.

Genesis :—As regards the origin of these rare metals, one should remember that the atomic weights of iridium and osmium are 193 and 191 respectively (†), and that the elements of highest atomic weight are, on the whole, relatively the rarest in rocks.[1] If one could explain why the elements of high atomic weight are rare, then as Professor R. K. Duncan has pointed out, we should probably have the explanation of the genesis of matter.[2]

The forty years' work of Sir Norman Lockyer has familiarised the world with the conception of an inorganic evolution in the sun and stars, by which the heavy elements are synthesised out of the lighter ones. Sir Norman Lockyer,[3] years ago, suggested a classification of the stars according to their supposed differences of temperature; and he ranged certain elements in the order of their appearance in these stars. On the other hand, the radio-active elements radium, thorium, uranium, etc., possess the heaviest atoms known: and, their radio-activity seems to depend upon their disintegration into simpler elements. It may be that the lighter elements are taking up as much energy to evolve into the heavier elements as is given up by the latter in disintegrating into the former.[4]

In considering the genesis of this particular occurrence of metallic elements of him atomic weight, it should be clearly borne in mind that the gold-bearing Rand bankets[‡] really differ in no important essentials from ordinary gold-bearing quartz veins; in other words, they have merely played the part of fissures, in which mineral matter has been deposited from circulating solutions: and, the channels have finally become closed by the deposition of secondary silica, which is analogous to the vein quartz of an ordinary lode. The big diabase dykes, which occur in almost all the mines of the Rand, are abundant, and sufficient, evidence of former deep-seated communications with these channels, whence the mineralising solutions may have ascended. The iridosmine and associated metals have not been recognised in situ underground, nor yet in hand specimens; they are associated with the gold and pyrites; they seem mostly to occur in that auriferous banket reef known as the Carbon Leader, which is distinguished by the abundant presence of carbon; and, further, they occur with a small proportion of nickel.

The original source of nickel ores is the basic igneous rocks; these ores are usually, though not invariably, a product of differentiation of igneous magmas.

An instance is given by Messrs. Thomas & MacAlister[5] of the association of iron, nickel and carbon, with a small percentage of cobalt, occurring as a differentiation product of a basalt porphyrite on Disco Island, off the west coast of Greenland. Iron, in the form of iron pyrites, is an important constituent of the Rand bankets. The amount of iron pyrites present is probably 2 to 3 per cent.[6] Nickel and cobalt also occur in minute quantities in the bankets.[7] The genesis of the carbon has already been traced to the basic dykes, which are so much in evidence in practically all the gold mines of the Rand[8] and which have been shown to contain appreciable amounts of carbon, iron pyrites, gold, silver,[||] and sometimes traces of cobalt; and it has been suggested that the gold in the bankets may be derived from the same source.[9]

The original home of the metals of the platinum group, often with some gold and chromite, is admittedly the ultra-basic and basic igneous rocks;[10] in which they usually occur as primary segregations formed by magmatic concentration, which as Vogt[‡] remarks clearly indicates their original presence in minute proportion in these rocks.[11]

Thus, the original home of the platinum metals in other parts of the world; and, the minerals with which they are here associated at once suggest that at the Rietfontein mines they are not an original constituent of the banket but were introduced at a later date, their original source probably being the big basic dykes which are so much in evidence in these mines. The arguments in support of this may be summarised as follows :—

1. The iridosmine, and the gold with which it is associated, is crystalline; and does not show evidence of being water-worn, as one would expect it to do, if it were an original constituent of the banket.
2. That it is reasonable to assume that these basic dykes contain minute traces of the metals of the platinum group.

Thus, Vogt[‡] has called attention to the original tenor in the magma of the small proportion of platinum metals which has, in recent years, been found in the segregated sulphide-ores of gabbro rocks, a fact which requires the supposition that the gabbro magma originally contained them. He writes :—"Some conception of this original tenor of platinum metals may be formed from the statement that the nickeliferous pyrrhotites of Sudbury contain, according to many analyses, from 25,000 to 90,000 times as much nickel as platinum metals; while the original proportion of nickel in the gabbro magma may be set down as about 0.05 per cent. Hence on the (somewhat arbitrary) assumption that the platinum metals were concentrated from the magma to the same extent as the nickel, the magma contained, roughly, 0.000001 per cent. of these metals. This figure, of course, has no pretension to accuracy; but we have at least learned that even the platinum metals are among the normal constituents of the basic eruptive rocks."

At the Rietfontein gold mines it took about six months to collect about 910 grains of the heavy concentrates, during which time 102,800 tons of ore were crushed, and over 52,500 ounces of fine gold were recovered.

From these figures it would seem that the Rietfontein pay reefs contain about 27,500 times as much gold as metals of the platinum group. The neighbouring diabase dykes contain gold,[§] but there is not sufficient available data to indicate what was the proportion of gold in the original magma; it was probably far less than that of the nickel in the case just cited. It is, therefore, impossible to estimate the percentage of the platinum metals in the magma on the assumption that they were concentrated from it to the same extent as the gold. However, it is just as reasonable to assume that the diabase magma originally contained them as it is to assume (as Vogt has done) that the gabbro magma, in the Sudbury occurrence, originally contained them.[12]

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[*] About 309 grains.

[†] The atomic weight of gold = 197; and that of ruthenium = 102.

[‡] The barren banket beds are analogous to the barren quartz lodes, which so frequently also occur in the neighbourhood of gold-bearing quartz veins.

[||] C. B. Horwood, loc. cit. The presence of silver in the dykes was not discussed; but, in assaying the dyke samples, the differences between the bullion weights and the weights of the fine gold consisted chiefly of silver.

[‡] Vogt loc. cit. pp. 640 and 642. Also see the following footnote on the latter page: "It may be added here that, so far as known, all primary platinum deposits were formed by igneous fusion, and that the platinum metals are either wholly wanting, or only exist in minute traces in deposits from aqueous solution. The latter fact may be due to the small susceptibility of these metals, which are, for example, much less soluble in aqua regia than gold." (See Zeitsch, f. prakt. Geologie. 1898, p 321.)

[§] The Mode of Occurrence and Genesis of the Carbon in the Rand Bankets, by C. B. Horwood. Trans. Geo. Soc., S.A. Vol. XIII. (1910), p. 76, where the origin of the gold is referred to the neighbouring diabase dykes, which are shown to contain gold, except in the oxidised zone where it has been leached out.

A paper read before the Geological Society of South Africa on the 13th May, 1912.

3. It is associated with nickel and chromium; and, it is generally admitted that both of these, as well as the metals of the platinum group, of which the concentrates consist, are derived from the ultra-basic and basic igneous rocks.[13] At the Rietfontein mines such basic rocks are well represented by strong, persistent, diabase dykes,‖ 80 to 120 feet and more in thickness, which occur throughout the entire length of the mines, that is for a distance of nearly two miles.
4. Below is shown Mendeléeff's table of the elements, as arranged by him, as recently as 1904, to include all the known elements except the "rare earths."

The third analogous series of this group consists of osmium, iridium, platinum and gold. The chemical analysis and both spectroscopic analyses showed that the Riotfontein concentrates were largely composed of these first two elements. The chemical analysis disclosed the presence of platinum, and the spectroscopic investigation of the first sample had also suggested its presence. In Rand bullion gold accounts for about 875 parts per thousand. This curious association, in the Rand bankets, of these twelve elements, agreeing, as it does, in such a striking way with their chemical association and their grouping by Mendeléeff according to their atomic weights, valencies and other chemical properties, is too remarkable to be purely accidental, and, must surely indicate a very close association between them as regards their actual genesis. If, then, as regards their occurrence on the Rand, a particular origin be admitted for any one of them, it would seem that a similar origin must be admitted for them all.

5. They occur associated with gold, silver, pyrites, carbon and traces of cobalt, all of which have already been shown to occur in the adjacent diabase dykes.* The most recent investigations point to the basic dykes as the source of the gold of the bankets;†† and it has been shown that the carbon, which

MENDELÉEFF'S TABLE OF THE ELEMENTS.

Series.	Zero Group	Group I.	Group II.	Group III.	Group IV.	Group V.	Group VI.	Group VII.	GROUP VIII.		
0	x	—	—	—	—	—	—	—	—	—	—
1	y	Hydrogen H=1·008	—	—	—	—	—	—	—	—	—
2	Helium He=4·0	Lithium Li=7·03	Beryllium Be=9·1	Boron B=11·0	Carbon C=12·0	Nitrogen N=14·04	Oxygen O=16·0	Fluorine F=19·0	—	—	
3	Neon Ne=19·9	Sodium Na=23·05	Magnesium Mg=24·1	Aluminium Al=27·0	Silicon Si=28·4	Phosphorus P=31·0	Sulphur S=32·06	Chlorine Cl=35·45	—		—
4	Argon Ar=38	Potassium K=39·1	Calcium Ca.=40·1	Scandium Sc=44·1	Titanium Ti=48·1	Vanadium V=51·4	Chromium Cr=52·1	Manganese Mn=55·0	**IRON** **Fe=55·9**	**COBALT** **Co=59**	**NICKEL (Copper)** **Ni=59**
5	—	Copper Cu=63·6	Zinc Zn=65·4	Gallium Ga=70·0	Germanium Ge=72·3	Arsenic As=75·0	Selenium Se=79·0	Bromine Br=79·95	—	—	—
6	Krypton Kr=81·8	Rubidium Rb=85·4	Strontium Sr=87·6	Yttrium Y=89·0	Zirconium Zr=90·6	Niobium Nb=94·0	Molybdenum Mo=96·0	—	**RUTHENIUM** **Ru=101·7**	**RHODIUM** **Rh=103·0**	**PALLADIUM (Silver)** **Pd=106·5**
7	—	Silver Ag=107·9	Cadmium Cd=112·4	Indium In=114·0	Tin Sn=119·0	Antimony Sb=120·0	Tellurium Te=127	Iodine I=127	—	—	—
8	Xenon Xe=128	Caesium Cs=132·9	Barium Ba=137·4	Lanthanum La=139	Cerium Ce=140	—	—	—	—	—	—
9	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	Ytterbium Yb=173	—	Tantalum Ta=183·0	Tungsten W=184	—	**OSMIUM** **Os=191**	**IRIDIUM** **Ir=193**	**PLATINUM (Gold)** **Pt=194·9**
11	—	Gold Au=197·2	Mercury Hg=200·0	Thallium Tl=204·1	Lead PC=206·9	Bismuth Bi=208	—	—	—	—	—
12	—	—	Radium Rd=224	—	Thorium Th=232	—	Uranium U=239	—	—	—	—

It will be observed that in this table the characteristic elements of the Rand Bankets, i.e., Gold, Silver, Iron, Cobalt, Copper and Nickel, together with the metals of the Platinum Group, form three analogous series and all occur in Group VIII.

In this table the metallic elements which characterise the Rand bankets, together with those constituting the platinum group, are indicated in heavy type. As shown at the beginning of this paper, the latter have been found at several other mines as well as at Rietfontein; and, probably, closer investigation would show that they occur, in minute quantities, more or less generally throughout the mines of the Rand, as traces of the platinum metals are invariably found when the gold, as despatched from the Rand, is refined. From this table it will be seen that these elements occur as three analogous series in the same group (group VIII. of the table). It is true that copper, silver and gold are usually considered as occurring in series 5, 7 and 11, respectively, under group I. It will, however, be seen that Mendeléeff indicates their very close relationship to the three analogous series of group VIII. by also including them, in brackets, under that group. In the first analogous series of this group are iron, cobalt, nickel and copper. Iron is largely present in the Rand bankets, chiefly in the form of iron pyrites, which, as previously stated, occurs in quantities varying from about two to three per cent.[11] Cobalt, nickel and copper occur in minute quantities throughout the mines of the Rand.[15] Ruthenium, rhodium, palladium and silver form the second analogous series. Both spectroscopic analyses showed that ruthenium was largely present in the heavy concentrates from Rietfontein. The probable presence of rhodium and palladium was established by the first spectroscopic analysis. Silver occurs associated with the gold of the Rand to the extent of above 125 parts per thousand of bullion.[16]

‖ In this connection it might be mentioned that Messrs. Thomas and MacAlister (loc. cit., pp. 27 and 28), in reference to the differentiation in the case of *dykes*, remark that the segregated minerals are identical with those from similar magmas existing in larger masses, but that the differentiation is not often so well displayed.

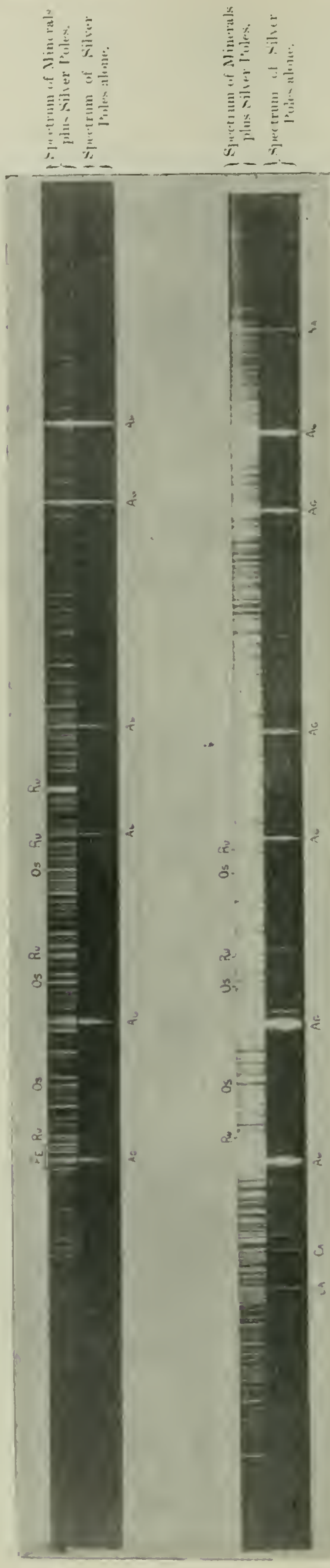
In the "Chemical News" (Vol. 104, p. 283), Mr. A. G. French describes what is claimed to be a newly-discovered element, which he discovered in British Columbia, and calls canadium. The metal, which is described as probably belonging to the platinum group, occurs in metallic grains, and scales along with other platinum metals in *dykes* in the granite.

* C. B. Horwood, loc. cit.

†† C. B. Horwood, loc. cit.

Professor R. B. Young admits that the very close association of pyrrhotite with chlorite in the bankets indicates that the introduction of at least a considerable portion of the pyrrhotite must be attributed to the basic intrusions; and, that bankets and quartzites at their contact with dykes, are sometimes crowded with well-formed crystals of pyrite. He refers to the frequent association of calcopyrite and pyrrhotite, and states that he understands, on reliable authority, that sometimes the proximity of a dyke is manifested by the appearance of a noticeable quantity of calcopyrite, galena and pyrrhotite in the pannings of the banket. Later, in the same paper, he states that in many instances the occurrence of pyrrhotite, chalcopyrite, sphalerite and galena is clearly related to basic intrusions and admits that doubtless some of the pyrite has also been derived from the same source. He also admits the close relationship between the gold and pyrite, and that in certain instances, like that described by Truscott ("The Witwatersrand Goldfields" (London), 3rd edition, 1907, p. 111), in the Worcester Mine, a relation exists between basic intrusions and the gold contents of the banket reefs. Mr. M. Weber had just previously shown (Trans. Geo. Soc., S.A., Vol. xii., 1909) that there were some acid intrusives in the Witwatersrand system, and that they contained traces, and sometimes rather more, of gold. These are of very rare occurrence in the mines of the Rand, whereas the basic dykes are everywhere in evidence. Yet, Prof. R. B. Young concludes his paper and his discussion on the origin of the gold

continued on next page.



SPECTRA OF RARE MINERALS FROM THE NEW RIETFONTEIN ESTATE GOLD MINES

occurs so intimately bound up with the gold is derived from these older (longitudinal) diabase dykes.[17] It is, therefore, reasonable to conclude that the iridosmine and associated platinum metals come from the same source.

CONCLUSIONS :—The conclusions, based on the foregoing arguments, are, firstly, that these metals are certainly of secondary origin; and, secondly, that they probably occurred in minute proportions, as primary segregations formed by magmatic concentration,[18] in the basic eruptives occurring in these mines; and, that by the last, or pneumatolytic phase** of eruptive activity they were extracted from the dykes by active superheated gases.†† Later still, hydrothermal action probably played an important part in concentrating them in the banket reefs.

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[2] The Chemistry of Commerce by Prof. R. K. Duncan (Harper Bros.), chap. Rare Earths and their Application.

[3] Proc. R. Soc. LXI., p. 204.

[4] Prof. R. K. Duncan, loc. cit. Also: Crookes on the "Genesis of the Elements," Brit. Assoc. Report Birmingham, 1886. Presidential Address by Sir Wm. Crookes, Trans. Chem. Soc., 1888. "The Evolution and Devolution of the Elements," by A. C. & A. E. Jessup. Phil. Mag. (VI.), XV., p. 21 (1908); and The Elements by Sir Wm. A. Tilden, chap. 1 (Harper Bros.).

[5] The Geology of Ore Deposits (Edward Arnold), 1909, pp. 35 and 36.

[6] C. B. Horwood, Trans. Geo. Soc., S.A., Vol. XIII., 1910, p. 72.

[7] This has been proved by Mr. Andrew F. Crosse—vide C. B. Horwood, loc. cit., p. 77.

[8] C. B. Horwood, loc. cit.

[9] C. B. Horwood, loc. cit., pp. 76 and 77, also "Notes and Analyses of Typical Transvaal Rocks," by the same author, Trans. Geo. Soc. S.A., Vol. XIII., 1910, pp. 42 and 43.

[10] Thomas and MacAlister, loc. cit., pp. 34 and 35. Vogt, loc. cit, p. 640.

[11] Vogt, loc. cit., p. 640.

[12] See Thomas and MacAlister, loc. cit., pp. 34 and 406.

[13] J. H. L. Vogt, loc. cit., pp. 640 and 641. Thomas and MacAlister, loc. cit., pp. 31-37.

[14] C. B. Horwood, loc. cit, p. 72.

[15] C. B. Horwood, loc. cit., p. 77.

[16] C. B. Horwood, loc. cit., p. 82.

[17] C. B. Horwood, loc. cit.

[18] Vogt, loc. cit., p. 640.

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by stating in italics that he thinks it probable that "*the acid intrusives are the original source of some of the gold*" in the Main Reef series.—"Further Notes on the Auriferous Conglomerates of the Witwatersrand with a Discussion of the Origin of the Gold." Trans. Geo. Soc., S.A. (Vol. xii., 1909). Inasmuch as the paper is supposed to deal with the origin of the gold in the bankets the impression is given that he inclines to the theory that the acid intrusives have played a more important part as a source of the gold than the basic dykes. In this the present writer disagrees with him, and would point out that Prof. R. B. Young's own statements and arguments indicate that the *basic dykes* are the chief source of the gold in the Rand bankets.

** Prof. R. B. Young (loc. cit.) calls attention to the appreciable amount of tourmaline, of undoubtedly secondary origin, in the Rand bankets, and its close association with the gold; also, to the occasional occurrence of tourmaline veins in the bankets, and to the fact that tourmaline sometimes replaces portions of the quartzites and bankets; but, he does not seem to have realised the full significance of these facts as strongly suggestive of pneumatolytic action.

See Thomas and MacAlister, loc. cit., chap. 3.

†† For an explanation of the eruptive processes by which the heavy metals have been derived from magmas, the writer would recommend the careful study of Prof. Vogt's treatise, already quoted.

Vide also, "The Role of the Igneous Rocks in the Formation of Veins," by Prof. J. F. Kemp, in "The Genesis of Ore Deposits" (1901) (published by the Am. Inst. M. Engr.), pp. 681 and 709. In this paper Kemp, in illustrating the competence of igneous magmas to supply both the contents of veins and the solutions which are the common carriers of the minerals, laid special stress on the fact that igneous rocks contain the metals more abundantly than the sedimentary rocks do; and, also, that igneous rocks are richly provided with vapours which come up with them from great depths.

MINERS' PHTHISIS AND ALCOHOL.

Drink Causes a Predisposition to the Disease—Sensational Views of Medical Authorities.

How far alcohol is a predisposing cause of phthisis on the Rand is now engaging the attention of many medical men and others. It is noteworthy that Sir Victor Horsley, M.D., in his well-known work on "Alcohol and the Human Body," sets out the case against alcohol very clearly. He points out that the most important result in relation to this matter of general degeneration and disturbance of the metabolism of the body by alcohol, is the fact that the tissues of persons who take alcohol are less able to resist disease. Under the influence of alcohol the white corpuscles are less vigorous than is normal in their crusade against invading germs, and consequently these latter obtain an undue footing in the body, and create havoc. Professor Laitinen sums up the result of his prolonged and elaborate researches into the effects of small doses of alcohol in these words: "It seems clear, therefore, that alcohol, even in comparatively small doses, exercises a prejudicial effect on the protective mechanism of the human body." Professor Welch, the distinguished American pathologist, says: "This lowered resistance is manifested both by increased liability to contract the disease and by the greater severity of the disease." In the case of illnesses such as pneumonia and blood-poisoning, which are caused by microbes now thoroughly well known and identified, it is proved that the alcoholic habit notably diminishes the power of the tissues to resist the invasion by these same organisms. It is a recognised clinical fact that a drinker is less resistant than he should be to attacks of cholera, consumption, pneumonia and blood-poisoning in all its forms. During the cholera epidemic in Glasgow in 1848-9, Adams observed 225 cases, and found a death-rate of 19·2 per cent. among abstainers, and 91·2 per cent. among those addicted to the use of alcohol. Experiences in other parts of Europe and America have confirmed these observations.

Pneumonia.—Alcoholism is believed by many to predispose to pneumonia. Thus Dr. Raw, the Medical Superintendent of the Mill Road Infirmary, Liverpool, when relating his experience in the treatment of 1,047 cases of pneumonia, with 246 deaths, said: "Alcoholism is the most potent predisposing factor, and I have now come to look upon the previous alcoholic condition of a patient as the arbiter of his life when attacked by pneumonia." With regard to treatment, it is now accepted that any routine treatment with alcohol involves grave risks. Dr. Muirhead, of Edinburgh, pointed out years ago that the death of a case of pneumonia uncomplicated by alcoholism was of the rarest occurrence, and that patients recovered without its use medicinally. Even when this disease is complicated by influenza, there are not wanting physicians of experience who triumphantly "pull their patients through" by means of drugs other than alcohol, which, indeed, they regard as especially deleterious in cases already suffering from influenzal poisoning. Sir Victor Horsley explains the twofold way in which alcohol renders the lungs liable to disease. First, he says, let it be remembered that persons with whom its use is habitual are more liable than others to an irritation of the mucous membrane of the throat, which they are always attempting to "clear." This is not in itself dangerous, but when a similar condition of catarrh supervenes in the large tubes of the lungs, the healthy condition of these disappears, and the patient becomes more liable to bronchitis and to infection by the germs of tubercle and pneumonia. Secondly, the repeated taking of alcohol leads to a dilatation of the blood-vessels of the lung, and these vessels being extremely numerous, a tendency to congestion occurs. Lungs in this condition of incipient congestion are readily affected by climatic falls of temperature, and by the presence of bacteria, and the outlook when such lungs become actively diseased is proportionately serious.

Consumption, or Tuberculosis.—In this connection he says: The susceptibility of the lungs of those who indulge in alcohol explains the high death-rate from consumption that is found to occur in places where it is freely taken. Observations made recently in France by Dr. Bauderon show that in certain districts where there is only a moderate indulgence in alcohol (12·5 litres per annum per person), the death-rate from tuberculosis is only 3·3 per 1,000 inhabitants. On the other hand, in a district where the amount taken rises to 35·4 litres per person per annum, the death-rate for the same disease is 10·8 per 1,000, *i.e.*, three times as great as in some other parts of France. In the sanatoria for consumptives at Loslau there are, according to statistics compiled in 1899 by Hoppe—30 per cent. of avowed alcoholics; 27 per cent. of moderate drinkers (only drinking large amounts of beer); 27 per cent. persons drinking very little; 6 per cent. total abstainers. In one infirmary ward for consumption Dr. J. Hay found that of 36 patients, 34 admitted alcoholic excess. These and other facts have made a profound impression on Europe, so much so, that at the International Congress on Tuberculosis, which met in Paris in 1905, the following resolution was passed: "That in view of the close connection between alcoholism and tuberculosis, this Congress strongly emphasises the importance of combining the fight against tuberculosis with the struggle against alcoholism." Not only does the man who indulges in alcohol lay himself open to chances of tubercular infection, but his children appear to be born with a diminished power of resisting this disease. The children of drinkers are frequently attacked by hip-joint disease, spinal disease, joint swellings, glandular swellings, "consumption of the bowels" and of the lungs, even although the parents are not tuberculous.

Arrangements are nearly complete for the tenth annual session of the S.A. Association for the Advancement of Science, which is to be held at Port Elizabeth under the presidency of Dr. A. Theiler, C.M.G., during the week beginning Monday, July 1. Of section B, Professor Van der Riet, of Victoria College, is president. The sectional secretaries are: Mr. J. G. Rose, F.C.S., Cape Town, and Mr. J. E. Devlin, F.C.S., Vryheid, Natal. This section comprises chemistry, geology, metallurgy, mineralogy, and geography, in connection with which six papers have thus far been promised. These are the sectional president's address, a paper by Professor Rindl, of Grey College, Bloemfontein, and the following: "Inclusions and Veins in the Stellenbosch Granites," by Professor Shand; "Boring Operations at Zwartkops, and the Thermal Chalybeate Spring," by G. W. Smith, A.M.I.C.E.; "Laccolites and Bysmalites," by Professor E. H. L. Schwartz, of Rhodes University College, and "A New Compound of Carbon," by E. G. Bryant.

The Quest.

The output from the Quest Company for April is not recorded in the published list of returns, but the profit is chronicled as £733, as compared with £768 in March.

Geldenhuis Deep.

Owing to the supply of ore from the north section gradually diminishing, it was decided to close down the north mill. Arrangements were completed for transporting the ore from the north shaft to the east and west mills, and the north mill was shut down in January. The stage hoist in No. 2 shaft was erected and put in commission during the quarter, thus removing the restriction to stoping operations below the 13th level in the shaft, but some delay occurred in obtaining a smooth run. It is hoped that the difficulties experienced which have adversely affected the tonnage crushed, will be overcome shortly, and that normal working conditions will obtain as from May 1st. Owing to the temporary curtailment of development operations in the lower levels of the east section, incidental to the installation of the stage hoist, the development footage was somewhat below that of the previous quarter. Every effort is being made to reduce working costs, which have been abnormally high of late.

ACCIDENTS IN MINES OF THE RAND.

Safety and Dividends—Mr. J. Chilton's Views.

At the meeting of the Chemical, Metallurgical and Mining Society, held at the South African School of Mines on Saturday evening, Mr. J. Chilton read the first portion of his reply to the discussion on his paper entitled "Accidents in Transvaal Mines; with special reference to falls of ground." The paper was read a considerable time ago, and has called forth a long, useful and extremely interesting discussion. Mr. Chilton welcomed the criticisms of his paper, but he saw no reason to recede from the position he had taken up. The charge he had made that there was an excessive sacrifice of human life in the Transvaal mines had not been disproved either by argument or by evidence, and the figures he had given had passed unchallenged. Consequently, there was nothing to regret or to recant. He wished to arouse public opinion to a sense of the importance of the subject, for he felt that unless a fierce ethical light was brought to bear upon the squalid facts of our industrial life there was the danger that the discussion would be useless. Mine managers and all connected with the mines having a high accident rate should be made to feel the ignominy of their position and should be held up to public opprobrium. Coming to the various suggestions put forward by the contributors to the discussion, Mr. Chilton thought that any machinery or method of working that was likely to increase the danger to life or limb should be the subject of special investigation by an officer representing the Government, and every effort should be made, by magnate and miner, to change the industrial condition so that the working places would become more like mines and less like abattoirs. He pleaded for the appointment of a Commission—"only a little one"—to enquire into the high accident rate. England, with one-quarter the accident rate, had appointed a Commission, and the reduction in the accident rate could be traced to their labours. On mine managers laid a large portion of the blame for the present unsatisfactory state of things. He knew they were not deficient in those softer qualities which marked the man, but he doubted whether they had given the subject the study or consideration which was requisite. One reason for managerial apathy was the difficulty of showing in pounds, shillings and pence the result of safety measures; they were not always apparent in the dividend list, but accident prevention had its economic as well as its humanitarian aspect.

THE LANGUAGE PROBLEM.

He (Mr. Chilton) had been criticised for comparing our mines with those of England, but it had to be remembered that in any comparison between coal and metal mines the advantages were in favour of the latter. The coal mines in England were invariably troubled with explosive gases and coal dust. In 1910 there were 18 explosions of gas or coal dust, which cost 500 lives. That form of accident did not occur in the Transvaal. Falls of roof and sides were not so frequent in metal mines; in 1910 falls were the cause of 40 per cent. of the English accidents, while for the same period in the Transvaal the rate was only 21 per cent. of the total death rate. The quantity of material excavated had also a bearing on the accident rate, for the bigger the space excavated the larger was the roof which needed support and the greater the probability of falls. It had to be borne in mind that in 1910 England raised 271 millions of tons against the Transvaal's 26 millions. Yet, in spite of the smaller tonnage extracted, the death rate was 31.5 per million tons as against the English rate of 6.51. Dealing with the subjects of changes, unskilled miners, and the nomadic habits of miners, all of which had been urged as excuses for the high death rate, the authors of these suggestions, said Mr. Chilton, had not taken into account the fact that a good number of our mines had a death accident rate below the English standard. Taking the 66 producing mines that appeared in the accident list for 1910, there were 23 that had an accident rate less than 1.91—the English rate for that year. The Primrose, Simmer Deep, Knights Deep, and Village Main Reef had rates that were below the million tons rate of England, and it had been done without sacrificing dividends. If these mines could do it, others could do so. The language question was a difficult one, but it was certainly productive of accidents, and it was hard to solve. In America, regulations were posted up in seven or eight different languages, but this was not effective. To prohibit all persons unacquainted with English from working in the mines was too drastic a measure in a cosmopolitan place like the Transvaal; Germany had adopted such policy, but it had been rejected in the cases of Fife and Lanarkshire. He (the speaker) worked on a mine where 450 natives from tropical Africa were employed. They did not understand Rand Kaffir, and no man underground could speak their language. Yet there had been no serious accident, simply because great care was taken. Touching on the suggestion that a shift boss should examine every working place before a start was made, it had to be pointed out that the average boss supervised about 300 natives, each of whom had a working place. In England he had not seen any section which contained more than 30 working places; some had as few as 16. To adopt the English method would be to add a heavy burden to the costs.

A SPIRIT OF NEGLIGENCE.

Having referred to first aid, Mr. Chilton went on to deal with the point in regard to incompetent miners. Such men had to be engaged because the demand for competent men was greater than the supply. He could not agree with the practice of endorsing a man's certificate after an accident, as it savoured too much of the eternal punishment of the theologians. The practice brought the Mines Department into contempt, and was not effective because the miner lost his endorsed certificate or obtained a new one. The Transvaal mines were handicapped by various forms of inefficiency, and that aspect of inefficiency which was represented by a large accident rate should not be ignored. Safety measures had been and were being neglected in a large number of mines, but the manager who was careless of the lives of his workmen would probably be careless with the dividends of his company. The time had come when technical skill, however brilliant, and industrial talent, however deserving, must be rejected if these qualities were accompanied by a callous disregard for human life and suffering. Mine managers could not be blamed for all the accidents which occurred, but they were responsible for the creation of that spirit of negligence which was fruitful of accidents in the Transvaal; managerial apathy could permeate the whole mine. If boards of directors and consulting engineers notified their managers that a high and persistent death rate would mean industrial ostracism, a speedy reduction would soon be apparent. Mr. Chilton said that in order to overcome the objection in regard to his comparison of the Transvaal mines with coal mines he had ascertained the figures of the accident rate in metal mines in other parts of the world where conditions were similar. The figures were :—

	1907 p.c.	1908 p.c.	1909 p.c.
Gold Coast … … … …	2.75	2.66	3.71
British Guinea … … …	0.26	0.69	0.86
India … … … … …	1.90	1.50	1.42
Ceylon … … … … …	0.33	0.24	0.11
Mexico … … … … …	5.18	4.64	5.78
Cape Colony … … …	2.29	2.35	1.25
Egypt … … … … …	1.36	2	3.08
Orange Free State … …	2.00	1.56	1.12
Kimberley … … … …	3.17	2.19	1.63
Rhodesia … … … …	3.96	4.28	4.92
Malay States … … … …	1.00	0.74	0.90
Peru … … … … …	3.10	2.31	2.70
Portuguese East Africa …	3. 0	2.02	1.03
Transvaal … … … …	4.71	4.18	5.18

The figures showed that our position was a discreditable one. The talk about "safe" mines and "difficult" mines was absurd. A mine was safe in proportion to the vigilance of the mine officials. The Belgian mines, which were admittedly the most dangerous in the world, had an accident rate which, for the three years ended 1909, averaged 1.01 per 1,000.

GOVERNMENT OFFICIAL'S FIGURES.

In dealing with the criticisms of Mr. Kotze (the Government Mining Engineer), Mr. Chilton said that gentleman had got mixed in his figures; he was confusing the ordinary accident rate with the accident death rate. The official figures for accidents in the Transvaal mines were :—

	Per 1,000 workmen.	No. of accidents.
1908 … … … .. … … …	8.45	1,620
1909 … … … … … … …	9.15	1,883
1910 … … … … … … …	10.23	2,183

There was an apparent reduction in 1911, the figure given being 3.76. This was more apparent than real, and had only been brought about by new methods of tabulation and not by any increase in the safety factor. The new method had been introduced to secure uniformity, but he thought that a uniformity which was secured by adopting a less correct mode of tabulation was a uniformity that was not desirable, for it checked the stream of reform. Of the 38 countries and districts for which Mr. Kotze had given figures only four—British Columbia, Mexico, Alabama and West Virginia—were our rivals in this competition. The contention of the Government Mining Engineer that the best-run mines on the Rand had the lowest accident rate had been borne out; dividends went hand-in hand with a low accident rate. He (Mr. Chilton) was certain that if the 44 "abattoir" mines dividend list was put alongside the list of the "safe" mines, the result would cause some hard thoughts and probably not a few changes. He agreed with Mr. Kotze that "efficiency and safety on a mine march together." The second portion of the reply will be read at the next meeting of the Society. Some other technical papers were read and discussed at Saturday's meeting.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings, Box 2061, Johannesburg.

A SYSTEM OF KEEPING UNDERGROUND COSTS AND RECORDS.

The Importance of Proper Records—Sweeping Criticism of Average Mine Methods—Cost Keeping at the Ferreira.

[By G. Hildick Smith, B.Sc.]

At the last meeting of the Chemical, Metallurgical and Mining Society of South Africa, Mr. J. Hildick Smith, B.Sc., read a paper of which all but the forms and tickets referred to is reprinted below. The paper contains without doubt a severe criticism of methods of cost keeping in common use on the Rand, and should for once rouse mine managers to the point of discussion of what is unquestionably a most important subject:—

From an economical standpoint and in order to obtain the highest efficiency and best results underground, on any mine, it is obvious that the official in charge of the underground department should know exactly what it is costing, in detail, to do all the various classes of work necessary in this department. In order that underground costs may be kept in such a way that they may be of actual practical use, the ruling prices of stores and material required, the cost of labour, the cost of upkeep, for example, of the various types of machine drills, together with their air-consumption, must be known. The figures relating to such items as these must be recorded in as simple and concise a manner as possible. Unless this is so the underground supervising staffs of the mines, cannot be working on the most economical lines, unless by accident. At present, practically no thought is taken by underground officials of the cost of the material used by them. Matters such as these are left to the storekeepers or mechanical engineers. It is now high time that a different state of affairs became the rule. Under the existing conditions it is practically impossible for any accurate estimate to be formed of the cost of doing any piece of work necessary underground, and it is, therefore, also impossible to choose the cheapest and best method of doing the work. To improve matters in this respect the author has introduced the following system at the Ferreira Gold Mine by which it is impossible to keep in touch with the cost of all work going on underground, by means of tabulated cost sheets and graphic records. The idea of the system evolved is to give in sufficient detail, particulars, in regard to underground work solely, which are of actual practical use to the head of the underground department. At present the comparative statistics as published by the various mining groups for the edification of their consulting engineers, managers and others, are of very little, if any, use to the underground officials, as from such comparative statistics only more or less worthless comparisons may be made between the costs of the same classes of work at the various mines, as the costs are given in too general a form. For example, the hand-stoping costs for any mine show that for the total tonnage broken by hand throughout the mine, the cost on an average was 5s. per ton broken, from this it is impossible to see whether good or bad work was being done in any one stope. The same applies to all other classes of work underground to which only rule of thumb methods are at present applied, and often the results depend purely on guess work. The results of the introduction of some such system as is here described would be:—

(1) *Improved underground supervision*—The old style of "hustle" will be gradually replaced by more thoughtful work by shift bosses, mine captains and underground managers.

(2) *A more settled condition of the underground white labour force*—Men could be judged from the actual results of their work, and not by the fact that they may be found at any moment apparently doing nothing.

(3) *A maximum of safety and economy* in all underground work.

(4) *A reduction in the accident rate* by the keeping of accident statistics for each shift boss' section, and by the introduction of a bonus scheme, the bonus to be paid to the shift boss obtaining best results, thus encouraging shift bosses to use more care and thought in the prevention of accidents.

(5) *A gradual improvement in the class of miner* on this field.

(6) *The further introduction of well-trained men on the underground supervising staffs* on the mines.

(7) *The speedy eradication of the phthisis evil* by the decrease in the "hustle" evil and the improvement in the general system and supervision of the work underground.

These are some of the results which would undoubtedly be obtained eventually by the general introduction on the mines, of a system of keeping in detail, figures relating to all underground work, its costs, the efficiency obtained and the accidents that occur.

The system in vogue at the Ferreira Gold Mine. Method of obtaining cost of Stores.—In order to arrive at the cost of any detail of the underground work, quickly and simply, all orders for stores, such as gelatine, candles, fuse, timber, or what not, are made out in duplicate, one copy being filed in the office of the underground manager, the other copy for which the stores ordered are issued, being taken to the store. As the shift bosses know best whether or not their men really require certain stores, and as the costs for their sections are an important part of the system here described, all orders, for the usual class of stores required, are issued by each shift boss to his own men. This is an important point, as by this means only is it possible to effect the strictest economy—this cannot be the case when the detailed ordering of stores is done for example by mine captains who are not so closely in touch with the men as are the shift bosses. By the ordering of stores in duplicate any alteration of the order form by unscrupulous miners can be at once detected. The general ordering of such materials as timber, rails, sleepers and pipes is done by the head of the underground department. On the other hand forms as issued by shift bosses are written the miner's name, the stores required, and the class of work for which they are to be used. The duplicate orders are filed in the office in alphabetical order of the names of the miners for whom they are made out. Thus it is a simple matter to obtain the cost or quality of stores used by any miner over any period.

White and Native Labour Costs.—Particulars as to the cost of white labour are obtained from the white time office. The shift bosses see that under "Details of Work," on the White Time Ticket, the correct heading is given. This is done before the shift boss countersigns each of his own men's tickets as correct. Each employee places opposite the words "No. of natives employed," the number of natives he has working with him during the shift. Particulars as to the cost of native labour for each class of work are then arrived at by taking the number of native shifts from the white time ticket and allowing an average rate per shift. This gives a cost for native labour near enough for the purpose required. An exact figure can be obtained from the native time office when necessary, otherwise all native time on the same class of work all over the mine is placed under one head and cannot with ease be obtained for each working place.

Cost of the various Classes of Work.—In order therefore to obtain the actual cost of, breaking ground in any stope, reclaiming an old drift, robbing pillars, or what not, the costs of the following items have first to be determined:—(1) Drills, drill sharpening, and drill distribution; (2) Machine drill costs (a) upkeep, (b) air-consumption, (c) spares, and (d) depreciation; (3) Pipes and pipe fitting; (4) Track-laying; (5) Trucks and truck repairs; (6) Tramming; (7) Timbering; (8) Stone-walling; (9) Sundries, e.g., saw sharpening, assaying and sanitation. Such items as the cost of pumping, ventilation and hoisting can be kept as special accounts.

(1) *Drills, Drill-sharpening and Drill-distribution.*—All drills are stamped with a number and each miner has drills stamped with his given number. The first cost of all new drills issued to each miner and the cost of sharpening any class of drill is obtained from the mechanical engineering department. The white employee in charge of the drill-distribution, gives in the number of drills issued to each miner per shift, and from this the cost of drill-sharpening, for each stope or other working place, is easily arrived at and to this cost is added, in proportion, the cost of labour for drill-distribution.

(2) *Machine Drill Costs.*—The cost of running machine-drills consist of:—(a) Upkeep; (b) Air-consumption; (c) Depreciation; (d) Spares issued to miners; (e) Rigging gear, arms, bars and clamps. All machine drills are stamped with a number, the numbers of machines issued to each miner are known, all spares and rigging gear required by the miner are ordered by the shift bosses, so that the cost of the same can be arrived at at the end of each month. The air consumption for each type of machine is taken by a Kent and Sons' Manometer, and an average figure arrived at for each type, then by allowing an average drilling time, the air consumption per machine per shift is obtained. The cost of upkeep of the machine drills, that is the actual cost of the machine-fitting and repairing done in the fitting shops, is kept on a chart, from which may be seen at a glance the time during which any machine is on the surface, the repairs done to the machine while it was at the surface, and the cost of same. Separate charts are kept for the reciprocating and hammer types of machine drills. At the end of the month an average cost for repairs per machine per shift is then an easy figure to arrive at—the number of machine shifts being kept in a special book for that purpose, in which the machine shifts are entered up by shift bosses.

(3) *Pipes and Pipe-fitting.*—Pipe-fitters and pipe-fitters' native labour costs are obtained in the usual way, the same applies to all pipes and pipe-fittings ordered. The total cost of pipe-fitting being apportioned over all sections of the mine.

(4 and 5) *Track-laying Trucks and Truck-repairing costs* are also obtained in the same way and apportioned over all sections of the mine.

(6) *Tramming.*—Tramming costs are worked out to give a cost figure per foot-ton trammed, a distance trammed being obtained from the survey department, and the tonnage from the truck and tally book. The tramming efficiency and cost of tramming may then be worked out separately for any one working place as required. The system of keeping and checking the tally tonnages throughout the mine is described under the heading of "Truck Tally System.

(7) *Timbering.*—All timber required by miners for use in stopes and drives is ordered, in duplicate, by the shift bosses. On the order is stated the level to which the timber is to be delivered, and the name of the miner requiring the timber. Thus the cost of timbering

each working place can then be easily obtained. The stock of timber in the timber-yard is taken at the end of each month, when a check on all timber used is made by taking into consideration the quantity of new timber delivered at the mine during the month and the quantity sent underground. As a further check the banksmen at each shaft record the number of lagging sent underground.

(8) *Stone-walling.*—The tonnage of either reef of waste packed in any stope or working place is obtained from figures kept in the survey office, the cost of this work per ton packed or per ton broken is calculated and allowed for either for each stope or over the whole mine.

(9) *Sundries.*—These include such items as sanitation, saw-sharpening and assaying, for some of these items, such as sanitation, a separate account is kept, in other cases where the item is a small one it is charged under the heading of "Sundries" to other accounts. In the same manner the running cost of pumping, ventilating and other plant in use underground can be obtained as required.

Shaft Repair Records.—A cross-section to scale of each shaft is kept on which the class of timbering, or what not, in any one section is shown with notes as to its condition. As repairs and renewals of timber, rollers and rails in the shafts are made, they are noted on the chart with the dates on which the work was done. The condition of the shafts throughout can then be seen at a glance. Note is also made of points where repairs are required. A summary of the work done and its cost is recorded for each month in tabulated form, on a sheet attached to the cross-section.

Truck Tally System.—In order that the costs for each shift boss' section may be compared month by month, it is necessary to have as good a method as possible of obtaining the correct tonnage trammed from each working place during the month. The shift bosses must in the first place be made responsible for the correct tallying of all the broken ore trammed from their sections. All tally tickets are initialled by the shift boss of the section to which they refer. The shift bosses' sections are numbered 1, 2, 3 and so on, the section number being stamped on the ticket. The number of trucks trammed is entered in the truck tally book in column form, a separate column being alloted to each working place. As mistakes, intentional or otherwise, are always possible in dealing with truck-tally figures, it is necessary that a check should be made on the tallying for each level—the skip tonnages hoisted from each level are, therefore, taken. These are obtained correctly by measurement in trucks, each holding one ton of broken ore, into which all the ore hoisted passes before being tipped into the grizzlies. The tonnage figures thus obtained are plotted on the level tonnage chart. From these are compiled charts showing the tonnage hoisted at each shaft for each day, a summary of the whole is shown on the "Gross Total Tons Hoisted." The tonnage charts for each month are finally pasted together, and the rise or fall in the tonnage mined over any period may then be clearly seen. The result is that the underground tallying is checked, the proper filling of the skips by skipmen can also be checked as the number of skips hoisted from each level is also recorded in a book kept for that purpose at each shaft. The best work in hoisting and tramming generally is thus encouraged.

Shift Boss Sectional Costs.—By a system such as described it is a simple matter to obtain the cost and efficiency of all work done in any one section of the mine, and this, in the author's opinion, is most important, as by keeping figures showing what tonnage has been mined, tonnage per boy shift, cost of timber used, total cost per ton mined for each shift bosses' section, the results are that shift bosses become trained to look upon their work in a new light—a greater interest is taken by them in their work, and by the adoption of a bonus scheme, a bonus being paid to shift bosses on the results of the month's work in their respective sections, the best work is further encouraged. In this way good or bad work by different men can be at once detected. The unsettled condition of the underground white labour force on the Rand would be improved upon by taking into account the number of dismissals of workmen by each shift boss or mine captain, if figures relating to this for each section were continually kept provided, that those in authority were really desirous of improving on the present unsettled state of affairs in this respect.

Conclusion.—To-day, any figures relating to the cost of the various classes of work, such as cutting shaft-stations, pump chambers, re-timbering shafts, or what not, are conspicuous by their absence. This being so, it is impossible either to estimate the cost of doing any such class of work or to know the cheapest and best method of doing it. The same applies to the cost of breaking ground in the various stopes of a mine, where in order to obtain the best results, the cheapest methods of breaking ground and supporting the hanging wall under the existing conditions should be known. In order that this may be the case, such tables, for example, as those relating to machine and hand stoping respectively must necessarily be kept. The same applies to development, reclaiming and other work. By means of the system described the cost of any piece of work underground can be arrived at and all costs, as they should be, are ready to hand for the edification of those in control of the underground department. The advantages thus gained by some method such as described, over the at present too common methods of guessing the best and cheapest way of doing any undergraund work, are obvious. New methods of working can be experimented with figures showing the exact results obtained being properly recorded, the best methods of working can then be chosen with certainty. The greatest scope for improvement on the mines of the Rand is in the underground departments, but no improvement can be made unless it is first known what results are actually being obtained. At present in respect to the underground work, the results obtained in detail, with regard to costs and efficiency, are unknown. It is noticeable that a change is taking place in respect to underground supervision on the Rand. The personnel of the underground staffs of the mines is undergoing a change, technically trained men, who have had the necessary practical experience, are replacing the purely practical men. The time for the adoption of some such system as described, has certainly arrived, and a system of keeping complete and detailed underground costs should be standardised by each of the mining groups. If only half the clerical work, at present being done on the compilation of head office returns for the various groups, was done in keeping in detail figures and returns relating to the underground work only, money which is to-day being wasted on underground work would be saved, and in addition health or other conditions underground would be improved upon. Work below the surface is being carried on in the dark in every way, and it is time that those responsible for the work going on in the underground departments of the mines of the Rand adopted new methods in order to improve on the careless work, which is too commonly done. The author hopes that this paper will be fully discussed by many of the mining members in order that the best method of keeping figures relating to underground work may be devised and generally adopted.

Ferreira Deep.

The profit for the quarter showed a decrease of £5,508 below that of the previous one. During November several of the richer stopes were temporarily rendered unavailable on account of caving; these were not entirely recovered until February, consequently the tonnages crushed were considerably reduced, especially in January, and the profits materially reduced thereby. During March there was a return to more normal conditions underground, and the profit rose to £37,612, the best for the past six months, and a figure which was only exceeded once during 1911. With the nearing completion of the large sands-filling programme and with the present increased native labour force, it is expected that the profits will now continue more normal. The sinking of No. 1 shaft was continued during the quarter, 115 feet being accomplished, and a start will, it is hoped, shortly be made with the re-sinking of No. 2 shaft to the boundary. The development footage shows an improvement of 899 feet for the three months, and the values of reef exposures were maintained. A start has been made with driving the 12th level from No. 1 incline, and as this level will be the lowest to be reached by No. 2 incline, it is intended to make a more permanent level than those above it, so that the lower portions of the mine may have permanent access to both shafts. The amount still to be spent on capital account amounts to £7,566, and the only further expenditure contemplated in the near future is about £4,000 for providing brakes for the hoisting engines in anticipation of their electrification, improvements to the pulp classification, and underground pumping plant. The original large scheme of sands-filling on both reefs right across the property is nearing completion, and the last remaining area on the South Reef between the two shafts is now being filled, but necessarily at a slower rate than in the near past; certain other smaller areas will in all probability be filled, but not on the same wholesale sale as previously.

Klipwal Restarts Crushing.

In April this mine crushed 320 tons for 200 ounces with five stamps of 750 lbs. The crushing time was 384 hours in the month.

CYANIDE of SODIUM, 120 %
ZINC DUST, SHEETS and SHAVINGS.
MABOR FUSION CUPELS and MATERIAL.
3 STAR CRUCIBLES and CRUCIBLE BARS.
3 STAR LITHARGE.
HARDWOOD MINING POLES and SAWING TIMBER.
"BRUNSVIGA" Calculating Machines.

RICHARD HEYMANN & CO.,
73/5, Exploration Buildings
P.O. Box 2425.
Telephone 351.
Telegrams: "Extra."

MINING IN MOZAMBIQUE COMPANY'S TERRITORY.—II.

Official Description of Mineral Prospects in a Promising Field—Facilities Offered to Prospectors.

The following is a short account of the terms under which claims may be pegged and held within the territory of the Mozambique Company :—The whole territory is open to prospecting with the exception of Beira, Neves Ferreira, Buzi and Mossurize, which districts are at present closed to prospecting for precious stones, combustible minerals and mineral oils, though open in respect of all other minerals and all metals. *Prospecting* : A licence for prospecting, known as a Mining licence, confers the right to prospect, not only on public land, but also on private farms, but prospecting is not allowed within 200 metres (218 yards) of occupied houses or buildings, nor on kitchen gardens or gardens, nor within townships, etc. Anyone may, on application, obtain as many mining licences as desired. A mining licence can be obtained at the Mines Department, Macequece, in Manica, or in other districts at the Commandant's Office on payment of £1 sterling. The licence is valid for 12 months and for the whole of the territory that is open to prospecting. Each mining licence gives the right to peg off (a) one group of ten claims of mineral substances of the first class, which class includes reefs and lodes of metals and metallic minerals : each claim is 100 metres square (107,641 square feet ; or (b) one group of ten claims of substances of the second class viz. : alluvials : the size of these claims is the same as that of claims of deposits of the first class ; or (c) one claim of substances of the third class, viz., deposits of graphite, anthracite, coal, lignite, mica, asbestos, etc. Each of these claims is 1,000 by 500 metres (3,281 feet long, by 1,640 feet wide). *Inspection Certificates.*—The group of claims, or claim pegged off, must be registered at the Mines Department. Within twelve months from the date of registration the holder must execute on claims of deposits of the first class, which class includes reefs and lodes of metals and metallic minerals two metres (6ft. 7in.) of development work per claim, with a minimum of twenty metres (66 feet) for any number of contiguous claims that may be less than ten. Should he fail to execute such work, he may obtain an Inspection Certificate on payment of 10s. per claim. For each succeeding twelve months he must execute the same amount of development work, or, should he fail to execute such work, obtain an Inspection Certificate by payment. The cost of an Inspection Certificate by payment for deposits of the first class, increases in the second year to £1 per claim, in the third year to £2 per claim, and in the fourth and subsequent years to £3 per claim. Certificates obtained by work bear a stamp of the value of 2,000 reis (about 8s.) per group of ten or less claims in the case of deposits of the first class. There is no Inspection Certificate necessary in the case of deposits of the second class, viz. : Alluvials. For each claim of substances of the third class (deposits of graphite, anthracite, coal, lignite, mica, asbestos, etc.), 150 metres (492 feet) development work must be executed annually, or an Inspection Certificate obtained by payment. For these claims the cost of an Inspection Certificate is, for the first year, £5 per claim ; for the second year, £10 per claim ; for the third year, £20 per claim ; and for the fourth or subsequent years, £30 per claim. Should the holder of a group of claims of substances of the third class, fail to obtain, either by work or by payment, his certificate of inspection in any year within 30 days of the termination of the twelve months to which the certificate refers, the group of claims or claim in question is liable to forfeiture. *Claim Rents.*—These are known as claim licences in Rhodesia and the Transvaal. They are due annually and must be paid in advance, but the first year after registration is free. They are for each claim of substances of the first class, which class includes reefs and lodes of metals and metallic minerals :—For the 1st year (i.e., the 2nd year of registration, 2.250 Rs. or 10s. per claim ; for the 2nd year (i.e., the 3rd year of registration), 3.375 Rs. or 15s. per claim ; for the 3rd year (i.e., the 4th year of registration), 4.500 Rs. or £1 per claim ; for the 4th year (i.e., the 5th year of registration), 6.750 Rs. or £1 10s. per claim ; for the 5th year (i.e., the 6th year of registration), 9.000 Rs. or £2 per claim ; for the 6th year (i.e., the 7th year of registration) and all subsequent years, 13.500 Rs. or £3 per claim. The rents for claims of substances of the second class, viz. : Alluvials, are 6.750 Rs., or £1 10s. per claim per year as from the anniversary of registration. These rents do not increase. The rents for claims of substances of the third class (deposits of graphite, anthracite, coal, lignite, mica, asbestos, etc.) are : —For the 1st year (i.e., the 2nd year of registration), 25,00 Rs. or £5 11s. per claim ; for the 2nd year (i.e., the 3rd year of registration), 50.000 Rs. or £11 12s. per claim ; for the 3rd year (i.e., the 4th year of registration), 100,000 Rs. or £22 4s. per claim ; for the 4th year (i.e., the 5th year of registration) and following years, 250,000 Rs. or £55 11s. per claim. It will be seen that the rents on gold reef claims compare very favourably in amount with those of neighbouring countries, the Transvaal prospector's licence being 5s. per claim per month or £3 a year from the beginning, and the digger's licence, £1 per claim per month or £12 a year, while in Rhodesia, though claim licences are not payable until crushing commences, they are then 10s. per claim per month or £6 a year for every claim which is being worked for profit, with a reduction to 5s. per claim per month for any month in which no ore shall have been extracted from the claim in question, or when the monthly output of the block of claims does not exceed £100 in value. *Royalties.*—The royalties on the production or output of claims due to the Mozambique Company are as follows :—(1) In the case of gold and the secondary products of gold, including silver ; (a) If the gross monthly production be less than 800 ounces fine gold ; when the monthly production does not exceed 200 ounces fine gold, 1 per cent. ; when the monthly production exceeds 200 ounces but does not exceed 400 ounces fine gold, 2 per cent. ; when the monthly production exceeds 400 ounces but does not exceed 600 ounces fine gold, 3 per cent. ; when the monthly production exceeds 600 ounces but does not exceed 800 ounces fine gold, 4 per cent. ; (b) If the gross monthly production exceeds 800 ounces fine gold. 10 per cent. of the net profits. : (2) In the case of any other mineral substances of the first, second, or third classes, 10 per cent. of the net profits. The Company of Mozambique demands no shares or participation in any kind of flotations. *Transfers, Options, etc.*—Transfers of mining claims must be effected at the Mines Office at Macequece. A duty of 1 per cent. either in money or in shares, according to the nature of the consideration for which transfer is given, is payable on transfer to the Mozambique Company. Mortgages on claims can be registered at the Mines Department on payment of a fee of 1 per cent., such fee not to be less than £1 or more than £20. Options can also be registered at the Mines Office for the same fee and in the same manner as mortgages. Other contracts relating to claims are admissable to registration under the same conditions as a mortgage contract, the fee for such registration being £1. *Mining and Water Regulations, etc.*—The Mining Regulations, the Water Regulations, and any Regulations or Instructions in force concerning mining are obtainable within the territory of the Mozambique Company, in Beira at the Company's Offices, and in Macequece at the Mines Department : in London, at the Mozambique Company's Offices, 13, Austin Friars, E.C. : in Johannesburg, at the Oceana Company's Offices in Simmonds Street, or at the Central News Agency, Commissioner Street : in Rhodesia, in Umtali, at the Umtali Printing and Publishing Company, and in Bulawayo at the Argus Printing Company, Limited

Tanganyika Concessions.

The report of the Tanganyika Concessions shows that the latest smelting at Katanga with European coke cost £41 10s. per ton at the works; with Wankie coke, £26; with partly Wankie coke, £30. The report states that with improved arrangements for washing copper can be landed in the European market at a little over £30 per ton.

Aliwal North makes the Orange River drive its pumping and electric lighting machinery, and now (says a contemporary) it is proposed that the river should also assist in the generation of power for commercial purposes. Several tradesmen have offered to take current. It is intended to run a creamery, cold storage and other similar undertakings.

Katanga Developments.

The report of the Rhodesia-Katanga Railway Company shows a balance for the year of £63,074. Prospecting for diamonds has hitherto produced only a few small stones.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

THE WITWATERSRAND NATIVE LABOUR ASSOCIATION REPORT.

Views of the Board of Management—Labour Problems—The Year Reviewed.

The following extracts are taken from the Witwatersrand Native Labour Association, Ltd., annual report, presented to the members at the tenth ordinary general meeting, held in the Council Chamber of the Transvaal Chamber of Mines, on Thursday, the 25th April, 1912:—

Recruiting.—The number of natives recruited by the Association and its members during the year was 208,858, from the following sources:—

	Recruited by W.N.L.A.		Recruited by Mines.	
1. BRITISH.				
Transvaal Province	1,464		8,226	
Swaziland	—		3,237	
Bechuanaland	—		1,123	
Cape of Good Hope Province	719		46,988	
Basutoland and O.F.S.	—		9,759	
Natal Province and Zululand	—		10,088	
Rhodesia	—		943	
British Nyasaland Protectorate	1,059		—	
British Nyasaland Protectorate (recruited in Portuguese areas)	922		—	
		4,164		80,364
2. PORTUGUESE.				
Province of Mozambique:				
Inhambane, Gazaland and Lourenco Marques	40 894		—	
Quilimane district	2.143		—	
Tete district	1,678		—	
Mozambique district	6 715		—	
Portuguese Nyassa	2,676		—	
Beira and Chinde	1		—	
		54,107	—	—
3. ENGAGED LOCALLY ...		70,223	—	—
		128.494		80 364
		Total 208,858		

Of the 70.223 natives described as engaged locally, 35,181 were registered as new arrivals from their homes, being natives who had made their own way here. The remaining 35,042 were transfers from one employer to another. The arrangement by which the Association confines its operations principally to territories outside the Union has been continued. Within the Union recruiting is mainly carried on by the separate organisations maintained by mines and groups. The details of the total number of natives received and distributed from the commencement of operations in 1901 to the 31st December. 1911, show a total of 1,287,510 received, of whom 1,266,058 were distributed to the mines. The balance includes those who were rejected on medical or other grounds, deaths and desertions, and those who were detained pending allotment at the end of the year.

Accounts.—The registered capital of the Association at the date of the last annual report was 38.906 shares, exclusive of 580 shares belonging to the Barberton branch. A further 16.722 shares (including 10 shares of the Barberton branch) had been subscribed for but not registered. Since then, 4.718 shares have been taken up, and all shares were registered at 31st December, 1911. The position of the capital account (exclusive of the shares held by the Barberton members) at the 31st December last, was as follows: 60,336 shares of £1 each, upon which 12s. per share has been called up, £36.201 12s.; upon these shares a deposit of 25s. per share has been made, £75 420; total, £111.621 12s. The amount of uncalled capital is 8s. per share, representing a sum of £21,134 8s. The position of the capital account in respect of the Barberton shares is as follows: 590 shares of £1 each, upon which 2s. per share has been called up, £59; upon these shares a deposit of 25s. per share has been made, £737 10s.; total, £796 10s. The amount of uncalled capital on these Barberton shares is 18s. per share, representing a sum of £531. The sum of £777 appears in the balance sheet under the head of "shares surrendered," and has been explained in a previous report. During the year under review the special shares, representing the original shares in the Chamber of Mines Labour Importation Agency, Ltd., have been cancelled, and the sum of £47,591 14s., being 6s. paid up on 158,649 special shares, has been paid out to the shareholders. The statement of revenue and expenditure laid before you deals with the period 1st January, 1911, to 31st December, 1911. The total revenue for that period was £354,343 6s. 5d.; and the total expenditure (including depreciation to the amount of £3,906 16s. 5d.) was £291.352 5s.; being a balance of revenue over expenditure of £59,991 1s. 5d. To this must be added £9,297 4s. 7d. on account of interest, and £1.584 10s. 5d., profit on the sale of £30,000 worth of Johannesburg Municipal Stock, making a total of £70,872 16s. 5d. The board, under article 15 of the articles of association, decided to make a refund of 20 per cent. on the capitation fees paid for natives during 1911, which absorbed the surplus of £70,872 16s. 5d. The cash in hand and on deposit, with interest accrued to the 31st December, amounted at that date to £199.603 6s. 10d.; investments amounted, at cost price, to £88,682 19s. 1d.; and other cash assets amounted to £69.693 5s. 4d.

Wastage.—The usual statistical table is attached, from which it will be seen that, whereas in 1910 there was a net increase of 22.375 natives registered to members of the Association, 1911 shows a decrease of 4,960. This was due mainly to the fact that the influx of labour which usually takes place during the last two months of the year was delayed.

Native Labour Regulations.—During the year under review, the Association had under consideration the proposed Native Labour Regulations, which came into force on the 1st January last. Various recommendations were made by the Association in connection with these regulations, some of which were accepted by the Government and embodied in the regulations as published.

Compounds and Buildings.—Since the last annual report, the Association has erected additional compound buildings at Ressano Garcia, including an additional hospital, with the result that the work of passing natives through that compound and their medical examination has been facilitated. The Association has also determined on the erection of a new compound at Lourenco Marques. The necessary ground has been secured, the consent of the Government to the erection of the new compound has been obtained, and the building of the compound itself will be proceeded with shortly.

Health of Natives.—The total mortality during the year among natives employed by members of the Association was 34 per thousand per annum, as against 35·7 per thousand per annum in the preceding year. Early in 1911 your Board decided to vote some £40,000 to the erection of a laboratory for bacteriological research, primarily for the purpose of investigating pneumonia which, in the past, has been responsible for a large percentage of the mortality among the natives working on these fields. The Government was approached in the matter, and it was finally agreed that, provided the Association would find the money for the building up to £40 000, the Government would provide the site. The Association also agreed to contribute to the upkeep of the Institute on the pound-for-pound basis up to £5 000 per annum. The Government has promised a site on Hospital Hill, close to the old Police Barracks and opposite the Johannesburg Hospital, and the building of the institute will be started at an early date. After the termination of the engagement of Dr. Mitchell, who had been carrying on research work, with a view to the discovery of a suitable vaccine for the treatment and prevention of pneumonia among natives (referred to in the last annual report), your Board determined to obtain the services of an eminent bacteriologist. For this purpose, Sir Almroth Wright, and a staff of capable assistants, was engaged for a period of six months. Sir Almroth Wright arrived on the Rand early in October and started immediately on his work. He was busily engaged until the end of February, when he returned to England, leaving his work to be continued by Drs. Parry Morgan and Dodgson, two of his assistants, whom your Board arranged should continue the investigations inaugurated by Sir Almroth. Up to the end of December, 1911, some £7,600 was spent in this research work. It is still too early to give any exact forecast as to the result of these investigations, but, from preliminary information received verbally from Sir Almroth, your Board is of opinion that satisfactory results may be expected.

Recruiting on the East Coast.—During 1911, 40,894 natives were recruited in Portuguese areas south of latitude 22° S. This, in itself, is a satisfactory figure, though falling short of the 44 684 natives recruited in 1910. Of the natives recruited during 1911, 27,650, or say 67 per cent., had previously worked on the mines. In August last a Committee of the Board was appointed to travel through the East Coast and report on the recruiting conditions of the Association in those areas. Messrs. Frames and Jeppe made the journey on behalf of the Board, and Mr. S. M. Pritchard, the Director of the Government Native Labour Bureau, joined the committee as a Government representative. On their return, the committee reported that the condition of native recruiting in that area was in every way satisfactory.

Tropical Areas.—Recruiting in tropical areas, north of latitude 22° S., has continued, as in previous years, with the exception that, as foreshadowed last year, operations in Portuguese Nyassaland have been carried out this season by the Nyassa Consolidated Company, acting under arrangements with the Association. The health of tropical natives has continued to occupy the close attention of your Board, with the result that, while the death-rate for the first seven months of the year was at the rate of 77·26 per thousand per annum, it dropped to 49·49 per thousand per annum for the last five months of the year. The figures for January and February, 1912, showed a further drop to 48·00 and 38·97 respectively.

TRANSVAAL CHAMBER OF MINES' MONTHLY REPORT.

Important Questions Dealt With by the Executive.

At the monthly meeting of the Transvaal Chamber of Mines held on Thursday the Executive Committee presented a report containing the following among other matters :—The returns supplied by the Witwatersrand Native Labour Association, Limited, show the following results for the month of April :—Number of natives employed by members of the Association on last day of month (including natives in the service of mine contractors, but excluding natives in the employ of members of the Association in the districts of Barberton, Breyton, Rooiberg, and Louis Moore) :—

	March.	April.
On gold mines	196,748	197,937
On coal mines	8,198	8,364
On diamond mines	12,071	13,785
	217,017	220,086

Recruiting Results.—The Witwatersrand Native Labour Association also furnishes the following information with regard to the natives recruited by the Association and its members during the month of April, 1912, and the districts whence they were obtained. These figures do not include natives recruited by mine contractors. The corresponding figures for the month of March are given for the purpose of comparison :—

Source.	March.	April.
East Coast—South of latitude 22 degs. S. ...	5,190	2,789
East Coast—North of latitude 22 degs. S ...	3,213	—
Cape Province	3,230	3,404
Transvaal Province	1,073	877
Basutoland and Orange Free State Province	1,194	1,336
Bechuanaland	279	411
Natal Province	461	421
Swaziland	154	135
Rhodesia (including via Pietersburg)	253	201
Local	10,294	8,642
	25,341	18,216

The monthly report issued by the Department of Native Affairs shows that at March 31, 1912, 323,463 natives were employed in labour districts of the Transvaal. Of this number, 230,277 were engaged on mines and on various classes of works specified in Part I. of the Coloured Labourers' Health Regulations, 1906, and 93,186 were in other employ.

Illicit Liquor Traffic.—A Sub-Committee of the Chamber had an interview with the Deputy Commissioner of Police, at which the questions of illicit trade in liquor, control of the native married quarters, and general policing of the mining area, were discussed. It is hoped that, as a result of the interview, improvements will be affected, particularly in the better control of the illicit sale of liquor in the neighbourhood of native compounds and native married quarters. Your Chamber has nominated Mr. S. C. Black as its representative on a Joint Committee of the Municipal Council of Johannesburg, the Johannesburg Chamber of Commerce and this Chamber, for the purpose of collecting and preparing evidence in regard to the working of the native pass laws.

Miners' Phthisis Bill.—The above-named Bill was referred to the Select Committee of the House of Assembly, and representatives of the Chamber were requested to give evidence before the Committee. Several preliminary representations had been previously made to the Government by your Executive Committee on certain aspects of the Bill. As the result of the Select Committee's request, Messrs. R. W. Schumacher, E. J. Way and R. A. Berry gave evidence in Capetown before the Select Committee.

Death Duties Bill.—Since the date of the last monthly report an amendment has been introduced by the Minister of the Interior to the clause in the Taxation Resolutions imposing a fixed duty, by which amendment, in those cases where (a) the stock of a company is issued to bearer upon which any interest or dividend or bonus is paid, or (b) if such stock is registered in the name of a company or body incorporated or registered outside the Union, then in lieu of the fixed duty of five per cent. a special compensation duty of one-quarter per cent. per annum is introduced in respect of the market value of the stock effected. Your Executive Committee has made urgent representations to the Government that taxation of this nature is inimical to the best interests of the State and tends to discourage the investment of foreign capital in the Union.

Roads Ordinance.—It will be remembered that the Chamber forwarded to the Administrator of the Transvaal, on January 27 last, a memorandum of the Draft Roads Ordinance, published in the Provincial "Gazette" of September 15, 1911. Last month, as the Chamber had not received any reply to the above memorandum, enquiry was made of the Administrator as to whether he would grant representatives of the Chamber an interview in order that they might make personal representations on the matter contained in the memorandum. On May 14, the Administrator and the Executive Committee of the Provincial Council received the representatives of the Chamber, the president, Mr. H. O'K. Webber, and the legal adviser. The deputation received a sympathetic hearing, and the suggestions which had been made by the Chamber were thoroughly ventilated.

Pilgrims Creek G.M. Co.

This company now has the reef in four different drives, and on the commencement of its crushing operations, which they expect to be about July, it is anticipated that the company will become a steady producer.

It is the intention of His Excellency the Governor-General to proclaim at an early date as alluvial diamond diggings, in pursuance of Section 15 of the Precious Stones Ordinance, 1903, of the Transvaal (No. 66 of 1903), portions of the farms Boschpan No. 155 and Panfontein No. 121, both in the district of Bloemhof, mining district of Klerksdorp, in extent respectively 114 morgen 206 square roods and 346 morgen 365 square roods, registered in the name of the African Farms, Ltd.

A MEDICAL VIEW OF PHTHISIS.

The Root of the Evil—Prevention of Dust, Ventilation and Disinfection.

DR. GEM, Medical Officer of Health for Krugersdorp, in his annual report, deals as follows with the question of phthisis and miners' phthisis:—I have to repeat my former statements, and to draw attention to the enormous ravages of these fell complaints. The Government has at last taken this matter up to a slight extent only, by appointing a Commission and a Board of Examination for compensating miners who are afflicted with phthisis and miners' phthisis. As regards miners' phthisis, the question arises—What earthly use is there in compensating men who are morally dead, and letting the root of the evil remain in abeyance? You ask, What is the great evil? Non-destruction and disinfection of sputa, both from those suffering from pneumonia and phthisis, ill-ventilation of underground mines, the want of underground mine sanitation and prevention of dust. Prevention is as follows: After each shift the hose should play on the fine dust in the mine. Let anyone examine the nasal fossae of a miner after he has been down for one or two hours, and he will get a plug of dust mingled with nasal secretion large enough to fill a half-inch pipe, and yet the miner is told to breathe through his nose. How can he possibly do so if blocked as above? What is the natural sequence? He breathes through his mouth and inhales all the fine dust into his lungs, with its mechanical result—miners' phthisis. Inhalers are worse than useless underground, as they become choked by the dust, and the miners simply poison themselves with their own carbonic acid.

The question of the communicability of both pneumonia and phthisis is a moot point. The bacilli of both commingle with the dust underground, and through the agency of the various currents of air are carried to and inhaled by the miner. I look on communicability and catarrhal pneumonia as two of the greatest causes of phthisis on the Rand. If a man expectorates in a train he is hauled up before the magistrate and fined, for fear his sputum may affect someone; and yet take the enormous amount of sputa that has been expectorated down the mines along the Reef, and nothing is done to eradicate such perilous stuff. Does this not affect both white and black miners? Forsooth, one need not ask the question. When I say miner, I mean miner, not a gentleman who does three months' work and then takes a symposium of equal duration. These gentlemen I have no time for.

Pneumonia.—The records of deaths from this complaint are ghastly and lamentable in the extreme as regards the natives. Until due care is taken in recruiting boys, more especially from the East Coast and Central Africa, and boys who are physically deteriorated, so long will our mortality stand at the high figure it does. Pneumonia appears to be more virulent in these boys, or their system less resisttant. Underground mine sanitation as well as medical inspection should have more consideration along the Reef. I consider the sputa of pneumonia in the incipient stages a fertile source of the disease, as the natives are allowed or do work during this stage and expectorate down the mine, which is communicable to other natives working in the same area.

Sanatoria for Tuberculosis.—More of these institutions are required, both for Europeans and natives. The ravages of this terrible complaint are playing havoc with both races. The prevention and cure for consumption in this country is of such paramount importance that the Government ought to view it from a national and economic standpoint. I hope to see phthisis made notifiable in the near future.

Speaking last week at a dinner of the Cape Pharmaceutical Society, Mr. Malan, Minister of Education, referring to the recent deputation of chemists to the Government regarding the metric system, stated that the Metric System Bill would be introduced during the present session.

A sub-office of the Inspector of Mines, Province of the Cape of Good Hope, has been opened at 91 Parliament Street, Capetown, and will deal with all matters relating to boilers, elevators and other machinery. All notices required to be forwarded to the Inspector of Mines under the Mines and Works Regulations, 1911, by owners or users of boilers, elevators and other machinery in the western division of the Cape Province, as hereunder described, must be sent to that address.

INVESTORS' DIARY.

The following company meetings have been announced:—

May 28.—Geldenhuis Deep; Durban Roodepoort Deep
May 29.—Robinson G.M. Co.; New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn; Bantjes Consolidated Mines.
May 30.—Village Deep; City Deep.
June 4.—Ferreira G.M.; Modder B.
June 5.—Rand Mines.
June 7.—General Mining and Finance Corporation.
June 21.—New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.
June 26.—Transvaal Consolidated Lands.
June 28.—A Goerz & Co.
July 19.—Transvaal Consolidated Lands.

Ferreira G.M. Co.

The profit (£47.521) was higher than anticipated owing to the unexpected high tonnage it proved possible to mill; considerable reduction must be looked for in profit for the next quarter. No development work was done and no capital expenditure made.

New Modderfontein.

The circular shaft was deepened a further 224 feet, making its total depth 1,245 feet from the surface. An electric winder has been erected at the 7th level station for sinking No. 12 incline, and sinking operations have been resumed. The tonnage milled was below the capacity of the plant on account of shortage of native labour.

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Rhodesian Section.

LATEST MINING NEWS.

A Breakdown at the Shamva—The Oceola—Exploring, Land and Minerals and the Blue Rock—Selukwe Developments—New Gold Fields Building in Salisbury—The Globe and Phoenix Meeting—Kafue Copper.

DEVELOPMENT at the Shamva is likely to be seriously retarded because of an accident to the air compressor. The rock drills are stated to be held up, and work is now being almost entirely confined to quarrying on the hill top. Another air compressor is being sent to the mine, and will be installed with all speed, so that before many weeks have elapsed the drills should again be in full swing. The development figures for the current quarter, *i.e.*, three months ending June, will of course be influenced by this breakdown, and the total tonnage of ore in reserve at the end of the half-year will therefore be as great as was anticipated. The making of one million bricks for the mine is being pushed on rapidly. The first lot of timber is now on the way, and in a few weeks there will be bustle and activity all around. The railway track is within shouting distance of the mine, and the Kimberley Reefs—Poti River section—is now virtually completed.

* * * *

Reports from the Mazoe district show that this property should be producing in June. The reduction plant consists of a four-stamp (1,250 lbs.) mill and cyanide and slimes plant. Development work has proved 2,000 tons of ore of a value of 1 oz. 7 dwts. rock; the reef, however, is only 12 inches wide, so the return over stoping width will work out approximately £3 per ton. The shaft is sunk to a depth of 114 feet, and at the bottom level some 250 feet of driving along the reef has been done. At the first level about 500 feet of drifting has been run in, also on the reef. Mr. W. Martin Epton, consulting engineer, furnishes the following report on the work done on the property to date: Operations on the mine were started about April 6 last. When the chairman and consulting engineer inspected the workings down to water level, they decided to prospect the large ancient working on the Tat block, which work has already been commenced. On the Thornhill block the main shaft has been retimbered, and an air shaft sunk to a depth of 70 feet; this is to provide ventilation to the existing workings. A five-stamp mill, rock-breaker, 16 h.p. boiler, Evans' sinking pump, Frenier pump and the necessary water tanks have been purchased, the erection of which is almost completed. Crushing operations will be commenced about the end of the present month.

* * * *

It is stated that the Exploring Lands and Minerals Company has recently inspected the Blue Rock mine, Gadzema, with a view to taking an option over the property. The Blue Rock is at present being worked by Messrs. Goodyear and Ellsmore, who are producing monthly gold to the value of £600, half of this amount representing profit. The reduction works consist of a Tremain mill and cyanide plant. Three reefs are being opened up. The main reef, which has been sunk to a depth of 160 feet, averages 28 inches in width over a length of 60 feet, values over a stoping width of 30 inches working out to 15 dwts. per ton. No. 2 reef is given as 5 feet wide, giving good values; two shafts have been sunk on it to a depth of 75 feet, and driving has proceeded to 125 feet. The third reef is small, and of fair value, but little work has so far been done on it.

* * * *

A circular has been issued by the Selukwe Gold Mining Company, Ltd., stating that under the tributing agreement 50 feet of bona-fide new development work has to be completed monthly to the satisfaction of the company's engineer, and the company has also the right, under stipulated conditions, to terminate the agreement. The tributing lease was signed on October 19. A report by Mr. A. H. Ackermann on the tributors' operations states that on the 6th level main reef drive from the main shaft a spur reef going into the footwall was found. About 15 feet of driving has been undertaken, the highest panning obtained being 5 dwts., the majority of samples panning traces. This new discovery was opened up on the 7th level; for the first 10 feet it panned 7 dwts. over 18 to 24 inches, the recent samples taken showing only traces.

* * * *

Since the new Gold Fields Rhodesian Development Company has interests in Mashonaland quite as important, if not indeed more so than in Matabeleland, it is not surprising to learn that the company are about to erect substantial offices in Salisbury, next door to the "Lonrho" building. The plans, which have been prepared by Mr. Francis Masey, show that a substantial and useful building is to be put up. There will be very little in the way of architectural display; but it will be a solid and conveniently arranged structure, facing the Salisbury Club on one side and Cecil House on the other.

* * * *

The annual meeting of the Globe and Phoenix Company, held in London in mail week, was characterised by considerable "storminess," the directors coming in for some very sharp criticism. Mr. T. B. Reynolds, who presided, remarked that although shareholders could be congratulated on a record year of prosperity, the results in some respects fell short of the anticipations of the board. The chairman stated that the restriction of output might be traced to two causes, the more serious of them being the dearth of native labour. Mr. Reynolds proceeded: "This is by far the deepest mine in the country, and several large mines lie to the north of it, in the direction from which the main supply of labour is drawn. It is obvious that the native prefers to work in the shallower mines at a less distance from his home. In order to counteract this tendency, the management continuously devotes attention to the health and comfort of the native. The housing and hospital accommodation is excellent; our farms supply an ample and healthy diet; and our native store has a large and attractive stock of goods such as the "boys" desire as luxuries. It is generally acknowledged that the organisation of the native department on our property is not surpassed in Rhodesia. The other reason for a diminished output in 1911, as compared with estimates, was the closing down of the sands plant in April. The effect of this restriction is merely to defer the realisation of gold from this material until the new plant is running. The record output of 114,376 ozs. was obtained by milling rock of an average grade, according to "screen samples," *i.e.*, samples taken as the ore is fed into the stamps, of 36½ dwts. to the ton. The gold extracted amounted to an average of practically 32 dwts. per ton crushed, giving an average extraction of about 87 per cent., without sands-treatment for about three-quarters of the year. I may say incidentally that it was with great difficulty that ore of the grade aimed at was stoped, owing to the fact that development in depth at the north end of the mine is only possible through a winze in the rich ore, which is required to grade up the mill rock. I wish to draw attention to a satisfactory feature in the 18th level, viz., the chutes of good ore opened up on both the east and west reefs south of the junction. On the west reef, the new chute found on the 17th level, to which I referred a year ago, is now known to extend downwards to the 18th level. On the east reef, where work is still proceeding, excellent results are shown. The first 92 feet from the junction show 56 dwts. over 35 inches, and the following 86 feet driven during March—the returns for which are just in—gave 57 dwts. over 61 inches. On these two reefs, more or less parallel to one another, we have now an aggregate length of nearly 450 feet in ore of probably as high an average value as the whole of the rest of the mine. On the 16th level this part of the reef was not traced on the west reef, and was more patchy on the east reef. The present position leads one to conclude that the centre of interest of the mine has shifted from the north to the south of the junction. The effect of development on the ore reserves to the end of March is shown in the returns published a few days ago. As compared with the reserves at December 31, 1911, the tonnage is up about 3,000 tons; the average value, at 36·6 dwts. per ton, is down by nearly ½ dwt.; and the gold contents are up by about 6,000 ozs. Considering that no exceptionally high-grade ore was opened up during the period, these results must be considered satisfactory." At the conclusion of the chairman's speech, Mr. Cloutte severely criticised the administration expenses in London and objected to the directors' fees. Mr. John Howard agitated for three-monthly development reports, which should contain more information than the monthly statements as at present issued.

* * * *

The furnace of the Kafue Copper Company started again on March 19. Output for month, 49 long tons copper matte produced, assaying 63 per cent. copper. Total copper matte produced to date, 1,412 long tons of an estimated value of £57,170. The value of the copper matte is calculated with copper at £55 per ton. The present price of copper is over £70 per ton.

Rhodesian Development Co.

At a meeting of the Consolidated Gold Fields Rhodesian Development Company this week, Lord Harris, who presided, said the company's prospects were good. The company was in much the same position that the Consolidated Gold Fields of South Africa was before that company's mines were producing, though the Rhodesian Company had the advantage that its mines were even nearer the producing stage. The meeting rejected by an overwhelming majority a proposal to pay two of the directors of the Rhodesia Exploration and Development Company compensation for loss of office owing to the amalgamation.

Bucks Reef Gold Mines.

The report for the quarter ended March 31st, 1912, states that five stamps crushed 2,133 tons; total revenue, £6,844 0s. 11d., equal to £3 4s. 2d. per ton; total costs, £6,092 9s. 2d., equal to £2 17s. 1d. per ton.; profit for quarter, £751 11s. 9d., equal to 7s. 1d. per ton. The capital expenditure for the quarter amounted to £411 7s. 1d. Recovered from all sources employed per ton milled, 15·38 dwts. fine gold. Summary of development: Bucks—Driving, raising, etc., 125 feet; Prestwood—shaft sinking, 24½ feet; driving, raising, etc., 46 feet; total shaft sinking, 24½ feet; total driving, etc., 171 feet: total, 195½ feet. Bucks footage: In the 8th level west drive, the last 24 feet exposed reef going 6·0 dwts. over 54 inches. In the winze below the 8th level, 22 feet have been sunk exposing reef of value 22·4 dwts .over 27½ inches. Prestwood footage: The only reef exposed in this section was in the winze below 4th level, which gave 17 dwts. over 15 inches, for a distance of 14 feet sunk. Payable ore reserves at 31st March, 3,650 tons.

RHODESIAN MINING MEN & MATTERS.

Mr. R. R. Hollins, of Johannesburg, is visiting his Rhodesian mining interests. Subsequently he will leave for England.

* * * *

Mr. J. G. McDonald (joint manager) and Mr. H. A. Piper (consulting engineer), of the Gold Fields Rhodesian Development Company, left on Sunday for England.

* * * *

Mr. W. P. Fisher, chairman of the Viking Gold Mines, Ltd., is visiting the property from the Rand.

Jumpers G.M. Co.

The report for the quarter ended 30th April, 1912, shows:—Working expenses, to mining, 23s. 2.877d., cost per ton; reduction, 8s. 5.030, cost per ton; general charges—including maintenance, 1s. 6.790d., cost per ton; profit for quarter 2s. 7.430; gold revenue, 35s. 10.127d. The ore crushed for quarter from mine amounted to 25,110 tons. The working expenses on accumulated slimes was:—To treatment costs, 4s. 10.717, cost per ton; profit for quarter 6s. 1.911; by gold reserve, 11s. 0.628d. The total yield from mine was 10,735.460 ozs. fine gold, equal to 8.551 dwts. per ton milled; and from accumulated slimes 547.332 ozs. fine gold, equal to 2.630 dwts. per ton treated; making a total of 11,282.792 ozs. fine gold. The summary of joint profit for quarter shows:—Profit from mine, £3,228 8s. 3d.; profit from accumulated slimes, £1,281 14s. 11d.; total profi for quarter, £1,570 3s. 2d., which has been dealt with as follows:—Handed over to the Treasury Gold Mines, Limited, in settlement of their share of profit, £1,649 9s. 7d.; set aside in terms of agreement with Treasury Gold Mines, Limited (£400 per month), £1,200; appropriated by this Company, £1,720 13s. 7d.; total, £4,570 3s. 2d. The following is a list of the Company's share investments on the 30th April, 1912:—102,700 £1 shares Benoni Consolidated Gold Mines, Limited; 45 £1 shares Geldenhuis Deep, Limited; 290 £1 shares Witwatersrand Native Labour Association, Limited (12s. paid); 118 £10 shares Rand Mutual Assurance Company, Limited. The capital expenditure for the quarter was:—£2,710 5s. 3d. The ore reserves on a milling basis at the end of the quarter were as follows:—Payable, 537,475 tons, 41.71 milling width inches, 6.43 assay value, dwts.; unpayable, 360,738 tons, 46.10 milling width inches, 3.31 assay value, dwts.; totals and averages, 898,213 tons, 45.29 milling width inches, 5.18 assay value, dwts. Treatment of the slimes was carried on during January and to 11th February. From the latter date to the end of the quarter the slimes treatment was suspended and treatment of the sands only (collected on the Caldecott Table) was carried on. In the case of the slimes it was found that the cost of treatment was prohibitive because of the large quantity of moisture underflowing from the first three cones, and being pumped with the slimes into the plant, with consequent loss of gold-bearing cyanide solution at the other end, and because of the insufficient capacity of the clarifiers to deal with the increased bulk of solution.

LITERATURE FOR

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A REVIEW OF RHODESIAN MINING.—I.

Points from the Secretary's Annual Report—Some Important Figures.

THE annual report of the Secretary for Mines, just presented to the Legislative Council, contains the following:—

In my report for 1910 attention was drawn to the increase of development work which was in evidence, more especially towards the close of the year, and it is very satisfactory to report that such work has shown no diminution in 1911, but a distinct increase on the previous year. In the early portion of 1910 capital came freely into the country, attracted by the excellent results obtained on some of the bigger mines and by many of the mine workers, commonly called "small workers," who were able to carry out work on their properties to a certain point when capital was required to more thoroughly develop promising propositions. During the latter portion of 1910 and throughout 1911 the principal feature of the mining industry has been the steady systematic development of properties which should have been more thoroughly dealt with earlier. A number of small mills were closed down, and it was feared that the output would suffer considerably in consequence, but the year marks an increase on the previous period owing to increased outputs from some of the established producing mines. The result of the general development work which has been in progress will, therefore, be reaped at a later date, possibly in a measure towards the end of 1912, but certainly in 1913. We may look forward with confidence to a very considerable increase in the output in 1913, which will clearly justify the sound policy of fully developing the ore reserves in the mines, and putting them well ahead of the mill, instead of the mistaken policy of starting crushing too quickly. At the annual meeting of the Rhodesia Chamber of Mines the President stated that a reliable estimate of ore reserves had been prepared by the Chamber, which showed that the developed payable ore in sight at the present time was 6,280,000 tons, containing gold to the value of £13,000,000, or sufficient to maintain the present output for a period of 5½ years. The building up of ore reserves in the producing mines as well as the developing mines has been prominently kept in view, and such a policy will create greater stability in the industry in the future. No attempt was made to secure any figures of ore reserves from small workers, as it was no doubt realised that their industries does not permit of the accumulation of any large reserves, as they crush their ore as quickly as they can stope it. The reserves alluded to are, therefore, those of the bigger mines only. This development has on the whole shown satisfactory results, and the progress of the gold mining industry is considered by those who are well able to judge to be on a sound basis. The small worker and tributor has not been so much in evidence in 1911, except possibly in the Hartley district, but this I consider is only a temporary phase. From 1906 to 1910 the small workers were numerous; some did remarkably well, others made more than their expenses, others merely covered their expenses, whilst some were unsuccessful. In 1910 a large number of properties changed hands to companies and syndicates with capital, whilst options for a year or more were secured on other properties. In all quartz mining countries development work proves that some properties are not big enough to carry a sufficient number of stamps to make company management a success, but which will prove payable on the small worker basis. These properties are leased out on tribute, and a few successes soon attract the small man. It is anticipated that this will happen again in Southern Rhodesia as it did in the past, and an increase of individual workers will occur at no distant date. The principle of helping small workers by technical advice by engineers attached to the British South Africa Company has been again revived, and will, I feel sure, prove beneficial. This help, it seems to me, might very usefully be extended by advancing small sums of money on easy terms to this class of worker for the purchase of machinery when he is prepared to crush. By the time the crushing stage is reached the small worker is generally short of funds, and in order to obtain the necessary money, he has to part with a share in his property—very often the greater share—or borrow money at a high rate of interest. But what the country chiefly requires at the present time is fully qualified prospectors who will leave old workings alone and prospect ground which has not been touched before. The history of gold mining in Southern Rhodesia is chiefly bound up with ancient workings from which a large amount of gold was extracted at surface, or down 70 or 80 feet, by the previous gold-seekers in this country. With few exceptions the mines at present in existence have thus been discovered. But it is incredible that the gold-bearing rock of Southern Rhodesia is confined to the hills where the ancient workings are generally found. Prospectors so far have had no funds to penetrate over-burdens in search of reefs, or did not possess sufficient knowledge to locate reefs thus hidden. The geological survey which is now in progress will no doubt help towards indicating likely places, and if prospecting parties were sufficiently equipped with funds to prospect new ground systematically, and such parties were placed under the charge of prospectors with a sound knowledge of quartz mining, the results, I feel sure, would prove beneficial and be the means of infusing fresh interest in the search for virgin reefs. Another matter in which the mining industry is vitally interested, and which will help both richer and poorer miners, is the lowering of railway rates. On some items a reduction has already taken place, and it is understood that further reductions are under consideration. Working costs are an ever-present source of anxiety with the mine manager, and every effort on the mines is being made to keep them as low as efficiency will permit, but cheap railway transport is a very powerful lever to ensure success, more especially in the working of low grade propositions. . . . . Throughout the year regular visits to the various working mines were made by the Inspectors of Mines to see that the provisions of the Mines and Works Regulations for the safety of life and limb were being carried out. The results have been distinctly beneficial, and in some cases careless workers have been summoned for breaches of the regulations, which has brought home the necessity of closely observing the regulations to others. The Inspectors attended the more important inquests held on death from accident or enquiries held into serious accidents, and their technical advice as mining engineers has proved very useful to the officials holding the inquests. Monthly visits by compound inspectors to enquire into the sanitary, housing and other conditions prevailing on the mines have been steadily maintained, and their requests for improvements under the regulations have, on the whole, been cordially responded to. The price of maize was again reasonable, as the bigger mines early in the year entered into contracts varying between 9s. to 11s. per bag of 180 lbs., but towards the end of the year a very decided rise in price took place, and those who were unable to enter into contracts had to pay nearly double the above sums. This rise in maize naturally affects the small worker more than any other section of the industry, as he is unable to enter into contracts of long duration or store much grain at a time. Owing to the diminished rainfall which has occurred during the present wet season, it is considered that prices generally will be higher this year. In a few cases mills had to be closed down owing to an insufficiency of water, and this occurred towards the end of the year. The rainfall throughout the country has been comparatively so small that anxiety is expressed as to the supply of water during 1912, but so many mines obtain large supplies of water from the mines themselves that it is hoped with careful conservancy of such water no serious diminution in the number of stamps at work will occur. The number of gold producers shows a decrease of 46 producers. In 1910 there were 455, and 409 in 1911. The apportionment of this number is as follows:—Terms, claims discharged, No. of producers, 36; Section 44, M. & M.O. 1903, 1; Government Notice No. 212, 1904, 7; Renny Tailyour Concession, 1; Ordinance 10 of 1907, 355; Alluvial, 9; total No. of producers, 409. . . . . The coal production was confined to the Wankie Collieries, and a fair increase in output and sales was recorded, while it may be noted that this company has also begun to pay dividends. In 1911, 212,529 tons of coal were raised and 161,824 tons were sold for £92,193. In 1910 the figures were 180,068 tons raised, and 139,492 sold, realising £88,223. The increase, therefore, was 32,461 tons raised, 25,332 tons sold, and £3,970 in value. The further reduction in price at the pit's mouth, which will now come into operation, will enable the collieries to extend their supply to mines situated at long distances from the colliery, and to ensure this very necessary object the railways have arranged a cheaper rate for the conveyance of coal. During the year an expedition was sent to the Mafungabusi district to prospect certain seams of coal which were reported to exist there. It was felt that if good coal was secured a connection with Gatooma would allow of coal being placed on the Mashonaland mines at an easy rate. The results, however, were not as encouraging as it was hoped they would be, but further work may probably be undertaken. The mineral production and values for the year may be summarised as follows:—Gold 628.521 ozs., value £2,647,896; silver 187,641 ozs., value £19,320; lead 638 tons, value £7,822; chrome ore 52,363 tons, value £116,965; coal 212,529 tons, of which 161,824 tons were sold, value £92,193; asbestos 460 tons, value £6,396; scheelite 2 tons, value £167; total value £2,890,759. The number of stamps in use in the country showed a decrease of 88 stamps, but this is explained by the shutting down of some crushing machinery prior to more thorough development work in the mines being affected. On the crushing mines the greatest care is exercised to improve the class of machinery in use and to keep the mines as fully equipped with modern improvements as possible. Methods for the best extraction of gold are under constant and careful supervision, with the result that a higher extraction has been affected at many of the mines. The problem of the best class of machinery and extraction processes for the varied classes of ore the country possesses is being more fully understood, and the experience gained is of great use when new mines come to the crushing stage. The stamps and other crushing power in use in 1911 were, 1,699, as against 1,787 in 1910. Slimes plants have come into more general use in the country, which has helped to increase the extraction of gold. The tons of quartz crushed for gold were returned at 1,605,885 and the tonnage of tailings at 731,412. This shows a decrease as compared with 1910 of 61,029 tons of quartz and 32,710 tons of tailings. The total gold won, including the production from tailings, slimes and a small amount of alluvial, amounted to 628,521 ozs., valued at £2,647,896, being an average of 7.8 dwts., or nearly 33s. per ton milled. The average for 1910 was 7.3 dwts., and 30s. 9d. per ton milled.

(*To be continued.*)

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Iridosmine in Rand Banket.

To the Editor, *South African Mining Journal.*

Sir,—In the interesting article on the occurrence of iridosmine in Rand bankets, by C. Baring Horwood, which appeared in your last issue, the author says, *inter alia,* "that Mr. Andrew F. Crosse discovered platinum and iridosmine (more often the latter) in the Rand bankets, and also in the Black Reef at Klerksdorp," but, he adds, the first to actually publish an account of such an occurrence on the Rand was Professor R. B. Young. It may be of interest to Mr. Horwood and the readers of the *S.A. Mining Journal* to know that as far back as 1888-9 I found the metals of the platinum group in tailings from the Ariston mine at Klerksdorp, which was then managed by my firm. In 1889, when on a visit to the Old Country, I was interviewed by a Swansea paper, in which mention is made of the presence of platinum, etc., in the Klerksdorp bankets. The samples submitted to me for examination at that time was a quantity of blanketings which carried quite an appreciable amount of the noble metals.—Yours, etc.,

LEWIS WATKINS.

P.O. Box 4204.

The Government, the Government Survey, and the Government Series.

To the Editor, *South African Mining Journal.*

Sir,—The Government Survey having started with wrong premises regarding the trend, etc., of the various underlying reefs of the Rand, must naturally come to wrong conclusions, and that being so what will be the good of the survey to the Government and the public? The Government Survey, looking through Government spectacles probably, appears to recognise Government Reef series here, there and everywhere, yet the only place where it happens to be right is at Witpoortje Station, on the Krugersdorp line, where the-man-in-the-train can see it for himself, and keep it in sight for a mile or more. Government Reef, which Dr. Mellor says is "especially well seen in prospecting works north of railway between Florida and Hamburg" (known as Hutt's claims), is Du Preez series, which the patient owner has been paying Government hundreds a year for, in the vain hope that some observant geologist or mining engineer may come along and recognise it—for it is as different from the Government Reef as chalk is from cheese. Now that the Government Survey has labelled it "Government," the owner may as well, in my opinion, stop paying the Government, as the Government Reef series is not in great favour with capitalists at present, and the Government Survey is not doing Government a good turn, in return for the money the Government is expending on it, by labelling all the economic series north of Main Reef series "Government," and coolly ignoring the Blue Sky, Van Ryn and Du Preez, which are better than Government, and some day when I may have passed away, will be a source of enormous revenue to Government, in spite of the readings of the Government Survey of to-day, as set forth in your last issue. Personally, I think a man has a good action against the Government if the Government Survey comes along and labels his claims "Government," when they are really not Government, but a mile south of "the" Government.—Yours, etc.,

SCOTT ALEXANDER,
"Rand Stratigraphist."

Johannesburg, May 20.

ANSWERS TO CORRESPONDENTS.

"Miner."—"Shrinkage stoping" is a name recently given to the method of working an ore-body by over-hand stoping, drawing from the stope only that amount of the broken ore which will make the room necessary for the miners to continue to break down the back of the stope while standing on the pile of broken ore.

"Anxious."—Answered by post.

"Stricken."—Libellous.

Our Twenty-First Anniversary Number.

THE LAST WORD ON RAND MINING.

To commemorate the twenty-first anniversary of the founding of this journal, a special number, distinct from the ordinary weekly issue, will be issued in July next. Fittingly to mark the occasion, the number will contain a comprehensive and concise account of the past history, achievements and present position of every gold mine on the Rand, illustrated and brought down to the latest possible date. It will review the industry generally as well as in its several technical aspects, and will include articles by experts on the chemical, mining and metallurgical progress and problems of the fields. A feature will be made of the personal side of the industry, and a section will be devoted to its technical and administrative leaders, enriched with portraits and other illustrations. Engineering on the Rand in all its phases, electricity, steam and air power will be treated, and the growth and progress of electric power supply will be exhaustively discussed. The gold mines of the outside districts and the tin, copper and coal industries of those districts will be dealt with thoroughly and at first hand. The great diamond industry of South Africa will have a section to itself, and here, as in the treatment of the base metal industries, the letterpress will be embellished with many striking and original illustrations. Mining in the Cape, Natal and Orange Free State Provinces will also be reviewed and the undoubtedly great mineral potentialities of those, as yet undeveloped, areas will be graphically set forth. German South-West Africa will find a place in the issue and a first-hand account of the diamonds, the copper and the tin mines of that promising field will be included. Moreover, the banks and other great financial institutions, the railways and harbours of the sub-continent will be adequately dealt with, and the whole problem of transportation as it affects the inland industrial centres will be reviewed. In this connection Capetown, Port Elizabeth, Durban, East London, Delagoa Bay and Beira will be separately and fully treated and their claims examined. Apart from mining, there will be a considerable section devoted to a description of the several subsidiary industries dependent on mining for a market. Chief among these will be cement, explosives, soap and candle-making, milling and the hundred and one activities that centre in the Rand. Rhodesia and Mozambique will be given a separate and extended treatment. The different mines will be described and illustrated, and the recent progress of the industry in those territories dealt with comprehensively and lucidly. In addition, the issue will contain a number of interesting and valuable contributions from leading men in the mining and financial world, many of whom have already sent their congratulations on the decision to issue a special commemorative number of the journal. Numerous letters received from past Rand engineers and mine managers, now resident in all parts of the world, contain offer of contributions. These will form a unique collection of valuable views and reminiscences, and will considerably enhance the interest of the volume. The work will consist of upwards of 350 pages, printed throughout on art paper. Prizes are offered to artists for the best design of a suitable and striking character, and particulars are given in another part of this issue of other valuable prizes to be awarded in connection with the number. It may be added that the work will be prepared, produced and printed in South Africa, and will aim to cover the whole field of mining in this country, and to prove a fitting monument to the great industry with which, from the beginning, the *South African Mining Journal* has been associated. The co-operation of everyone interested in the industry is being enlisted to make the venture a success, and already it promises to mark an advance on anything of its kind ever before attempted in South African illustrated journalism.

THE WEEK IN THE SHAREMARKET.

Another Holiday Week—Rand Shares Finish Steady.

The week in the sharemarket practically finished on Thursday, and finished more firmly than it began. Until the Whitsuntide holidays are over, business is, of course, at a standstill, and indeed little activity is expected this month. The beginnings of an agitation in the London financial papers for an enquiry into Randfontein finances is not a "bull point" and for the sake of the place it is to be hoped there will be no more Commissions of enquiry. Tin stocks are in some demand. The Rooiberg new plant is said to be running without a hitch, and the lapse of the options has been well received. Zaaiplaats is shaping well. Diamonds are lifeless, and Rhodesians in this market dead. Political developments here and in Europe are not conducive to buoyant markets, and patience is at a premium for the moment.

	* Friday, 17th	* Sat., 18th.	* Monday, 20th.	* Tuesday, 21st.	Wed., 22nd.	Thurs. 23rd
African Farms ..	16 9B	16 9B	16 6B	16 6B	16 6	16 6
Adair-Usher Process	1 6S	1 0B	1 0B	1 6S	...	...
Apex Mines ...	37 6	...	37 6	38 0S	...	...
Bantjes Consolidated	24 6B	24 6B	24 3B	24 9B	24 6B	24 3B
Benonis	6 9	6 6	6 3	6 1B	6 0B	6 1B
Bushveld Tins ...	1 7	1 5B	1 5B	1 3B	1 0B	1 2
Brakpan Mines ...	68 6B	69 6B	71 0B	71 0B	72 6B	74 6B
Blaauwbosch ...	17 0	...	20 0	...	19 0B	19 0B
British S A. ...	29 0S	28 0B	...	...	29 0S	27 3B
City and Suburban ...	52 9	52 6B	53 6	52 6B	52 9	52 0B
City Deeps	55 6B	55 6B	...	55 0B	56 0B	57 0B
Cloverfield Mines	6 7	...	...	6 0B	5 9B	5 9B
Cons. Langlaagtes ...	22 9	22 6	22 3	22 3	22 0B	22 3B
Cons. Main Reefs ...	20 0	19 9B	19 9B	19 9	19 6B	19 9B
Coronation Freeholds	0 8B	0 7B	...	0 7B	0 7	...
Con. Investment ...	21 6B	21 6B	21 6B	21 0B	20 6B	21 0B
Concrete Cons. ...	10 0B	10 0B	10 0B	10 0B	10 0B	10 0B
Clydesdales	11 0B	11 0B	...	10 0S	...	...
Cons. Mine Selections	...	12 0B	...	11 6B	...	12 3B
East Rand Cent. ...	8 6B	8 6B	8 9	8 6B	8 6B	8 6B
East Rand Coals ...	2 6B	2 6B	2 6B	2 5	2 5S	2 4S
East Rand Deeps ...	3 0B	...	2 9S	3 0B	2 0B	2 6B
East Rand Props. ..	62 6B	63 0B	63 3	...	61 0B	61 9B
East Rand Deb. ...	...	...	...	...	£94	...
Eastern Gold Mines	1 11B	1 11B	1 11B	1 11	1 9B	2 0S
Frank Smith Diam...	9 9B	9 6B	9 6B	9 6B	9 6B	9 6
Govt. Areas... ...	26 6	26 3B	26 3	26 3	26 0B	26 0
Glencoe (Natal) Colls	...	...	...	6 6	...	7 0S
Glynn's Lydenburgs	28 0B	28 0B	30 0S	30 0S	30 0S	28 6S
Glencairns	4 0B	4 0B	4 0B	4 0B	5 0S	4 0B
General Minings ...	...	22 0S	...	...	...	...
Geduld Props. ...	23 6B	...	...	...	...	...
Jumpers	10 0B	13 0S	...	...	...	...
Jupiters	12 6S	12 9	12 9	12 3B	12 3B	12 6
Kaalfontein Diamonds	0 9B	0 7B	0 8	0 8B	0 8S	0 8S
Klerksdorp Props. ...	3 3B	3 4B	3 3B	3 4B	3 0S	3 2B
Knight Central ...	16 0	15 9S	15 9	15 9B	15 0B	15 0B
Kleinfontein Estates	27 6B	27 6B	...	...	27 6B	...
Knights Deeps ...	45 0B	...	...	43 9B	...	40 0B
Lace Props.	3 5	3 3B	3 5B	3 6	3 6B	3 6B
Lydenburg Gold Farms	9 0S	9 0B	9 0B	9 0B	9 0B	9 0
Luipaardsvlei Estates	8 0S	...	...	...	...	...
Main Reef Wests ...	28 3	28 0	27 6B	26 6B	26 3B	25 3B
M.R. West Deben...	£100	£100	£98	£100	£100	£99½
Modder B's	57 0B	56 6B	...	56 6S	56 0B	55 6B
Midas Deeps ...	0 6B	0 7B	0 8	0 8B	0 7	0 6
Middelvlei Estates...	1 9B	1 9B	1 11	1 9B	1 10B	1 9B
Modder Deeps ...	29 0B	28 3S	29 0B	...	30 0B	...
Meyer & Charltons...	90 0B	90 0B	...	...	91 0B	91 0B
New Eras	7 6B	8 0	7 9S	7 6B	7 9B	7 9B
New Kleinfonteins...	31 6B	...	29 0B	30 0	29 6S	...
New Rietfonteins ...	10 0B	10 0B	...	9 6B	9 9B	9 6B
New Unifieds ...	17 6B	...	17 6B	...	17 6B	17 6B
New Boksburgs ...	2 0	1 9B	1 9B	1 9B	...	...

B Buyers. S Sellers.

	Friday, 17th	Sat., 18th	Monday, 20th.	Tuesday, 21st.	Wed., 22nd.	Thurs. 23rd.
Nigels	15 0S	15 6B	...	...	15 6B	...
Orange Diamonds ..	1 6S	1 6B	1 6B	1 6	1 6B	1 6B
Pretoria Cement Co.	59 0S	59 0S	57 0B	57 6S	58 3B	58 0B
Paardekraal Estates	0 8B	...	0 8S	0 8B	0 8B	0 9S
Pigg's Peaks ..	13 6S	13 3B	13 6S	...	...	...
Potchefstroom Est....	...	...	...	1 0S	...	1 6B
Rand Nucleus ...	3 0B	2 10	2 10S	3 6S	3 0B	3 0
Randfontein Estates	27 0S	28 0	27 9B	27 6B	28 3	28 0
Randfontein Deeps...	4 0S	4 0B	4 0S	4 0B	4 0B	4 0B
Rooiberg Minerals ..	33 3B	33 6B	33 9	34 9	34 3B	34 9
Rand Klips	6 3S	6 6	6 4B	6 0B	6 0B	6 1S
Ryan Nigels ..	4 0B	4 0S	4 0B	4 0B	4 0B	4 0B
Rood. Durban Deeps	...	...	...	...	80 0S	...
Robinson Deeps ...	...	...	53 6B	...	...	...
Roberts Victors ...	18 0	17 0S	...	...	17 6S	...
Rose Deeps	...	...	...	...	70 0S	...
Salisburys	2 6B	2 6B	2 6B	2 6B	2 6B	2 6B
Simmer Deeps ...	4 0S	4 0S	3 0B	4 0S	3 0B	4 0S
Swaziland Tins	35 0S	...	...	...	...	...
South African Lands	4 7B	4 6B	4 6B	4 6B	4 5	4 8
S.A. Tin Mines ...	...	7 6B	7 6S	7 6S	7 6S	7 6S
S. Randfontein Deeps	3 2B	3 3B	3 3B	3 2B	3 2B	...
Sub Nigels	5 9B	5 9B	5 9B	...	...	...
S. A. Breweries ...	40 0B	40 0B	40 0B	40 0B	40 0B	40 6
Springs Mines ...	...	12 6B	...	...	13 6B	13 9S
Trans. G.M. Estates	47 0B	...	...	...	46 0B	...
Temple Tins	3 9B	3 7B	3 6B	3 1B	...	3 7B
Trans. Coal Trusts...	44 3B	...	44 3B	...	45 0	46 6
Tudors	1 0B	1 0B	2 0S	2 0S	...	1 0B
Treasury Mines ...	9 0B	...	...	...	...	...
Van Ryn Deeps ...	21 0B	21 6	...	20 6B	20 6B	20 3B
Village Deeps ...	42 6	42 0B	0S	41 0B	41 0B	41 9B
Villiage Main Reefs	...	...	...	...	...	...
Vogel. Cons. Deeps...	1 1B	0B	1 0B	0 10B	0 11B	1 6S
Voorspoed Diamonds	10	10 0B	10 0B	10 0S	...	...
Witwatersrands ...	57 9	56 6S	56 6B	56 6B	55 0B	...
Wolhuters	21 0	20 6B	20 6B	20 0S	20 0B	20 0B
Witbank Collieries...	40 0B	40 0B	40 0B	40 0B	40 0B	40 0B
Wit. Deeps	56 6B	56 0B	56 0S	56 0B	...	54 0B
West Rand Est. ...	...	...	2 9B	...	2 9B	...
West Rand Con. ...	13 0S	12 6S	12 6S	...	12 0S	...
Zaaiplaats	47 0	45 0B	45 6B	46 0	45 0S	...

B Buyers. S Sellers.

Tenders have been accepted from the following for various services:

G. F. Warren, Potchefstroom, at £1,450, for erection of school and teachers' quarters, Klippan No. 263, Klerksdorp, at £1,826, for erection of school and quarters at Fouriesgraaf No. 303, Bloemhof, at £890, for erection of teachers' quarters at Geluk No. 97, Lichtenburg; W. W. Peffers, Bloemfontein, at £5,000, for erection of boarding-house, etc., at the Eunice High School, Bloemfontein; W. C. Pijpers, Lichtenburg, at £1,400, for erection of school and quarters at Doornpan No. 137, Lichtenburg, at £825 for erection of teachers' quarters at Holfontein No. 186, Lichtenburg, at £800 for erection of teachers' quarters at Cyferfontein No. 251, Lichtenburg, at £1,425; erection of school and quarters at Welgevonden No. 284, Lichtenburg.

Companies in Liquidation.

Johannesburg Mineral Water and Gas Factory Co., Ltd., The: A general meeting will be held at 21 African Banking Corporation Chambers, Simmonds Street, Johannesburg, on June 17th. Edgar Waugh and Walter L. Turpin, liquidators.

Buffelsdoorn East Gold Mining Syndicate, Ltd.: The adjourned meeting will be held at 24 African Banking Corporation Chambers, Simmonds Street, Johannesburg, on June 17th. Edgar Waugh, liquidator.

Santoy Gold Mining Syndicate, Ltd., The: A general meeting will be held at 33 Bettelheim Buildings, Simmonds Street, Johannesburg, on Junt 8th. L. A. Whiteley, liquidator.

Diespecker Gold Mining Co., Ltd. (voluntary), May 4th; meeting, Bank of Africa Chambers, Pretoria, on May 22nd; claims to be filed with, and debts to be paid to Fred. Lance, liquidator, within seven days from May 6th.

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Electrical Notes.

ELECTRICAL ACCIDENTS IN MINES.—II.

Their Causes and Prevention and Directions for Treatment.

[By H. H. CLARK, U.S.A. Bureau of Mines.]

Explosives and Electricity.—Great care should be used in handling explosives near electric current. It requires only a very small electric spark to set off powder. An exceedingly small current passed through the powder itself will explode it. In carrying explosives in mine cars care should be taken to keep the packages off the floor of the cars and away from the iron fittings, as these frequently receive current from the drawbars, especially when the motorman is using sand on a slippery rail. Packages of explosives should be kept closed, and should not be taken into cars that are near the locomotive, as sparks are often thrown down from the trolley wheel. The safest thing to do is to keep explosives as far away as possible from all electric current. If explosives must be handled near the current, use every precaution to protect the packages.

Some Suggestions.—The following of the suggestions given below will help to lessen the number of electrical accidents:—(a) *Suggestions for Mine Foremen.*—Don't allow the men to ride electric locomotives. Don't allow inexperienced men to handle electric wires. Don't fail to protect the trolley wires at crossovers and partings. Don't allow wires to be installed in a slipshod manner. Don't fail to have wires promptly repaired after roof falls. Don't allow explosives to be carried in cars near the locomotive. (b) *Suggestions for Electricians.*—Don't fail to set a good example for less experienced men to follow. Don't work on live apparatus if it is possible to cut off the current. Don't stand directly on the ground and work upon live apparatus of any kind—get something *dry* to stand on. Don't rely upon gloves for protection, unless they are perfectly dry, free from holes ,and without metal parts. Don't, under any circumstances, work on live apparatus that is charged with a voltage greater than 650 volts. Don't handle wires carelessly just because they are insulated. Don't send an inexperienced man to work on or about live apparatus. Don't neglect to inspect your equipment regularly. Don't ever cause anyone to receive an electric shock. (c) *Suggestions for Miners.*—Don't think that it is smart to get an electric shock. Every time a man gets a shock it shows that he is lacking in care or knowledge. Don't be ashamed to be careful. You owe this not only to yourself but to others who may follow your example. Don't handle wires or electrical apparatus of any kind unless you are told to do so. Don't get off or on trips from the trolley-wire side. Don't carry tools on your shoulders when crossing under the trolley wire or when travelling in the same entry with it. Don't travel in the same entry with the trolley wire if you can avoid doing so. Don't get your explosives near electric wires. Don't allow packages of explosives to come in contact with the metal parts of cars. Don't carry explosives in cars near the locomotive. Don't ever cause anyone to receive an electric shock. Don't ride on electric locomotives. Don't fail to report when you find that electric wires are down. Don't instal temporary lights leave that work to the electrician.

Treatment for Electric Shock.—When a man has received an electric shock that leaves him senseless, two things should be done as soon as possible. First, remove the victim from contact with the electric wire. Second, revive him or "bring him to" by getting him to breathe. While removing the victim from the electric circuit, be careful not to get a shock yourself. If there is a switch right at hand, cut off the current at once; but if there will be any delay in cutting off the current, remove the body from the circuit by means of a piece of dry wood, used either to roll or push the body aside or to lift from the body whatever is carrying current to it. Tools with dry wooden handles, such as picks or axes, may be safely used for this purpose. The body of the victim can be safely grasped if your hands are protected by several thicknesses of *dry* cloth, or if you stand upon a piece of *dry* wood. When you can do anything else, you may be able to short-circuit the line with which the victim is in contact, and thus blow the circuit breaker or fuses which protect that part of the electric system. A short circuit may be made by placing an auger or drill or a piece of pipe so that it will connect the two sides of the electric circuit. For example, in case the victim is in contact with a trolley wire, the auger, drill or pipe should be thrown across the trolley wire and track rail, so as to be in contact with both. In doing this, be sure that the auger. drill or pipe leaves your hand before it touches the current-carrying part of the circuit, as otherwise you will get a shock yourself. When the victim has been removed from contact with the current, turn him on his back, loosen the clothing from around his neck, chest and abdomen, and place a small log, a rolled-up coat, or something of similar size and shape under his shoulders in such a way as to throw his head back and his chest up. The next thing to do is to draw out the victim's tongue, which can best be done by grasping it with a piece of dry cloth. This act clears the windpipe, and unless it is done, the victim cannot be made to breathe. If the rescuer is alone, he will have to keep the tongue in this position by tying it with a handkerchief or a bandage passed over the tongue and under the jaw. The tongue must be held in this position while giving artificial respiration. There are several methods of giving artificial respiration, but the one most commonly used in the Sylvester method. Kneel behind the head of the victim, grasp his forearms just below the elbows and draw them slowly backward until they are extended as far as possible over his head, and hold them there for about one second. Then slowly push the elbows forward and downward. Next press the elbows firmly against the chest and hold them there for about one second so as to drive out the air from the lungs. *Do not perform these movements hurriedly;* pumping the arms up and down is a waste of time. To complete one series of movements should take about four seconds. A very good way to time yourself is to count, very slowly, "one, two, three, four," while making the movements. Count "one" as the victim's arms are being extended, count "two" while they are held above his head, count "three" while his arms are being returned to his side, and count "four" while exerting pressure on his chest. Usually a victim of electric shock can be made to breathe within an hour, and the artificial respiration should be continued at least that long, even if the patient does not show any signs of being "brought to." If other persons are at hand, have them assist by relieving you at short intervals, and have them keep the victim warm by covering him with coats or anything else that may be at hand. After the victim begins to breathe the assistants should rub his limbs briskly and toward the heart, keeping their hands under the covering while doing so. This will help to restore the circulation of the blood, which has been for a time suspended. While arrangements are being made for removing the injured man to his home or to an hospital, treat any injuries that the victim has received. Treat electric burns exactly as ordinary burns. Before the arrival of a doctor it is proper to cover the burnt place with several thicknesses of picric-acid gauze. This gauze is now being used in nearly all mines and hospital emergency rooms. In case no picric-acid gauze is at hand the burns may be covered with clean gauze, preferably taken from sterile packages, and covered with vaseline, carbolised vaseline, olive oil, linseed oil, or what is known as carron oil, which is a mixture of linseed oil and lime-water. Cover these dressings with plenty of cotton and protect this in turn from the outside air with oiled paper or anything that will keep out the air while the victim is being taken home or to a hospital. Bandage all dressings lightly so as to cause as little pressure as possible upon the injuries.

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of oils (June 11); also for asphalt paves (June 4); also for bridgework to form extension of foot bridge, Witbank (June 11): also for the supply of 36.000 casks of Portland cement (June 18); also for the supply of writing and printing paper, boards, etc. (June 9); also for certain earthworks, masonry and concrete, including a short tunnel, in the Sand River Poort, on the Bandolier Kop-Messina railway (May 28).

The Rand Mines, Ltd., Buying Department, Box 1594, Johannesburg. invites tenders for the supply of the whole or any portion of the requirements of mealies to the Companies controlled by the Rand Mines, Limited, for a period of twelve months from 1st July, 1912.

The Chairman of the Union Tender Board. P.O. Box 371, Pretoria, invites tenders for the supply of Oilskin Capes and Mackintosh Overall Leggings to the Department of Posts and Telegraphs during the period 1st July, 1912, to 31st March, 1915. The approximate annual requirements are 500 black oilskin capes and 500 black mackintosh overall leggings (June 5).

The Chairman of Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for the erection of boarding-house, Girls' High School, Pretoria (June 7).

The Chairman of the Union Tender Board, Pretoria, invites tenders for the supply of beans, bread, coal, wood, lime, mealies, meal, fresh meat, paraffin, salt, soap (Colonial), mixed vegetables, potatoes, and general groceries to the Union Prisons Departments, the period commencing 1st July, 1912, and ending 31st March, 1913 (May 29).

The Chairman of the Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for the following services in the Transvaal Province: Erection of boarding-house, Girls' High School, Pretoria (June 7); additions to male surgical ward at the Boksburg Hospital (June 7); erection of a surgical and medical ward and operating theatre for female natives at the Boksburg Hospital (June 7).

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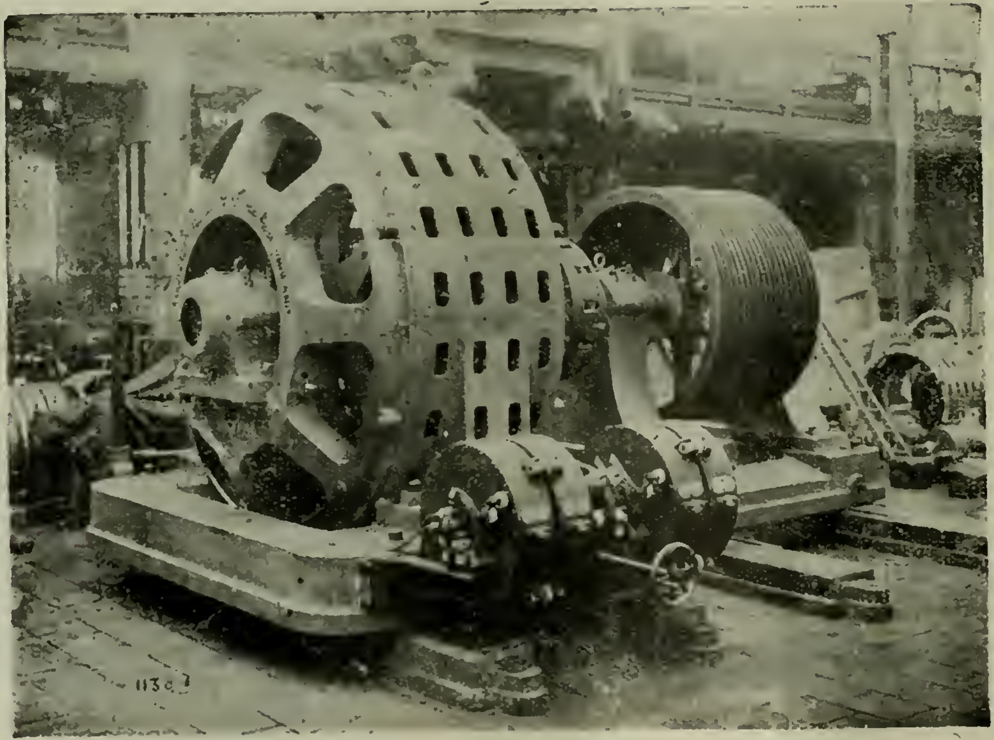

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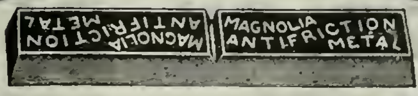

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Engineering Notes and News.

A Rand Water Board Order.

The Rand Water Board have placed an order with Messrs. Sturrock & Co., of General Mining Buildings, Johannesburg, for a turbo-driven centrifugal pump, capable of supplying three million gallons per day against a total head of 800 feet. The pump is for giving an additional supply of water to the Yeoville Reservoir, and will be installed at the Village Main pumping station. It is of the well-known pressure-drum type, and will be manufactured by Messrs. the Rees Roturbo Manufacturing Co., Ltd., of Wolverhampton. The total head is being dealt with by one single stage impeller. The motor to which it is directly connected is a Belliss & Morcom steam turbine of the horizontal impulse type, fitted with compounded blading for velocity. This order includes for complete erection and comprises, in addition to the above unit, the condensing apparatus, steam and water piping, etc.

Electrical Accidents in Mines.

The following suggestions will help to lessen the number of electrical accidents:—

(*a*) Some Suggestions for Mine Foremen.

Don't allow the men to ride electric locomotives.

Don't allow inexperienced men to handle electric wires.

Don't fail to protect the trolley wires at crossovers and partings.

Don't allow wires to be installed in a slipshod manner.

Don't fail to have wires promptly repaired after roof falls.

Don't allow explosives to be carried in cars near the locomotive.

(*b*) Suggestions for Electricians.

Don't fail to set a good example for less experienced men to follow.

Don't work on live apparatus if it is possible to cut off the current.

Don't stand directly on the ground and work upon live apparatus of any kind—get something dry to stand on.

Don't rely upon gloves for protection, unless they are perfectly dry, free from holes, and without metal parts.

Don't, under any circumstances, work on live apparatus that is charged with a voltage greater than 650 volts.

Don't handle wires carelessly just because they are insulated.

Don't send an inexperienced man to work on or about live apparatus.

Don't neglect to inspect your equipment regularly.

Don't ever cause anyone to receive electric shock.—From *Electrical Accidents in Mines: Their Causes and Prevention. Miners' Circular, No. 5, U.S.A. Bureau of Mines, Washington, 1911.*

Ladysmith Power Station.

The new power station of the Ladysmith Municipality is of a thoroughly modern type. In the engine-room are two 50 kilowatt sets of Willans & Robinson's engines, and four generators, made by the Electric Construction Co., of Wolverhampton, by which it is understood mechanical energy is transformed into electrical energy, and the prime movers in which the mechanical energy resides immediately before its conversion. Each of the generators is capable of a 25 k.w. normal load, and are run on the three-wire system. The supply to consumers is 220 volts and 440. The switchboard is of marble, and is arranged with two main generator panels and six distribution panels, with N.C.S. ampier metres, a quick brake knife switchers being attached. Overhead in the engine-room is a travelling crane with a hauling capacity of two tons. The boiler-room is well equipped. Overhead is a main feed tank, carrying approximately 10,000 gallons of water, which is pumped into the boilers by two pumps of the Frank Pearns type. The three boilers are of the Robey locomotive type, each with an evaporative capacity of 2,745 pounds of water per hour. They are built with a fire grate area suitable for burning Natal dross coal, of which roughly about 125 tons per month is consumed. The new generator which is now being laid down will supply the whole of the railway. The Railway Administration have a plant, which is of 50 kilowatt dimensions.

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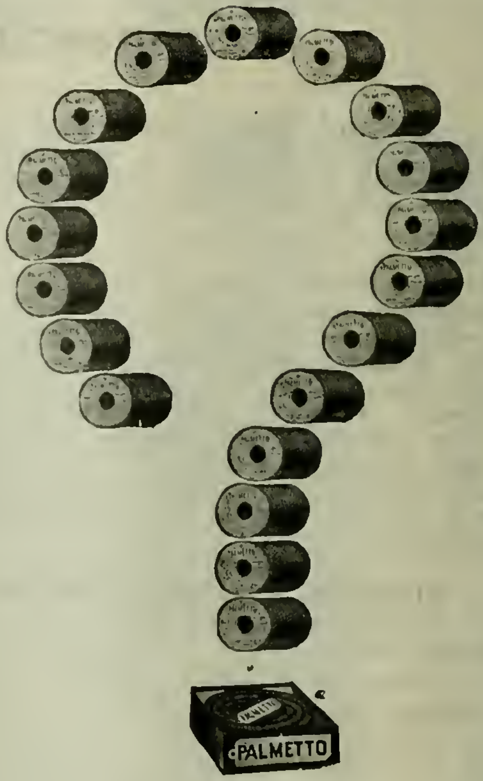

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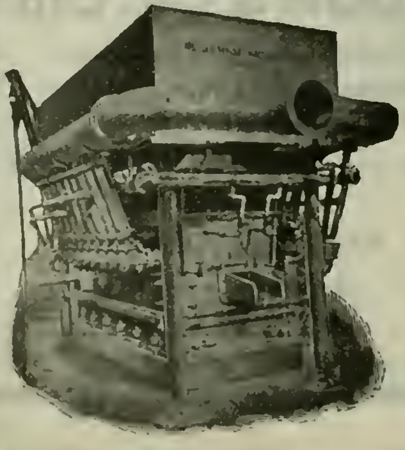

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Finance, Commerce, and Industries.

Estimated Railway Losses.

The report of the Railway Board on the proposed new lines states, with reference to the Zak River scheme, that the water is sufficient to irrigate 40,000 to 50,000 acres out of a total of 300,000, and a yield of 400,000 to 500,000 bags of wheat may be anticipated within a few years. The Board estimate that the loss during the first 12 months of working will be £46,339. The loss during the first year on the Gairtney line is put down at £3,719; the Delarey—Schweizer-Renecke line is expected to lose £8,184 in the first year, but the Board considers that with the existence of better facilities the earnings will eventually cover all obligations. With regard to the Bethal—Zandspruit line the Board calculates the loss in the first year at £13,023, and says that the line will probably earn sufficient more than to cover working expenses during the first year, and within three years its revenue should be able to meet interest and other charges as well. The Vierfontein—Bothaville line is recommended with a view to its extension to a junction with the Free State main line at or near Kroonstad. The loss on the line in the first year is estimated at £4,677. On the Aliwal North—Zastron line the loss is estimated at £8,017 in the first year, but the railway will at first earn sufficient to meet the cost of depreciation, and it is confidently anticipated that when the line is completed to Wepener the earnings will cover all expenses both of working and interest. On the Fauresmith—Koffyfontein line a loss of £6,383 is anticipated in the first year. The loss on the Ginginhlovu—Eshowe line is placed at £1,400; on that from Schroeders to Harburg at £1,956; and that from Paddock to Harding at £7,192.

* * * *

The Standard Bank.

The ninety-seventh ordinary meeting of the Standard Bank of South Africa, Ltd., was held recently, at the Cannon Street Hotel, E.C., Mr. Horace Peel presiding. The Chairman, in moving the adoption of the report and accounts, said, *inter alia*:—Our reserve fund, to which we have added £20,000 for the half-year, now stands at £1,960,000, a figure which is more than £400,000 in excess of the bank's paid-up capital, and this reserve fund, together with our uncalled capital of £4,600,000 odd, is an important factor in helping us to retain the confidence of our depositors and all those with whom we do business. There is a slight increase in the note circulation, while our total deposits show a gratifying increase of nearly £1,000,000. Our cash balances, of course, fluctuate from time to time, in the ordinary course of business, and now approximate £4,000,000, but, as you know, the magnitude of our business and the wide area over which it is spread require that our liquid resources shall be maintained at a high level. Investments show a small decline of £12,000, due to certain temporary investments having matured. The bank's investments stand in the balance sheet at a total which is considerably under their market value both at date of the balance sheet and to-day, owing to the wise policy pursued by you some years ago in setting aside an ample sum to meet the depreciation which has taken place in the value of all first-class securities. "Bills of exchange" show an increase for the half-year of over half a million—a gratifying indication of continued progress. The bank's advances show an increase of more than £400,000, and now stand at just over £11,800 000. As regards our bank premises, I may repeat that they stand in our books at a figure which we believe to be much below their total value. The gross profits show an increase of nearly £18,000, while the charges are increased by less than £4,000. This, I think, is satisfactory, bearing in mind the expenses necessarily incurred in recent branch extensions, and also bearing in mind the important fact that owing to the keen competition which we have to meet at all points, it becomes increasingly difficult to maintain the proportion of profits to expenditure which was formerly possible. We have remaining an available balance of £158,291, which we recommend shall be applied, first, in payment of £10,000 to our officers' pension fund, and next in payment of a dividend and bonus at the rate of 13 per cent. per annum. After making provision for these payments, there remains a balance of £47,600 to carry forward to the next account, as compared with £42,100 brought forward from last half-year.

* * * *

New Railways.

The details of the Railway Bill which is to be brought in by Mr. Sauer are of the greatest interest, since the railway programme has been the cause of the Cabinet crises. The following is the programme of construction for the current year which the Bill embodies:—The total length of line is approximately 560 miles, and the amount of votes required will be £2,700,000, but it is not quite clear whether the full amount will be required during the year, since a round two millions was the sum set down in the general Estimates. Of this sum the Cape gets over £1,200,000, the Transvaal £545,000, the Free State £541,000, and Natal £408,000. It will be seen that the Cape gets practically one-half of the total, and it will be interesting to hear Mr. Sauer's justification of this fact. The balance in favour of the Cape is caused by the fact that a big line from Carnarvon to Calvinia, serving a huge tract of the western part of the Cape Province, is contemplated, and will absorb practically the whole of the vote for that Province. I understand, however, that this line will only be constructed so far as funds will allow during the current year. The following are the details:—Cape Province: Carnarvon—Williston—Calvinia, 222 miles, £1,333,000; Gairtrey—Barkly East, 17 miles, £75,000. Transvaal: Delarey—Schweizer-Reneke, 36 miles, £146,000; Bethal—Zandspruit (near Standerton), via or near Morgenzon and Amersfoort, 75 miles, £398,657. Free State: Vierfontein—Bothaville, 26 miles, £106,000: Aliwal—Zastron, 49 miles, £284,000; Fauresmith—Koffyfontein, 34 miles, £150,000. Natal: Ginginhlovu, 24 miles, £104,000: Schroeder—Harding, 28 miles, £122,000; Paddock—Harding, 50 miles, £181,000. The Natal lines are light narrow-gauge railways. It will be seen that the programme, with two exceptions, provides for branch lines of a minor order. The exceptions are the big Cape project mentioned above and the route connecting Bethal with the Natal line just beyond Standerton, which is a fairly strong connecting line serving a stretch of productive country.

* * * *

The Rhodesian Budget.

The actual revenue of the B.S.A. Company's territory for 1911-12 was £808,434 (the Treasurer's estimate having been £793,900), in addition to which there was available the surplus brought forward from the previous year, £56,289, making a total available sum of £864,723. The expenditure during the year was £837,751. The surplus brought into the current year's account amounted therefore to £26,972. The Treasurer's estimate of revenue for 1912-13 is £827,000, which, together with the previous surplus, gives a total disposable sum of £853,972. And as the full estimate of expenditure is shown as £894,714, it follows that there is an estimated deficit in the current year's administrative accounts of £40,742. The difference between this and last year's positions—1911-12 surplus, £26,972; 1912-13 deficit, £40,742—is of course £67,714. A further examination of the Treasurer's statement shows that, while this year's disposable sum falls short of the figure which was available last year by £10,751, he has budgetted this year for an expenditure which is greater by £56,963.

HORNSBY-STOCKPORT SUCTION GAS ENGINES.

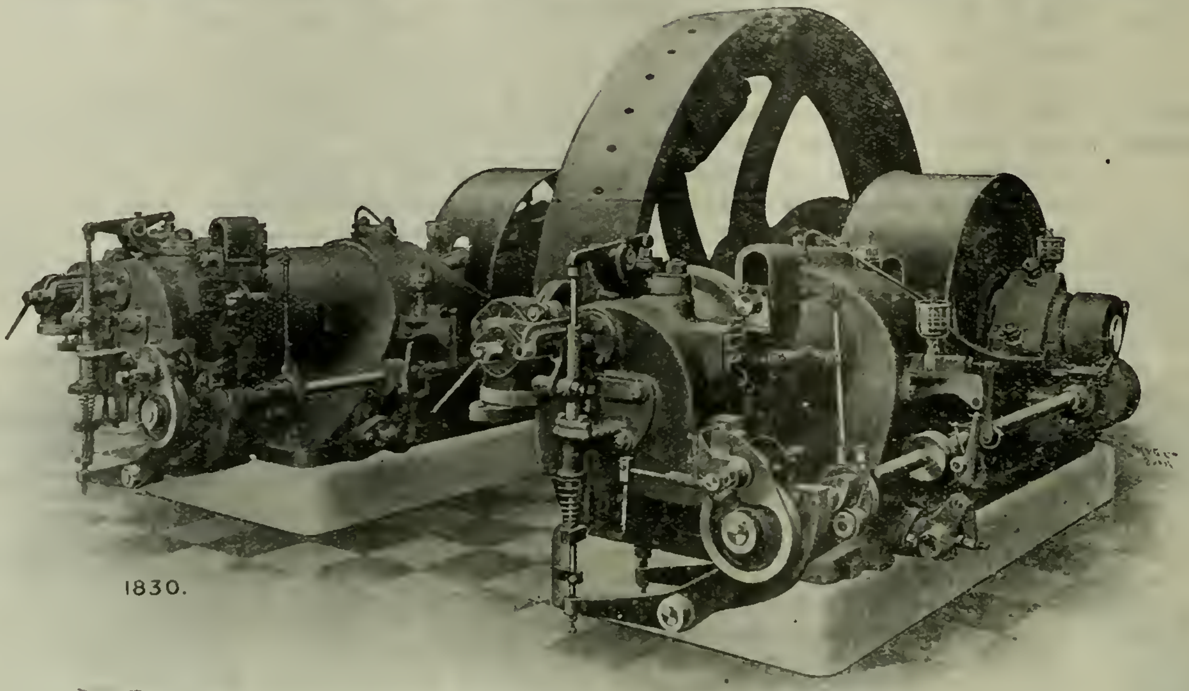

Illustration of one of the 300 B.H.P. Gas Engines supplied to the Bush Tick Mines, Rhodesia.

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State of Building Trade.

The value of plans passed by the principal Municipalities throughout South Africa during last year provides interesting reading. The figures for the Transvaal show a falling-off of some £840,960, the respective amounts for 1910 being £3,412,571 and 1911 £2,571,611. This, however, is accounted for by the fact that large Government contracts now proceeding were included in the former year, and there was an abnormal activity in the outlying mining districts, such as Boksburg, Benoni, Germiston, and Krugersdorp. It must be noted, however, that Johannesburg has increased in her figures of 1910 by about £470,000, and plans were passed during the year just closed to the value of £1,810,754. The figures for Pretoria reach a total of £149,434, while in 1910 they were £1,127,407, which, of course, includes the large Government building contracts mentioned, such as the Union Buildings. The works in hand during the year in the four important outside mining localities referred to all show six figures, and have not fallen back so much as might have been expected after the abnormal progress in the year 1910. In the coastal towns there has been marked activity. Durban, Port Elizabeth, and East London give proof of this. Kimberley has also made a considerable stride, with £68,440, as compared with £20,000 in 910. Bloemfontein shows big improvement, the figures amounting to £36,184, as compared with £9,215 in the year preceding. In Natal there has been considerable progress, especially in Durban, the figures for the port being £224,197, while in 1910 they were £189,201. Four years' totals for the four Provinces:—1908, £1,068,492; 1909, £1,621,554; 1910, £3,944,472; 1911, £3,195,279; grand total, £9.829.797. Totals of individual Provinces for four years, 1908-9-10-11:—Transvaal, £8.217,565; Natal, £691,466; Cape Colony, £829,355; Orange Free State, £91,411; grand total, £9.829,797.

* * * *

Growth of the Post Office.

In common with the other departmental documents, the report of the Postmaster-General of Rhodesia discloses a striking expansion of business during the year 1911. Postal revenue aggregated £47,521, and telegraph revenue £56,197, as compared with £43,477 and £48,616 respectively in 1910. The total revenue was £103,718, as against £92,093 in the previous year. Expenditure in 1911 was £74,269 and in 1910 £60,412. Postal expenditure increased from £27,086 in 1910 to £31,547 in 1911, and telegraph expenditure from £33,326 to £42,722, this sum including £5,524 spent on telegraph construction. Postal expenditure was increased by over £3,000 for salaries, owing to the improved scales of pay and increased staff, and telegraph expenditure by over £4,000 under the same headings. It is shown that the excess of revenue over expenditure was £29,499, but from this amount should be deducted items such as interest on the capital cost of telegraph and telephone lines, and of buildings owned by the Government and used by the Department; rentals for post and telegraph premises leased, the cost of maintenance of furniture and fittings provided under Public Works votes, and the cost of printed forms, stationery, etc., supplied by the Stationery Department. These amount to £12,432, and after making this deduction there remains a net surplus of £17,017. This surplus, the Postmaster-General points out, will be more than absorbed during the next financial year in providing new post and telegraph offices at Bulawayo, the cost of which is estimated at £23,000. Provision is also proposed to be made for introducing a double wire telephone system at Bulawayo at a cost of about £3,000.

The prospectus is published of the Transvaal Oil and Shale Syndicate, with a capital of £6,000 in pound shares, issued at par, to acquire and develop the farm Mooifontein, at Ermelo.

Contracts Open

The Secretary to the Tender Board, South African Railways Headquarter Offices, Johannesburg, invites tenders for the supply of 60 lb. and 80 lb. section rails and fastenings to drawings, Type E.100 and E.200 (July 2); also for painting, paperhanging, and glazing station buildings and employees' quarters situated within a three-mile radius of the following stations:—Braamfontein, Ermelo, Lichtenburg, Roodepoort, Piet Retief, Pretoria, Maraisburg, Germiston, Pietersburg, Krugersdorp, Springs, Rustenburg, Randfontein, Benoni, Hatherley, Potchefstroom, Boksburg, Witbank, Klerksdorp, East Rand, Middelburg, Bloemhof, Heidelburg, Belfast, Christiana, Standerton, Lydenburg, Zeerust, Volksrust, Machadodorp, Breyten, Vereeniging, Waterval Boven, Bethal, Ventersdorp, Barberton, Carolina (May 27).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of 600 posting books, required for use in the Customs Department (June 12); also for the supply, delivery, and fixing in position where necessary, certain furniture and fittings for the Post Office at Durban (June 19).

The Chairman of the Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for the erection of a school for 150 pupils at Krugersdorp West (June 14).

The Chairman of the Tender Board, Provincial Secretary's Office, Bloemfontein, invites tenders for the erection of a bridge over the Modder River (June 11).

The Municipal Council of Krugersdorp invites tenders for the supply of steel water pipes, etc., for the period from 1st July, 1912, to 30th June, 1913 (June 13).

The Municipality of Frankfort invites tenders for the supply and erecting of the pipe services and machinery in connection with the Town Water Supply (July 4).

Messrs. Howden and Stewart, Architects, 41-45, Mutual Buildings, Johannesburg, invites tenders for the demolition of present buildings and erection and completion of new building, on Stand 1757, now occupied by Messrs. Frank Stevens, President Street, Johannesburg, for Messrs. Ward and Salmons.

The Municipal Council of Johannesburg invites tenders for mackintoshes (June 1); also spares for stone crusher (June 14).

The Secretary to the Tender Board, S.A.R., Headquarter Offices, Johannesburg, invites tenders for the supply of 2,741 Petersburg standards of Baltic timber (June 11).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of fencing material and gates (May 28).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for structural steelwork, etc., for new foundry at Pretoria (June 4)

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the following services, viz.: Fencing at the Leper Asylum (June 5); erection of police buildings at Bushbuckridge, Maviljen No. 250 (June 12); drainage system and sewerage purification works at the Asylum, Fort Beaufort (June 12).

The Municipality of Boksburg invites tenders for the supply of rolling stock, converter plant, and overhead material, required in connection with trackless tramways (June 26).

The Potchefstroom Municipality invites tenders for the supply of 750 Braime's No. 8 steel sanitary buckets (May 27).

The Chairman of the Tender Board, Attorney-General's office, Pietermaritzburg, invites tenders for the following services in the Natal Province: Erection of a bridge over the Amatikulu River, M'tunzini Division (May 27); erection of a school building at Paulpietersburg (June 3); erection of a bridge over the Slang River (June 10).

The Chairman of the Tender Board, Provincial Secretary's office, Bloemfontein, invites tenders for the erection of a bridge over the Modder River (June 11).

The Chairman of the Tender Board, Provincial Secretary's Office, Bloemfontein, invites tenders for the erection of a bridge over the Leibenberg's Vlei River (May 28).

The Orange Free State Tender Board invites tenders for the supply of forage to the S.A. Police in O.F.S. (June 5).

The Town Clerk of Clocolan, O.F.S., invites tenders for the erection and completion of a water scheme at Clocolan (May 31).

Tenders Accepted.

The following tenders have been accepted for supplies to the Stud Farm at Standerton: South African Fertilizers Co., basic slag, at £3 15s. per ton f.o.r. Umbilo; dissolved bone, at £6 per ton f.o.r Umbilo; mealie fertilizer, at £6 6s. per ton f.o.r. Umbilo; Woodhead Plant Co., high-grade superphosphates, at £3 15s. per ton at Capetown; Torrance & Crawford, coal in bags, at 7s. per ton f.o.r. Oogies; smithy coal, at 7s. 6d. per ton f.o.r. Hattingspruit.

The following tenders have been accepted for the supply of dry cells to the Department of Posts and Telegraphs: Messrs. Jenkins & Co., 20,000 dry cells, No. 595, at £1,833 6s. 8d.; S.A. General Electric Co., 9,000 dry cells, No. 596, at £641 10s.; 1,500 dry cells, No. 600, at £80 17s. 6d.; Messrs. Siemens, Ltd., 250 dry cells, No. 603, at £17 18s. 4d.

New Companies.

3974. Premier Enterprises, Limited.--Adelaide Buildings, Eloff Street, Johannesburg; £200.
3975. Castle Wine and Brandy Co., Ltd.—Corner Marshall and Von Weilligh Streets, Johannesburg; £76,000.
3976. The Craighall Park Township, Limited.—15 Natal Bank Buildings, Market Street, Johannesburg; £5,000.
3977. Bonanza Sands, Limited.—34 and 35 South African Mutual Buildings, Johannesburg; £17,500.
3978. Henry Clapham, Limited.—1 Mutual Buildings, Commissioner Street, Johannesburg; £1,000.
3979. Leeuwpoort (African Farms) Tin Mines, Limited.—The Jeppe Arcade, Commissioner Street, Johannesburg; £275,000.
3980. South African Autos, Limited.—62 Plein Street, Johannesburg; £500.
3981. The Pilgrims and Sabie News, Limited.—Pilgrims Rest, District Lydenburg; £300.
3982. Newmarket Butchery, Limited.—Newmarket Buildings, Stanton Street, Stand No. 1284, Turffontein, Johannesburg; £200.
3983. The Pretoria Building Syndicate, Limited.—25 Erasmus Buildings, Church Square, Pretoria; £400.
3984. R. and J. Fleming, Limited.—Corner Pritchard and Melville Streets, Johannesburg; £21,000.

Additions and Alterations.

3686. African Paints, Limited.—Johannesburg.
3367. Mappin & Webb (1908), Limited.—Johannesburg.

Increases of Capital.

3362. Tube Mill Patents Consolidated, Limited.—Johannesburg; £3,500 to £20,000.
3705. Diespecker Gold Mining Co., Limited.—Pretoria; £2,000 to £3,000.
251. Randfontein Estates Gold Mining Co. (Witwatersrand), Limited.—Johannesburg; £3,001,458 to £3,001,548.
2304. The New Rand, Limited.—Johannesburg; £131,195 to £133.188.
2304. The New Rand, Limited.—Johannesburg; £133,188 to £134,349.
3929. Economic Investors Trust Co., Limited.—Johannesburg; £50 to £10,050.

Extraordinary and Special Resolutions.

3362. Tube Mill Patents Consolidated, Limited.—Johannesburg; power to increase capital.
3705. Diespecker Gold Mining Co., Limited.—Pretoria; power to increase capital.
3780. Artesian Mineral Waters, Limited.—Johannesburg; power to increase capital.
3691. Germiston Furnishing Co., Limited.—Johannesburg; placing company in voluntary liquidation.
3682. W. Myers, Limited.—Johannesburg; placing company in voluntary liquidation.
3982. Auto-Grip, Limited.—Johannesburg; confirmation of agreement.
3152. National Diamond Prospecting & Developing Syndicate, Ltd.—Johannesburg; that company be not placed in liquidation.
3929. Economic Investors Trust Co.—Johannesburg; amending articles of association.
644. African Board of Executors & Trust Company, Limited.—Pretoria; amending articles of association.
2494. L. & B. Exploration Co., Ltd.—Johannesburg; placing company in voluntary liquidation.
2495. The Snymansdrift Exploration Company, Limited.—Johannesburg; placing company in voluntary liquidation.
2496. Zandrivier Exploration Co., Ltd.—Johannesburg; placing company in voluntary liquidation.
3066. The Madeline Gold Mining Company, Limited.—Barberton; amending articles of association.
3144. E. W. Warby & Co., Ltd.—Johannesburg; amending articles of association.
3147. Groot Rivier Mineral Development Company, Limited.—Pretoria; placing company in voluntary liquidation.

Voluntary Liquidations.

3691. Germiston Furnishing Company, Limited, Johannesburg.
3338. The Mercantile Printing, Publishing and Advertising Company, Limited, Johannesburg.
3682. W. Myers, Limited, Johannesburg.
2494. L. & B. Exploration Company, Limited, Johannesburg.
2495. The Snymansdrift Exploration Company, Limited, Johannesburg.
2496. Zandrivier Exploration Company, Limited, Johannesburg.
3147. The Grootrivier Mineral Development Syndicate, Limited, Pretoria.

Prospectuses.

3976. The Craighall Park Township, Limited.—Johannesburg.
African Towns Electric Lighting Co., Ltd.—Boksburg.

Notices of the Situation of Registered Office.

2218. Bushveld Tin Mines, Limited.—422 Consolidated Buildings, Fox Street, Johannesburg.
3012. International Patents Exploitation, Limited.—24 Provident Buildings, Fox Street, Johannesburg.
3363. Palace Theatre, Limited.—76 Sauer's Buildings, Johannesburg.
3637. Hine & Sachs, Limited.—114, Market Street, Johannesburg.
3883. Randfontein New Agency, Limited.—Howard's Buildings, Main Street, Johannesburg.
3945. Grand Theatre (Capetown), Limited.—88-9, Exploration Buildings, Commissioner Street, Johannesburg.
3079. Solomon's Temple Tin Mines, Limited.—159-160 Stock Exchange Buildings, Johannesburg.
3874. The Union Steel Corporation (of South Africa), Limited.—Offices of the Vereeniging Estates, Limited, Vereeniging.
3891. African Film Syndicate, Limited.—6-9, High Court Buildings, Joubert Street, Johannesburg.
3074. United Agency & Trust Company, Limited.—29-31 Sacke's Buildings, Joubert Street, Johannesburg.
2500. A. R. Atkey & Co. (South Africa), Limited.—4, 7 & 8, Trust Buildings, Fox Street, Johannesburg.
1112. Middelburg Board of Executors & Trust Co., Limited.—Erf No. 220, Market Street, Johannesburg.
2134. Liederkranz Club, Limited.—Claim and Plain Streets, Johannesburg.
2141. Union Investment & Finance Company, Limited.—44, National Mutual Buildings, Rissik Street, Johannesburg.
3618. Boksburg Brick & Fire Clay Company, Limited.—4 Knox Street, Germiston.
3975. Castle Wine & Brandy Company, Limited.—Corner Marshall and Von Weilligh Streets, Johannesburg.

The South African Railways have accepted the following tenders during February:—1. Coal, Natal Province, 1912: The Natal Navigation Collieries and Estates Co., Ltd., steam coal, 30,000 tons of 2,000 lbs., at 6s. 7d. per ton, delivered in trucks Hatting Spruit; The Elandslaagte Collieries, Ltd., steam coal, 20,000 tons, at 5s. 9d. per ton, delivered in trucks, Elandslaagte; The St. George's Coal and Estate Co., Ltd., steam coal, 30,000 tons, at 6s. 6d. per ton, delivered in trucks Hatting Spruit; The Natal Cambrian Collieries, Ltd., steam coal, 21,600 tons, at 6s. 3d. per ton, delivered in trucks Dannhauser; The Natal Steam Coal Co., Ltd., steam coal, 17,000 tons, at 6s., delivered in trucks, Wessels Nek; The Dundee Coal Co., Ltd. (Burnside coal), steam coal, 42,000 tons, at 6s. 6d., delivered in trucks Waschbank; The Ramsay Collieries, Ltd., steam coal, 10,500 tons, at 4s. 6d., delivered in trucks Wessel Nek; The Ballengeich Colliery (Sir W. H. Marling), steam coal, 25,000 tons, at 5s., delivered in trucks Ingagane. Coal for Capetown, 1912:—The Dundee Coal Co., Ltd. (Burnside coal), steam coal, 30,000 tons, at 6s. 6d., delivered in trucks Waschbank; The Transvaal Coal Owners' Association, Ltd., steam coal, 54,000 tons, at 4s. 2. Crane for East London Harbour, Breakwater Extension, Messrs. Stothert and Pitt, £6,100 F.O.B., London. 3. Native rations, meat and vegetables, 1st March to 28th February, 1913:—Fresh Meat Supply, Co., Johannesburg, for Johannesburg and Germiston—Quotation "A" per 100 lbs., 27s. 1d., quotation "B" per 100 lbs., 28s. 2d.; Messrs. Angebrn and Piel, Johannesburg, for Pretoria, quotation "A" per 100 lbs., 28s. 4½d.; Messrs. Brown and Lurie, Bloemfontein, for Bloemfontein, quotation "A" per 100 lbs., 27s. 1d., quotation "B" per 100 lbs., 29s. 2d., quotation "A" supplies delivered in fore-quarters to be cut up by Administration, quotation "B" supplies delivered in parcels of weights packed in hessian and addressed to destination; Vegetables, Transvaal and Orange Free State, Mr. Isaac Cohen, Johannesburg. 4. Oorlog Spruit Bridge, Messrs. Albion Engineering Works, Johannesburg, £1,388 6s. 5d. 5. Oregon Pine Logs and Planks (sawn), Sawn Oregon Pine Planks, Messrs. Hillman Brothers, Johannesburg, 12in. x 2 in., Bloemfontein, 12,000 running ft., at 3d., £150, 12in. x 4in., Pretoria (20,000) and Bloemfontein (11,000) 31,000 running ft. at 6d., £775. Sawn Oregon pine logs, Messrs. W. F. Johnstone and Co., Johannesburg, 12in. x 12in., Pretoria (3,000) and Bloemfontein (500) 3,500 cubic feet at 69s. 9.5d. for 50 cubic feet, £244 5s. 5d., 14in. x 12in., Pretoria, 1,500, at 70s. 10d. for 50 cubic feet, £106 5s., 14in. x 14in., Pretoria and Bloemfontein, 1,875, at 70s. 10d. for 50 cubic feet, £132 16s. 3d. 6. Travelling crane for Graving Dock, Capetown, Messrs. Ransome and Rapier, 15 ton electric travelling crane for Graving Dock, Table Bay, at £3,200, delivery seven months. 7. Germiston-Delmore Deviation, Messrs. J. and W. Kelly, Johannesburg, £15,517 11s. 8d. 8. Pietermaritzburg, brick barracks, Mr. J. Campkin, Pietermaritzburg, £2,400. 9. Braamfontein, steelwork for carriage shed and new store, Messrs. Gilbert Hamer and Co., Ltd., carriage shed, steelwork (F.O.R. Congella, wharf), £5,620, erection of building (framework), £1,075; Mr. R. M. Dowson, new store, steelwork (F.O.B. British Port), £2,650. 10. Braamfontein, catering stores and offices, Messrs. Moir and Harper, Johannesburg, £11,189.

SCIENTIFIC FEEDING OF MINE BOYS.

A Concentrated Form of the Nutrient Elements of Wheat.

The importance of a well-devised and well-regulated diet for mine natives has always been recognised by all who have had occasion to consider ways and means for making them efficient and keeping them in that condition. The Government, also, for purely humane reasons, have insisted upon the providing of an ample supply of good, properly combined and prepared food materials, and have embodied their views upon the subject in a series of regulations which have been drawn up in accordance with the best available advice. Among the foodstuffs prescribed, bread takes very naturally a prominent place, and it is enacted that every mine boy shall have, amongst other rations, an 8 ounce loaf daily. Most people find out an easy stage of existence that there are various kinds of bread; good, bad and indifferent, and food experts tell us that while wheat stands pre-eminent among cereals for its nourishing qualities if properly prepared, the ordinary loaf of commerce made from it is wanting in the best of those elements which make wheat of value as a food. Bakers have made numerous attempts to remedy this defect and retain at the same time those qualities in bread which make it "eatable." Among those who have attempted to solve the problem, though on different lines, are Messrs. Spratts Patent, Ltd. Their experience has enabled them to make a biscuit which contains all the nutrient elements of wheat in a comparatively concentrated and convenient form, and a proof of their success is that they supply their biscuits by contract to the whole British Army. The local representative of the firm says of the biscuits:—

"These biscuits are manufactured from the best quality wheatmeals, and we claim they are much superior to bread, both from a feeding and economical standpoint, on account of their portability and freedom from moisture, of which bread contains a large percentage. They will keep for an almost indefinite period, consequently only the actual requirements of the compound need be supplied from the store, which should obviate any waste. Eight biscuits go to the pound; they are packed in Venesta wood cases, metal bound, each case containing 50 lbs., equalling 400 biscuits. It has been the custom of the Consolidated Main Reef to serve two biscuits in place of the 8 oz. loaf of bread, and from a practical demonstration shown to me at Maraisburg the boys seem to thoroughly enjoy them. If I may be allowed to express an opinion, I should say that a change from soft food (of which the natives get an abundance) to dry biscuits would be excellent, quite apart from the fact that the biscuits contain the whole of the constituents of the wheat. In addition, there is the important fact that the boys get the actual weight of the ration, which does not in all cases apply in the case of the 8 oz. loaf."

The price, we understand, compares quite satisfactorily with that of bread, and if there were sufficient demand to justify the erection of a factory, which would, of course, be a valuable industrial asset to the country, the cost could be materially reduced. We are informed that some 10 tons of these biscuits per month are used at the compound of the Consolidated Main Reef, and the manager states that he finds that they are "very satisfactory and are much appreciated by the natives, are very easily handled, and save wastage."

New Patents.

232. William Arthur Caldecott.—Improvements in or appertaining to apparatus for classifying crushed ore pulp.
233. George Wray Davies.—Improvements in explosive compounds.
234. Thomas Henry Chad.—An improvements in the means of igniting detonators for blasting and other analagous purposes or so called fuse.
235. Alexander Gemmell.—An acetylene hand lamp.
236. Abraham Emil Larsen and Francis Ernest Dummett.—Improvements in paint.
237. John Louis Boltt.—Improvements in apparatus for recovering precious stones and precious and base metals from alluvial matter and the like.
238. William Lippiatt and Ernest Breckle.—Improvements in catches or fastenings devices for sliding doors partitions and the like.
239. Thomas Griffiths.—Improved miner's hand-drill sharpener.
240. James Conning.—An automatic disinfecting expectorating receptacle, for hospitals and the like.
241. James Ernest Horsfield.—Improvements to the outlets of tube mills and the like.
242. Charles Mansel Porter.—Improved mixture for the purpose of igniting fuses and the like.
243. Walter Douglas.—Improvements in wind-mill heads and the like.
244. Martin Deacon and William Gore.—Improvements in or relating to apparatus for adding reagents to liquids or for mixing liquids.
245.—Sydney Males Tomlinson.—Improvements in means for cooling and preserving food stuffs and other substances.
246. Rowland Owen Pickin.—An improved tool applicable for use as a wrench drill extractor pliers, and for other purposes.
247. Thomas Ignatius Carney.—An improved appliance for seats of chairs, settees, sofas, and other articles of furniture, bed mattresses, etc.
248. Guy Aubrey Chalkley.—Improvements in supporting rock drills.
249. Guy Aubrey Chalkley.—Improvements in stretcher bars.
250. James Noad.—Improvements in apparatus for distilling shale and other bituminous substances.
251. Charles William Brown.—Improvements in pneumatic conveying apparatus.
252. Tracey William Preece.—Improvements in apparatus for recovering precious and other metals from alluvial deposits and the like.
253. William Gowan.—Improvements in rotary grinding apparatus.
254. Daniel William Fraser.—A device or apparatus for withdrawing drills, posts, fencing standards and the like from the ground.
255. George Henry Frederick Brazier.—An improvement in devices for hydraulic classification and the like.
256. Frederick Walter Baynes and Malcomess & Company, Limited. —Improvements in pumps.
257. James Wilson.—A new method of utilising waste small coal and unconsumed combustible remaining in engine ashes by means of making them into briquettes by the addition of organic binders or inorganic binders.
258. John Shanks.—An improved sanitary cap.
259. Bertram Robert Hester.—New method of extraction of precious stones and metals from their foreign particles.
260. William James Barnett and John Mitchell Lafayette Henry.—Improvements in spray devices for purifying mine air.
261. Leslie Stewart Muir.—Improvements in hose and pipe systems for distributing air to rock drilling machines and the like.
262. Thomas Bradshaw and Thomas Alexander Dryden.—Safety apparatus for truck haulage systems.
263. Charles Arthur Coles and Johannes Wilhelmus Eykelenboom.—Dust collector for rock drills.
264. Andre Leon Felicien Levy Strauss.—Improvements in torches suitable for igniting fuses.
265. Bernhard Behr.—An adjustable holder for candles, haberdashery, etc.
266. Noah Victor Hybinette.—Improvements in the electrolysis of metal salt solutions.
267. Frank Humphreys.—Improvements in the construction and use of surveyor's tapes.
268. Charles Friederich Eduard Oscar Schmidt.—Improvements in feeding means for tubular and like grinding mills.

Three facts regarding the Transvaal worth remembering:

(1) The Transvaal is producing over one-third of the world's gold output.

(2) Transvaal mines have spent 24 millions sterling on machinery and plant.

(3) The *South African Mining Journal* is the official organ of the Mine Managers' Association.

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FACTS REGARDING THE

TRANSVAAL

WORTH REMEMBERING.

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2. **TRANSVAAL** Mines have spent 24 millions sterling on machinery and plant.
3. The **"South African Mining Journal"** is the **Official Organ** of the **Mine Managers' Association.**

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Automobile Notes.

An Interesting Lecture.

A smoking concert promoted by the Transvaal Automobile Club, presided over by Mr. L. H. Lavenstein in the absence of the Mayor of Johannesburg, was held on Wednesday evening of this week at the Grand National Hotel, when a most interesting lecture was given by Mr. E. H. Waugh on his recent motor trip to Durban. The subject is becoming a most popular one, and the experiences of those who have undertaken the delightful trip share much in common. Doubtless when the proposed grand trunk road from Johannesburg to the coast emerges from that stage and becomes an accomplished fact, it will be found that the patronage accorded it will have justified the undertaking, and secured for the Garden Colony of Natal, as anticipated, the enhanced popularity which the scheme will render possible.

The Motor Traders' Cup.

Very little public interest was manifested in the competitions for the Motor Traders' and Transvaal Automobile Club Cups, held on the 16th inst., the entries being meagre, while the course selected was certainly calculated to test the patience of most drivers. The cars conforming to the rules and regulations governing the races were few, and their drivers should not easily forget their varied experiences in negotiating some four times the triangular course which constituted the route. South African motorists are invariably equal to any road emergency, especially those possessing a fair knowledge of the prevailing road surface conditions, but the line of demarcation is very defined when comparisons are attempted between "racing" over roads abounding in sluits, sand and alternate mud, interspersed by way of variety with formidable patches of outcrop reef, and journeying in leisure fashion over the same route. One is forced to the conclusion, however, that the driver, Mr. W. Wilkinson (the genial club secretary), of the 10 h.p. "Standard," the winning car in the amateur class, and Mr. E. Lang, who steered to victory the redoubtable "Sunbeam" in the professional event, apart altogether from the undoubted merits of the respective cars, exhibited a marked capability in the control of their machines, and well merited the successes attending their efforts.

Tyre Upkeep.

In a recent article one feature of the important question of tyre upkeep was discussed and suggestions put forth with a view to curtailing expenses, one of which was the more careful handling of cars, which of course involves the advised use of brakes and so forth. The most careful driver, however, will experience tyre and tube damage from one or other of the thousand causes responsible for punctures,

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Parsons Non-Skid took the Vauxhall Car successfuly through the vast sandy Russian Steppes during the St. Petersburg-Sebastopol Reliability Trial. They took Shackleton to the South Pole. 408,694 were sold in the United States of America last year.

PRICES:

For Tyres 760 mm. or under, £3 per pair.
For Tyres 800 mm. to 920 mm., £4 per pair.
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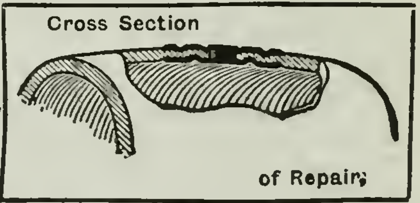

THE PARSONS RAPID REPAIR KIT

solves the problem of easy, quick and cheap puncture repair. Four simple operations only are necessary:—(1) Take out damaged part of tube. (2) Punch hole clean. (3) Stretch and insert plug. (4) Compress—and the repair is made. Once compressed, the plug can never leak or come adrift, neither can it harm the tyre.

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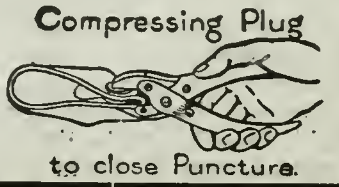

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varying from the pinhole description to the burst of formidable proportions, and this opens up another phase of the vexed tyre question, namely, how best to systematically deal with what may be termed the bugbear of motoring—the puncture. A new invention, it appears, sets aside all worry incidental to the latter, which is thus described in a contemporary: " The device is delightfully easy. No solution is used, and the only tool required is a small key for screwing up the bolts. Briefly, the " repair patch " consists of two pieces of metal, wood, fibre, vulcanite or any other materials or compositions which are sufficiently rigid for the purpose. One piece is inserted through the hole in the tube and placed on the inside of the hole. A pad of leather or other suitably flexible or resillient material is then placed between the tube and the external piece, and all the parts are then screwed tightly together by means of screws. The internal part as well as the external which is in the form of a plate of suitable shape and size according to the dimensions and shape of the hole in the tube which is to be closed by it, has along its outer edges a raised surface to form an air-tight joint round the hole in the tube. The repair patches can be made in any desired number of sizes and shapes, from which a suitable one can be selected when wanted. The device can be applied much quicker and easier than any other device used for repairing inflatable tubes, and in the case of bursts it is the only device which ensures a quick and certain repair. It will be the means of minimising the use of spare tubes for motor cars and other road vehicles, bicycles and the like, for, instead, a set of repair patches could be carried and only applied when required, thereby reducing the expense of tyre trouble to a minimum.

Noise and Speed.

As noise and speed in a car are so often associated, it is well to remark that a wrong impression of speed, in fact far beyond the actual powers of a car, is often conveyed by its clatter and rush along the highway. The silent car, on the other hand, glides so easily that its pace is much underestimated by the pedestrian. An ingenious defence was put up by a motorist some time ago, when charged with driving to the public danger, when he alleged that his car being ramshackle, with everything loose and so forth, it appeared to be travelling much faster than was really the case. The artifice might have succeeded, were it not for the fact that several previous convictions were recorded against him for exceeding the speed limit. Motorists are usually credited with an abhorrence for noise, and it is therefore surprising the number who neglect to attend to the clattering brakes which are so fruitful of much of the objectionable noise, that in nine cases out of ten, it may be remarked, is directly attributable to neglect. If the motorist, however, associated noise with inefficiency, especially in regard to his brakes, he would be much nearer the truth than is the outsider who draws conclusions from speed and noise. The results of clattering brakes are more far-reaching than the casual observer will at first sight imagine, having a direct bearing on tyre wear and general efficiency. Brakes in emergency are subjected to sufficient risk of injury without the additional strain which the clattering referred to indicates.

More Accidents.

Another serious accident, tram *versus* motor, was reported during the week, in which a leading medical man and his chauffeur sustained serious injury. The investigation will, no doubt, reveal the aggressor in this particular instance; meanwhile no attempt at criticism is justified. One thing is certain, however, namely, that a limit should be prescribed at which tram cars may travel over much frequented street intersections in particular, commensurate to the public safety. In addition, the bye-law, which, strangely enough, exempts a tram, in regard to certain conditions governing street control, to which all other vehicles have to conform, should be revised at the earliest opportunity. The case is still fresh in the memory of motorists, in which a tram car driver was exonerated in one of the local courts for disobeying the order of a pointsman to stop to allow of other traffic to cross a certain point. In the accident referred to, however, it does not appear that the tramway employee was at fault, but the result of the investigation will be awaited with interest.

Sign Posts.

Attention has often been drawn to the difficulty that motorists experience in the district parts, in the absence of sign posts to assist in directing the stranger. It will therefore come as welcome news the intention of the Government to co-operate with the executive of the Transvaal Automobile Club, who have for long given the matter serious attention, in erecting finger posts at many road junctions. The scheme for the time being is restricted to an area within a radius of 100 miles of Johannesburg. The expense, it is understood, is borne conjointly by the Government and the T.A.C., on the suggestion of the Administrator of the Province, the Hon. J. Rissik. It is certainly a step in the right direction for which the Automobile Club are to be complimented, and it is hoped that the Government participation in this matter is but the forerunner of more definite action by the Administration in other important directions, particularly in regard to the improvement of the district system of roadways.

German Motor Car Industry.

The immense growth of the German motor car industry is being watched with the keenest interest to-day by the British and American manufacturers, who seem to recognise in that rival automobile industry a force to be reckoned with in the competitive field. The total turnover with foreign countries—that is, the import and export trade in Motor cars, automobile bodies, motors and motor cycles in 1911—shows an increase of almost 50 per cent. on the preceding year, which tends to prove that foreign firms are meeting with strong competition, and that German exports are growing at a surprising rate. These facts, however, do not mean that British and other motor industries are in any way languishing. On the contrary, the demand for automobiles was never so great as during the past year in Britain and the United States. The real explanation lies in the fact that the motor car is becoming increasingly popular each year, and analysis will show that manufacturers all the world over experience no difficulty in placing as many cars as their respective firms are capable of turning out.

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Explanatory Pamphlet on Application.

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The Week's Company Meetings.

FERREIRA.

Proposed Amalgamation.

Poll To-Day.

The adjourned special general meeting of shareholders in the Ferreira Gold Mine was held on May 17, in the board room, Corner House. There were present Messrs. H. A. Rogers, chairman, H. C. Boyd, E. A. Wallers, F. von Hessert, M. Dold, W. Hudson, P. Dreyfus, G. Hesse, C. L. Read, H. Eckstein, H. Barry, C. Stuart, A. Feltham, S. C. Steil, secretary, and others.

The Chairman's Speech.

The Chairman said: This meeting stands adjourned from last Friday, as the quorum was not then present which was necessary to enable us to consider the business for which you have been called together. We have to consider to-day, whether we shall confirm the provisional agreement, which has been in your hands for some time, whereby this company disposes of all its assets, other than a certain amount of its cash, to the Ferreira Deep, Ltd., in exchange for 70,000 Ferreira Deep shares. If the agreement is confirmed to-day and at the confirmatory meeting on the 4th of June, this company will go into voluntary liquidation, when our shareholders will receive one Ferreira Deep share for each Ferreira share now held in addition to a cash bonus of 10s. per share. The terms of this agreement have naturally received very careful consideration at the hands of your board, and in the circular which was issued with the notices calling the meeting it was stated that the board recommended them for your favourable consideration. It must be stated that one of your directors, Mr. Von Hessert, differed from his fellow-directors in his opinion.

Independent Valuation.

At the instance of certain shareholders, an independent report on the proposed terms of sale was obtained from Mr. J. W. H. Stubbs, technical adviser to the General Mining and Finance Corporation, Ltd. Mr. Stubbs made a careful investigation of the position and prospects of our mine and that of the Ferreira Deep, Ltd., and I am glad to be able to state that his conclusions as to the profit to be derived from both mines are almost identical with those which Mr. Cazalet, your consulting engineer, had arrived at before the scheme was submitted to you. Mr. Stubbs, however, differs in regard to some of the financial details (in respect of which I consider his conclusions are open to argument), and concludes by recommending that the shareholders of this company should receive the 95,000 Ferreira Deep shares sum the dividend declared by that company last March; that is, that they should receive further 4s. per share, making the proposed bonus 14s. instead of 10s. per share. If this be done, Mr. Stubbs considers that the scheme is a fair one and in the best interests of both parties. On receipt of Mr. Stubbs' recommendation, the Ferreira Deep, Limited, was approached with a view to obtaining this additional consideration. I regret to say, however, that that company has definitely stated that it cannot see its way to amend its terms, as it considers that it has made the best offer which it is entitled to make for our property, and that if we cannot see our way to accept these terms it regrets that the question of purchase must be finally dropped.

Ferreira Deep Declines to Amend Offer

Under these circumstances, it has been for your board to decide whether it will still recommend the present scheme for your acceptance, that is whether it is most in the interests of shareholders that our company should continne its separate existence or whether the proposed terms for the sale of its property, as embodied in the agreement before you, should be accepted. After the fullest consideration, we have considered that the interests of our shareholders will be best served by confirming the agreement. I need hardly say that had this independent investigation disclosed any serious error on our part in valuing the respective properties I should not be recommending the scheme to-day, but this is not so. In a scheme of this nature opinions are bound to vary, and the difference which Mr. Stubbs makes in the comparative valuation of the two companies' assets is not such as to lead us to change our opinion that it is in the interests of the Ferreira Company to amalgamate this property with that of the Ferreira Deep.

Board Recommends Agreement

We have come to this conclusion, though we consider that Mr. Stubbs' recommendation is, on the whole, a reasonable one, but as the extra consideration cannot be obtained, we adhere, as I have already said, to the opinion that the terms of the provisional agreement should be confirmed In coming to this conclusion we are supported by Mr. Cazalet's carefully considered opinion that this is the right course to adopt. It may be as well to mention that when this purchase and sale was first under consideration Professor Lawn, acting on behalf of a large body of shareholders in the Ferreira Deep, and after careful examination of the two mines, came to the conclusion that the terms at present offered by the Ferreira Deep were excessive, and he recommended that they should be reduced by a sum exceeding that by which in Mr. Stubbs' opinion they should be increased.

I would urge very strongly that the scheme be accepted.

Ferreira Deep's Improved Profits.

It was only within the last few weeks it has come before me that our profits in the Ferreira Company are rapidly diminishing. I expected fully a return of £12,000 profit per month for the current year, but we have already dropped to £9,000 for April, and I do not see that this rate of profit will be increased, in fact, it seems to me a very uncertain but decreasing item, but on the other hand the prospects of the Ferreira Deep have quite changed, you will have noticed that the profits for the lost two months have increased, and everything tends to show that this will be maintained, and I think recent returns will be improved on. In addition the latest development of the mine gives a larger percentage of payability to that calculated for, and Mr. Cazalet informs me that the profit for this month is is likely to be about £15,000.

Though I have told you that the Ferreira Company's profits are decreasing, if we get this amalgamation it means that we shall put the Ferreira Deep, of which we shall become shareholders, in a still stronger position, because ore will be worked through the Ferreira shafts, from the first level of the Ferreira Deep and the whole battery of 120 stamps belonging to the Ferreira Company will be again worked instead of 60 stamps, which is all we can manage for the Ferreira Company at present.

Were it not for these facts—for the Ferreira Company's output going down and the increasing possibilities of the Ferreira Deep, one might have hesitated to nrge this scheme in the face of some opposition, but now we are convinced we are acting in the best interests of shareholders in accepting the original proposition. It is only reasonable, moreover, in a scheme of this nature, to consider the market values of the respective shares. if these be taken into account it appears to be very plain that the shareholders of the Ferreira Company are making a good exchange in accepting a Ferreira Deep share plus 10s., for one of their shares.

The Chairman then proposed that the provisional agreement be adopted.

Mr. Von Hessert Opposes.

Mr. Von Hessert said he had been against the amalgamation from the beginning because there was no report before him; there was one now before the board, from which he could value the work of the Ferreira Deep. Further, he was under the impression that the value of the Ferreira was more than they were getting under the amalgamation scheme. He knew now that a report had been made by an independent gentleman and the conclusions to which that gentleman had come had been submitted to him, but he would like to come to his own conclusions. He must adhere to the standpoint which he took up from the beginning, and he would vote against the resolutiotus. He was pleased to notice from the chairman's speech that the prospects of the Ferreira Deep were bright, and he hoped that all that he had prophesied would come true.

A vote was then taken, and six voted in favour and five against.

The Chairman declared the resolution carried.

Mr. Von Hessert: I demand a poll.

Mr. Hudson: I support Mr. Von Hessert in demanding a poll.

The Chairman said the poll would be held at the close of the meeting.

Two more resolutions were proposed, and the voting was the same in both cases.

The meeting was adjourned to a quarter past four.

Ferreira Absorbed.

A special general meeting of shareholders in the Ferreira Deep, Ltd., was held on the 17th inst. to consider the purchase of the property and assets of the Ferreira Gold Mining Co., Ltd. Mr. H. C. Boyd presided. There were also present Messrs. H. A. Rogers H. Eckstein, M. Honnet, F. Boerckel, J. E. Allingham, J. Munro, J. Berry, J. F. Rutherford, G. Imroth, and F. H. Barry.

The Chairman's Speech.

The Chairman said: As you are aware this meeting stands adjourned from last Friday. There is no need for me to detain you with any lengthy statement regarding the business which we have to consider to-day, which is fully set forth in the notices convening this meeting, and the details of which have been before you for a considerable time.

As most of you will know, the Ferreira G.M. Co., Ltd., has to-day confirmed the provisional agreement which we are met to consider, and it remains for us on our part to confirm it or otherwise; I need hardly say we recommend that it should be confirmed. It will be in the knowledge of some of you that an independent investigation has recently been made into the position and prospects of our mine and that of the Ferreira G.M. Co., Ltd., by Mr. J. W. H. Stubbs, consulting engineer to the General Mining and Finance Corporation, Ltd. The result has been the confirmation in a gratifying manner of the main conclusions on which we entered into the provisional agreement. As is presumably to be expected in a transaction of this nature Mr. Stubbs was unable to agree absolutely with the comparative valuations which we had made of the assets of the respective companies, and in a report to the Ferreira G.M. Co., Ltd., recommended that our company should deliver the 95,000 Ferreira Deep shares cum instead of ex the March dividend, that is, that the Ferreira G.M. Co., Ltd., shareholders should receive a bonus increased by 4s. above the sum contemplated in the provisional agreement. In Mr. Stubbs's opinion, if this could be arranged the scheme is fair to and in the interests of both companies.

Better Terms not Justified.

The Ferreira G.M. Co. Ltd. in consequence, approached this company with a view to obtaining these improved terms, but to our regret we had to inform them that we had made the best offer we felt justified in making, and that the agreement must be confirmed as it stood or the scheme be abandoned altogether. I may add that Mr. Stubbs was afforded every facility for examining our mine and investigating our company's affairs generally.

I now beg to move—(1) That the provisional agreement dated February 12, 1912, made by and between the Ferreira Gold Mining Company, Ltd., as vendor, and this company, as purchaser, for the sale to this company of the entire undertaking, property, and assets, with the exception of sufficient cash funds—(a) to make a cash distribution of 10s. per share to its shareholders, and (b) to complete the purchase of 25,000 fully-paid shares in this company, at a price not exceeding 76s. each; and the assumption of the liabilities of the Ferreira Gold Mining Company, Ltd., as at January 1, 1912, be and the same is hereby ratified, confirmed and adopted. (2) That the directors be and they are hereby authorised to carry the said agreement into effect, to take transfer of the Ferreira Gold Mining Company, Ltd.'s property and assets aforementioned into the name of this company, to increase the nominal capital of the company from £910,000 to £980,000, by the creation of 70,000 new shares of the nominal value of £1 each, and to issue the same as fully paid up to the Ferreira Gold Mining Company, Ltd., or its liquidators, on transfer of the said property purchased being duly registered in the name of the purchaser and due delivery being made. (3) That the maximum number of directors fixed at five by Clause 79 of the company's articles of association shall be and it is hereby increased to six.

Mr. John Munro said it was gratifying to find that Mr. Stubb's calculations had come so close to those of their own engineer. These calculations were about 5d. per share, and when two calculations could be brought so close as that the Ferriera Deep had every reason to be pleased with the impartial way in which the engineers had recommended the amalgamation. In his (Mr. Munro's) mind there was no question that the amalgamation would be beneficial to the shareholders of both companies, and for that reason he had pleasure in seconding the resolutions.

The resolutions were then put and carried. The actual voting was 639,443 shares. One holder of 50 shares sent a proxy protesting against the course that the meeting adopted.

KNIGHT CENTRAL.

Annual Meeting.

Recent Development.

Hopeful Indications.

The fifteenth ordinary general meeting of shareholders in Knight Central, Ltd., was held on May 17 in the board room, Cullinan Buildings. There were present Messrs. W. H. Dawe, chairman, J. Jolly, H. Eckstein, A. G. Gill, W. H. B. Frank, E. Rothschild, A. S. Pearse, and H. G. L. Panchaud, secretary, representing 66,543 shares out of the issued capital of £900,000.

Chairman's Speech.

The Chairman said: This meeting was convened for the 22nd of March, but was adjourned in order that the reports and financial statements might be circulated to shareholders in Europe, giving them time to study the same before the meeting was held. This procedure has now been adopted generally by the Rand Gold Mining companies; and the alteration necessary, which allows the annual general meeting to be held at a later date than usual, has been made in your company's articles of association. The reports which have been circulated give detailed information in regard to the past year's working, and deal with some points which are usually referred to in the Chairman's speech. I shall therefore briefly review the past year's working, then give some information in regard to the latest developments. Personally, I am glad that the annual meeting was adjourned until to-day, as the latest information is of a distinctly more hopeful character than that which we have had for some time previously.

Profit and Labour.

Turning to the accounts, the profit from milling for the past year amounted to £70,817, as against £79,011 for 1910, though the tonnage milled was rather higher. The grade also showed an improvement of 6d. per ton, but, unfortunately, we have to place against this an increase of approximately 1s. 3d. per ton in the working costs; this increase was due to higher costs of native labour and to the lower efficiency of that labour. Much has been said about the competition for labour and the increased cost therefrom. Undoubtedly it is highly desirable that the mining houses should come together on this point, as the advantages to be derived are so considerable. It is an open secret that efforts in this direction have been made for some time past, and though an understanding has not yet been arrived at, I am not without hope that a satisfactory solution of the question will be found before long. Your company suffered considerably from shortage of labour during the later months of the past year, when the influx of natives was very much smaller than usual on account of the abnormal season; I am glad to say that during the current year we have had a very much better supply. Every effort is being made to use machine drills to the best advantage, and you will gather from the manager's report that of the tonnage obtained directly from stoping 59.3 per cent. was broken in machine stopes and 40.57 per cent. in hand stopes.

Development.

During the year the west shaft was sunk 623½ feet on the incline, thus bringing it to a total depth of 3,812½ feet—that is, within 131 feet of the 13th level (at the present time the shaft is 50 feet below this level); while the east shaft was sunk 34½ feet, bringing it to a depth of 4,130 feet. Exclusive of shaft sinking, the footage driven during the year amounted to 10,179 feet, and when I mention that, exclusive of shaft sinking, the total footage driven since the inception of the company amounted—up to the end of the past year—to 72,652½ feet, you will realise that the work of development has not been neglected. The difficulty has been that we have had such a large percentage of unpayable development to take into account. On the 31st of December last the payable ore developed or exposed amounted to 644,300 tons, of a value of 6 dwts. over an estimated stoping width of 60.6 inches, which is a decrease of 55,700 tons on the reserves of the previous year. The greater part of this decrease is due to the exclusion of 39,700 tons which were included as payable in the reserves at the end of 1910, but which have now been excluded on account of the fuller information available. There is one characteristic feature which is also a fortunate one—in regard to the development, and that is the average width of the reef, which still remains over 60ins. It is undoubtedly disappointing that the large amount of work done did not result in a considerable increase in the ore reserves; and it was that consideration which led your directors to the conclusion that it was in the best interests of your company that no dividend should be declared in December last. At the last annual meeting I dealt with this question very fully, and gave the reasons why a dividend of 5 per cent. was declared in 1910, explaining that the declaration of a dividend in 1911 would depend entirely on the results of developments. These results, as you are aware, were disappointing, and I think you will admit that your board adopted the best course possible in deciding to strengthen the cash resources of the company. The first consideration was to insure the future of the company, and with the ore reserves at its disposal it is possible to estimate the results of milling operations for some distance ahead, say from 12 to 18 months; but assuming for a moment that the development continued unsatisfactory, your company would be in the unenviable position of having exhausted its reserves and distributed its cash. That is the position which your directors wished to avoid, and I think it is the only feasible policy if your company is ultimately to be brought to a strong position. For the first three months of this year the profits showed a very considerable decrease, but I am pleased to be able to state that the profit for April is much better—that is £6,050, as the grade has considerably improved.

Recent Operations.

In regard to the recent developments, the following points will be of interest: Work is being done on the 1st level, west of the west shaft, on the main reef, and the last 25 feet averaged 12.5 dwts. over an estimated stoping width of 73 ins.; altogether in this raise 235 feet have been exposed which average 15.5 dwts. over an estimated stoping width of 51ins. The south reef in this section also has given good results, which vary from 11 dwts. to 16 dwts. over a stoping width. On the 9th level, east drive from the west shaft, work was restarted on the south reef leader,, and 130 feet exposed average 11.4 dwts. over 36ins. On the 11th west drive, on the south reef, we have had one of the most encouraging features—the face of the drive is 170 feet west of the west shaft, and the last 60 feet have averaged 12.8 dwts. over an assumed stoping,width of 68ins. The 12th west drive has not been advanced as far as the 11th, and this drive, which is now 98 feet west of the west shaft, also gives encouraging values, namely, 5.5 dwts. over 65ins. for the last 515 feet, which footage includes 75 feet of unpayable reef. These remarks refer to the western section of the mine. In the eastern section the 13th and 14th levels were very poor, but the 15th level, which is the lowest in the eastern part of the property, is giving encouraging values—the last 40 feet driven east and west averaging about 7 dwts., and the total of 310 feet already driven in both directions gives an average of 8.5 dwts. over 50ins. It would not be wise to assume from these values that the outlook has entirely changed, but one must admit that they are distinctly hopeful indications, especially as they occur at different points of the mine. A continuance of these values would mean that the ore reserves would be rapidly increased. In conclusion, and partly in reply to letters which I have received, I should like to add that your directors fully realise that shareholders were disappointed in not receiving a dividend last year, and also at the failing off in profits for the first three months of the current year; it is a tax on their patience which, unfortunately, was unavoidable, but I can assure you that the management was unflagging in its efforts to obtain better results; and I sincerely hope that the information which I have given you in regard to the latest developments is the beginning of a more prosperous time. I now beg to move the adoption of the reports and accounts, as submitted.

The directors, Messrs. W. H. Dawe, E. A. Wallers, H. Eckstein, R. R. Hollins, J. Jolly, F. R. Lynch and A. G. Gill, were re-elected.

Messrs. C. L. Andersson and Co. and C. Stuart, were reappointed auditors, and their remuneration for the past audit, was fixed at a hundred guineas each.

AURORA WEST UNITED.

Liquidation of Liabilities.

Creation of New Shares.

Efforts of Directors.

An extraordinary general meeting of shareholders of the Aurora West United Gold Mining Corporation, Limited, was held on May 18, in the General Mining Buildings, Sir George Albu presiding. There were present: Messrs. A. French, W. H. Betz, A. Rosendorff, L. Elkan, S. Benning, W. P. C. Hastie, P. R. Lavis and J. V. Blinkhorn, secretary.

Resolutions were submitted and unanimously passed, authorising a reduction and an increase of capital in accordance with proposals set forth in the speech of the Chairman, who said:

This is the first of the two meetings which, in terms of the Transvaal Companies' Act, must be held before the statutory formalities in connection with the reduction of the share capital of a company can be carried into effect. As you will have observed from the official notice convening this meeting, the resolutions which I will subsequently propose, provide for the reduction of the capital from the present issued amount of £212,705, in 212,705 shares of £1 each, to £106,352 10s., divided into 212,705 shares of 10s. each, and moreover that your directors shall be authorised afterwards to increase the capital by the creation of new shares of the nominal value of 10s. each, not exceeding in all 387,295 shares, and to deal with such shares as they (the directors) may deem fit. At the annual general meeting of shareholders held a fortnight ago, I referred briefly to the reasons which actuated your board in proposing the rearrangement of the company's capital in the manner in which the special resolutions to be passed by you to-day indicate.

The One Objective.

The one objective is, of course, the liquidation or capitalisation of the debt due by the company to the General Mining and Finance Corporation, Limited. It is obvious, however, that in view of the present market quotation of under 10s. per share, for the shares of your company, it would be hopeless to expect any financial firm or company to take up new shares at the existing nominal value of £1. It is for this reason that you are to-day being asked to approve of the reduction of that nominal value from £1 to 10s., and, for the purpose of subsequently carrying out the project of liquidating your company's liabilities, to authorise your board to create 387,295 new shares, also of the nominal value of 10s. each. I think that most of you will appreciate the necessity for powers being given to your directors for dealing with these new shares, as they may deem fit; favourable opportunities for placing large blocks of shares occur as a rule only in times of good markets. If the required special meeting of shareholders could be called at short notice, it would not be so necessary for your board to be given these powers; but, as you are probably aware, it is expressly stipulated in the recently enacted Transvaal Companies' Act that a special resolution of such a nature as that authorising the reduction of capital of a company is only valid if passed at a meeting, notice of which shall have been published at least two months before the date fixed for the meeting in a leading daily newspaper, published in London, and subsequently approved at a confirmatory meeting held not less than fourteen days afterwards. This means a matter of at least three months before effect could be given to any scheme for the capitalisation of your company's debt—except, of course, in the manner now proposed—and at the end of such a period it might very easily be the case that the favourable opportunity for the underwriting, guarantee, or other disposal on satisfactory terms of the new shares might have passed.

Dealings in New Shares.

As regards the shares, the creation of which by your directors will presumably be authorised to-day, naturally I cannot at present definitely state how these will be dealt with, but I may say that we are considering the advisability of entering into an agreement with the General Mining and Finance Corporation, Limited, whereby the new shares shall be granted to the latter under option for two years at par, in consideration of the continuation of the loan by the Corporation. I am hopeful that in the event of the agreement being entered into we shall be able to introduce a clause to the effect that at some time during the currency of the option the Corporation shall offer to shareholders of your company a certain proportion of the new shares at the same, i.e., the issue, price, but, as you will readily understand, it is undesirable at this present juncture to bind either your board or the Corporation in this direction. It might quite easily happen that an opportunity would occur for the placing of the whole or a larger portion of the new shares by the Corporation, which would preclude any condition as to their being offered in the first place to shareholders of this company. I need not, however, dwell on this matter at the present moment, inasmuch as, in the event of any such agreement being provisionally entered into by your directors, we shall convene a further special meeting of your company, at which the agreement will be submitted for approval, but which will only require the ordinary length of notice to shareholders provided for by your articles of association.

Company's Liability.

In reference to the company's liability to the General Mining and Finance Corporation, Limited, which appeared in the balance sheet at the 31st of December last at £161,211, this had further increased at the end of last month to £174,035, owing to the expenditure on mine equipment and development in connection with the increase of the crushing capacity from 60 to 80 stamps recently effected, and the overhauling and renovation of the mill which has just been completed. The issue, therefore, of the 387,295 new shares of 10s. each would not only liquidate the existing liabilities of your company, but would also provide approximately £20,000, which would be available for any further capital expenditure that might be available in the company's interests. I referred, in some detail, at the annual meeting a fortnight ago to the new construction work entailed by the increase of the reduction works, and I think, therefore, it is unnecessary for me to go over that ground again to-day. The effect, however, will I hope be of considerable benefit to your company, as the treatment capacity has now been augmented from the figure of about 11,000 tons to approximately 15,000 tons per month. Naturally, the effect of an increase of output capacity by about 36 per cent. cannot be immediately felt in full proportion, as there is always a certain amount of reorganisation, both on the surface and underground, in these cases, which takes some little time to get into effective working order. I am hopeful, however, that in the course of the next few weeks normal conditions on the new basis will prevail, and that as a consequence the pre-existing level of profits will be appreciably raised.

Capital and Profit.

I may point out that the issued capital of the company, even if and after the 387,295 new shares be taken up, will only aggregate £300,000, and that the working profit of your company for the last two years has amounted to over £30,000 per annum, or equivalent to about 10 per cent. on £300,000. This has been obtained on a milling basis of about 11,000 tons per month, and I think it is only reasonable to anticipate that the increase to 15,000 tons monthly, which has now been effected, should result in still larger profits. So that, if in the near future the liquidation of the company's indebtedness can be accomplished through the means now proposed, the net earnings of your company should be sufficient to cover the annual distribution of dividends showing a very fair percentage on the capital. There is one point which it is only fair to your board that I should bring out to-day, viz., that since the end of 1905, not one penny piece has been paid or credited to your directors in respect of directors' fees, nor has any remuneration whatever been received by me, as managing director of your company, since the date when I first took over that position, some ten years ago. In this connection it is evident that the item appearing in the profit and loss account of your company during recent years, under the heading of "directors' and auditors' fees," is somewhat misleading. As a matter of fact, the subheading has simply been continued in the profit and loss account in the same form as obtained years ago, when directors' fees were actually being paid: even in those days, however, the fees were very small indeed, as will be apparent when I inform you that the largest amount paid out in this respect in any year was £73, divided between the whole of the members of the board! Perhaps this essentially practical instance of the efforts of the directors in the interests of their company, may give some food for thought to those of our critics who so freely labour the well worn subject of the rapacity of the administrators of gold mining companies on these fields.

Unrewarded Directors.

The increasing care and anxieties attaching to the economical working of a gold-producing mine are manifold, and I sometimes wonder how many of those gentlemen who so freely ventilate their opinions, would view the prospect of expending their experience and energies on behalf of a profit-earning company for many years without the slightest pecuniary reward for their services. In concluding my remarks, I may perhaps make the somewhat obvious explanation that the proposed alteration of Article 35 of the company's articles of association is for the purpose of eliminating an obsolete and useless provision.

After the necessary resolutions had been moved and carried, the Chairman said: The further extraordinary general meeting, called for the 10th of June, for the purpose of receiving a report of this meeting, and confirming the resolutions, was a formality required by the provisions of the Transvaal Companies' Act.

APEX MINES, LTD.

Meeting Adjourned.

The annual meeting of the Apex Mines, Ltd., was held in the board room, fourth floor, National Bank Buildings, on May 22. Mr. W. Dalrymple occupied the chair, and among those present were Messrs. G. R. Airth, C. R. Pinder, G. C. Fitzpatrick, J. H. Ryan, E. H. Read, W. A. Nellist, E. J. Way, consulting engineer, H. F. Webber, G. W. Austin, and C. A. Wentzel.

Chairman's Speech.

The chairman said: Since the date of this meeting was arranged, your Board have had under consideration the provision of further funds, not only to continue your development programme, but also to provide reduction works, and in connection therewith the advisability of effecting an amalgamation with your neighbours, the Benoni Consolidated Gold Mines, Limited, has also been under consideration. A notice was issued in the public Press on the 25th of April last, to the following effect: "The Board have under consideration proposals for the acquisition of the assets and liabilities of the Benoni Consolidated Gold Mines, Limited, and the provision of adequate working capital. Under these proposals it is suggested to increase the reduction plant of the Benoni Company up to a capacity of forty thousand tons per month, on which basis the combined company should be able to mill in about a year's time. The Boards of both companies have secured the services of Mr. C. D. Leslie, Consulting Engineer to the Consolidated Goldfields, who will make an independent report and valuation, which will be submitted to shareholders. The report will state, inter alia, whether the proposed amalgamation is a sound mining proposition, and whether the terms proposed are fair and equitable to both companies."

In the interim, Mr. Leslie's report has been received, and its contents have been the subject of correspondence by cables with our London friends; however, as the negotiations have not reached such a stage as will permit of a definite statement being made to shareholders, your Board have considered it in your best interest that this meeting should be adjourned for a period of one month, say to the 19th day of June next. It is hoped that by that date the negotiations at present being conducted will have reached finality one way or the other. Though this is the ordinary annual general meeting, your Board are desirous of supplying you with all information possible with regard to these negotiations in addition to the information contained in the reports and balance sheet concerning the general affairs of the company. You will understand, however, that at this stage, it is impossible for the Board to impart any information while the negotiations are still proceeding, and it is with a view to enabling the Board to afford you this information as soon as possible that the adjournment of this meeting is suggested. Should the negotiations result in an arrangement being arrived at, you will, of course, be called together in extraordinary general meeting to consider such arrangement and approve of it or otherwise. The matter is, however, in your hands, and in order to bring it to an issue, I now formally move: "That this meeting be adjourned to the 19th day of June next, at the same hour and place."

This was unanimously agreed to, and the meeting was accordingly adjourned.

NEW KLEINFONTEIN.

Increased Reduction Plant.

Liquidation of Liabilities.

The annual meeting of the New Kleinfontein Co., Ltd., was held in the board room, National Bank Buildings, on May 22, those present were Messrs. G. R. Airth, C. R. Pinder, W. J. Gau, E. H. Read, W. Ross, J. H. Ryan, A. G. Gill, F. E. Shaw, E. J. Way, consulting engineer, H. F. Webber, secretary, and G. W. Austin.

The Chairman, after reference to the death of Sir Julius Wernher, reported in another column, said:

In accordance with the decision come to by the board, that European shareholders should be given full opportunity of scrutinising the company's reports and accounts before arranging for their representation at the annual meeting, the directors' report and accounts for the year ended the 31st of December, 1911, were despatched from Johannesburg to all shareholders in the latter part of March, and this meeting is being held some time months later in the year than has been customary in the past. The reports deal with the operations of the company, and are now before you for your consideration. The usual reports from the consulting engineer and manager are annexures to that of the directors. I will commence by dealing with the accounts, and there are one or two matters in connection therewith which I wish to touch on. It will be seen that in the working expenses and revenue account, the charges under the headings: Mining and general expenses, are considerably in excess of those for the previous year.

Allocation of Charges.

As regards mining costs, the board decided that shaft sinking and development accounts should bear only the actual cost of breaking the ground and the necessary extension of rails. In other words, the proportion of supervision and subsidiary charges, such as pumping, hauling, tramming, etc., previously borne by development and shaft sinking accounts, is now charged against working costs, under the heading of mining. In the case of development costs the change has been introduced gradually, and in order to make it retrospective to the 1st January, 1911, it was decided at the close of the year to write off in the profit and loss account a further amount of £11,557 against the year's development. I may say that, though general expenses are higher than those for previous years, this does not necessarily in itself represent an increase, but merely a different allocation of the expenditure. These changes in system were made after very careful consideration by the board, and it is felt that, in placing the accounts as they now appear before shareholders, a clearer statement of the company's position is arrived at. You will notice an amount of £2,462 has been written off French Fiscal Taxes. This represents an accumulation of several years, and arises out of the method of taxation adopted by the French fiscal authorities, whereby the tax is assessed on an arbitrary basis, which does not necessarily bear any relation to the amount of dividends paid in France The company has made such deductions as are possible from the dividends so paid, and the above amount represents the balance which it has not been possible to recover. You will also notice that a further sum of £27,032 has been appropriated to meet capital expenditure, in addition to the loan negotiated with the company's bankers, which at the close of the year stood at £174,000. To this loan I will refer again later on.

Increased Reduction Plant.

The programme for the increase of the capacity of the reduction equipment is now nearing completion, and the plant will shortly be capable of treating up to 60,000 tons per month The expenditure involved in the whole scheme has exceeded the original estimates. The capital expenditure for the year amounted to £90,361, and the further expenditure to be met on this account during 1912 is estimated at £114,251; details of both these amounts are given in the report of the directors. Of this latter amount £52,742 has been spent, and there remain on the estimates: Shaft sinking (old mine) and excess development, £8,444; shaft sinking (Orient), £5,194; Orient general equipment, £9,411; power station (additional share), £11.982; increase in reduction plant, £15.864; electric winders, pumps and signalling balls, £8,795; general equipment, £1.819: total, £61.509. The total capital expenditure since January, 1910, when the first preparations for the extension of the plant were made, amounted on the 30th of April last to £252,950, a brief analysis of this being as follows: Orient section, shaft sinking, renovation of machinery and plant, etc., £54,382; shaft sinking and excess development in the old mine, £108,011; increase to the reduction plant, £41,577; electric installation, including share of power station, electric winders, compressors, pumps, bells, etc., £38,053: general equipment, £10,927; total, £252,950. You will see in the appropriation account that we brought forward a balance of £5,570 from 1910: to this was added the working profit for the year, amounting to £215,764, and of the total thus available £18,921 has gone to meet Government taxes; £4,127 was paid in interest; the directors' remuneration on the payment of the dividends in terms of the articles of association accounted for £2,000: £551 represented the levy made on this company by the Union Government in connection with the Miners' Phthisis Allowances Act, 1911: £2.643 was written off on account of French fiscal taxes; £11,557 was written off development account as mentioned above; dividends Nos. 11 and 15 accounted for £169,750: an amount of £27,032 was appropriated to meet certain capital expenditure, and the balance unappropriated, £14,753, has been carried forward.

Abolition of Gold Reserve.

At the close of the year, in deference to an expressed opinion that a gold reserve on the lines adopted on these fields was undesirable, the board decided to discontinue the practice. As, however, the report to shareholders for the quarter ended the 31st of December last had already been issued when the decision was taken, it was not possible to make reference to it in that report, but the value of the reserve at the close of the year, namely, £7,926, is included in the revenue account now before you. Of course the only object of the system, which was introduced many years ago, was to avoid, as far as possible, serious fluctuations in the declared monthly returns.

Revenue and Costs.

On reference to the directors' report you will see that the revenue per ton milled was somewhat in excess of that recovered for the year 1910, but, on the other hand, working expenses were considerably higher, and the ultimate profit per ton was 1s. 0.8d. below the previous year's figure, while, if the adjusting figure on the development account already referred to had been included in the expenditure and revenue account for the year, a further 6.1d. per ton would have been added, making a total difference of 1s. 6.9d. per ton milled. Among shares in other companies, an item, Kleinfontein Group Labour Organisation, appears. This is an organisation formed by the mines of the group on a co-operative basis, with a view to the concentration of their efforts to obtain native labour, instead of each company acting on its own initiative. This co-operation has in every way justified the effort, as it is satisfactory to note that we have been at least as successful as other organisations in the keen competitive struggle for native labour. Notwithstanding the comparatively satisfactory results achieved, it cannot, in our opinion, be maintained that the present competitive methods of recruiting native labour are in the best interests of the industry. I am glad to say that there have lately been evidenced on the part of most of the financial houses controlling the administration of the industry on these fields, indications of a desire to arrive at a "modus operandi" for bringing about a modification in the competition for native labour, which has, during the last twelve months or so, reached such an acute stage. It is needless to say that a satisfactory solution of this problem must inevitably be to the general benefit of all employers of native labour in South Africa.

Ore Reserves.

Turning now to the mining aspect, the total ore reserves at the close of the year amounted to 1,607,015 tons, of which 1,146,531 tons were payable, having an average assay value of 7.496 dwts. over a milling width of 43.91 inches. The payable ore reserves have thus been increased during the year by 89,131 tons, while both the average value and width show a slight improvement. The reasons for this improvement are dealt with in the manager's report. During the year an area equal to 10.63 claims was worked out This together wit hthe 66.63 claims to the end of 1910 gives a total of 77.26 claims exhausted up to the close of 1911. It is interesting to note that the profits distributed in Dividends 1 to 15 amounted in all to £1,226,125, equal to £15,870 per claim worked out. The tonnage mined amounted to 572,021, and of this 451,145 tons of ore were treated. The percentage sorted out was 21.18, as compared with 19.56 per cent. for the preceding year, and this increase, while improving the grade milled, naturally tended towards increased costs. It is as well to draw your attention to the fact that the percentage of sorting which is necessary in connection with the mining operations of this company is considerably higher than the average on these fields, and this is traceable to the fact that the gold-bearing sections of the reef are divided by bands of sandstone which cannot be evaded in the breaking process.

Development Values.

The average values disclosed by development during the first nine months of the year were disappointing, in that the improvement to which I drew attention at our last meeting was not maintained, and it was this fact which led your directors at the close of the year to decide on a reduction of the grade to mill for the time being. It is satisfactory to note that this fall in development values was, in the main, due to a temporary cause, viz., the inability of the management to open sufficient faces in the eastern section of the mine to allow of a fair proportion of development being done in this section. In addition to this the average grade was prejudiced by the abnormally low values from the development in the western section. It will be seen from the manager's report that a falling off in the grade of the upper main reef and leader in the eastern section, has been more than compensated by the improvement in the main reef development, and that the average from this section for the year was 8.27 dwts., as compared with 7.94 dwts. in 1910. In all the drives in the eastern subsidiary shaft, which have been extended into the Orient ground, ore of a high value has been exposed. The value of the ore developed in the central section was 8.61 dwts., which shows an improvement of 2 dwts. as compared with the previous year. The western section, which is practically free from mining difficulties, on the other hand, has unfortunitely given us very disappointing results, the average value of the year's development being only 3.95 dwts., representing a falling-off of over 2 dwts. as compared with the results for 1910.

Orient Section.

In the Orient section only a small tonnage on the south reef has been opened up. The vertical shaft at the end of April reached the projected plane of the main reef, and was still in dyke; sinking in the meantime has, therefore, been suspended, and boring commenced from the shaft in order to locate the exact position of the reef. With a view to expediting the opening up of this section, through the courtesy of the New Modderfontein Co., Ltd., one of that company's western drives is being extended through our eastern boundary, and it is hoped that we shall thus be enabled to accelerate the development of the main reef at this point. Shaft sinking has continued in all sections except the western, the respective footages for the year in the different shafts being: Eastern subsidiary, 520 ft. 6 in.; central, 493 ft. 6 in.; Orient vertical, 463 ft.; Orient incline (south reef), 101 ft. Since the close of the year the shafts have been advanced by: Eastern subsidiary, 173 ft. 6 in.; central, 253 fet.; Orient vertical, 107 ft. 6 in. I may say that, as the sinking of the central shaft is so advanced, it is contemplated that in two months' time it can be suspended for the year.

Latest Results.

I will now give you a brief resume of the development operations during the first four months of this year, together with the results for 1911:

Payable ore developed: During 1911: 59 per cent. 8.79 dwts. To end of April, 1912: 68 per cent., 10.85 dwts. Unpayable ore developed: During 1911: 41 per cent., 2.62 dwts. To end of April, 1912: 32 per cent., 2.39 dwts. Average: During 1911, 6.31 dwts.; to end of April, 1912, 7.74 dwts. This is quite encouraging, and shows an increase in the grade of ore developed to date of 1.4 dwts. as compared with 1911—mainly due to an increase in the value of the ore exposed in the eastern section. The values obtained in the lower stopes of the western section have been very disappointing, and in the majority of cases the faces have dropped to below the payable limit, compelling, for the time being, a restriction of mining operations in this section. Numerous dislocations encountered in the eastern and central sections have necessitated lengthy and expensive crossents. In previous years approximately one foot of crosscutting was necessary for every two feet driven on the reef, but at the present time the footage of crossents entailed is nearly equal to that of the drives. The disturbances referred to are caused by a series of semi-longitudinal upthrow faults, the reef being again displaced by dykes running nearly at right angles to the fault planes. Every possible precaution is being taken to combat phthisis. With the exception of shaft sinking, all blasting is done on the day shift, so that the mine has sixteen hours to clear of noxious fumes and dust before drilling by hand or machine is again commenced, the ventilation being further aided by special air rises, passes and stopings, and an effective water service. The reduction plant has been running smoothly, though, owing to the tonnage put through the mill being somewhat beyond the tank capacity, the extraction has not been all that could be desired. One of the first steps taken in connection with the increased crushing capacity was the addition of two Caldecott sands filter tables and ten slimes tanks. This part of the plant is now working, and should ensure the sands and slimes a longer, and consequently more effective treatment. Four tube mills have also been erected and are gradually being brought into commission, and there should be a substantial increase in the tonnage treated next month. The Kleinfontein Power Association has, for some time, been supplying current to your company, and the supply has been very satisfactory. The whole of the new installation will be driven from this source. Shortage of native labour during the latter part of the year necessitated the extended use of machine drills under conditions which in the Kleinfontein Company's mine, are much better suited to hand stoping. This undoubtedly assisted in increasing the working costs per ton milled, as also has the necessity for installing mechanical devices to clear the stopes of broken ground.

Taxation Legislation.

The tendency of legislation during the past year has been to increase in an indirect form the already somewhat onerous taxation on the mining industry, and in the case of a company like yours, the operations of which have been on a basis approaching 40,000 tons per month, every sixpence per ton in working costs means £12,000 per annum. It is difficult, taking all the varying conditions in a mine into consideration, to exactly assess what the increase in taxation means to you, but we feel we are on reasonably safe ground when we place the increase due to taxation and keen competition for native labour at one shilling per ton milled. I will now refer again to the bank loan, which, as already stated, amounted at the close of the year to £171,000. The ultimate liability of the company, when the present programme of capital expenditure is completed, after making allowance for about the usual amount of profits being diverted to capital account, will be in the vicinity of £250,000.

Liabilities.

The question of how best to deal with this liability which has been incurred directly and indirectly through the increase in the crushing capacity of your milling installation from approximately 40,000 to 50,000 tons per month, an increase of 25 per cent., has had the careful consideration of your board. As you will remember, the increase was decided on at the time the Orient property was purchased. Now there are four ways of dealing with this. The first is to, if possible, make a satisfactory arrangement with your bankers to pay off so much per annum. It is, however, recognised that this method is open to criticism, and shareholders' interests are liable to be prejudiced from the nature of such a transaction, where the company may be called on to refund the money at an inopportune moment. Then, secondly, you have the system of borrowing through the medium of debentures, which is an expensive and tedious way. Thirdly, you have the process of present shareholders foregoing dividends until the liability is paid off, which, in your case, would take, at the present rate of distribution, from eighteen months to two years, and I am sure will not appeal to the majority of present shareholders. The fourth method, and that which most appeals to your board, is to invite shareholders to take up an issue of shares at a moderate price, pro rata to their existing shareholding. If all shareholders take up these shares they will retain their pro rata interests in the company and will receive the benefit of any appreciation in the share value through the better returns which we believe will result from the increase of the reduction installation, an probably recover some of the depreciation to which share values have been subjected during the past two years. As I have said, the matter is at present under consideration, and your directors hope shortly to put forward a scheme which will meet with your approval, and enable the company to start on its larger scale of operations free from debt. You will notice that changes have taken place on your board through the resignations of Sir George Farrar and Sir Abe Bailey; these two gentlemen have been associated as directors of your company since its formation, in 1895—and a vote of thanks is due to them, more particularly in the case of Sir George Farrar, who, as chairman for many years, devoted his untiring energies towards the company's development; however, in the election of Messrs. C. R. Pinder and J. H. Ryan, who have acted as alternates to the gentlemen referred to, the same interests are represented, and I feel sure the company's affairs will be well looked after. Since the publication of the report, Mr. W. H. Dawe has resigned his seat on the board, and the vacancy has been filled by Mr. A. G. Gill. You will be asked to confirm these appointments. During the year the board has declared two interim dividends of 10 per cent. and 7½ per cent. respectively, of which your confirmation is requested. Since last we met, Mr. R. M. Torin, who, you will recollect, was then acting manager of your company, has had the appointment confirmed. The thanks of the company are due to Mr. E. J. Way, your consulting engineer, Mr. R. M. Torin, your manager, and to their respective staffs for the zealous manner in which they have carried out the work entrusted to them. I now beg to formally move the adoption of the reports and accounts before you, and the approval of the action of the directors in declaring interim dividends Nos. 14 and 15.

The appointment of Messrs. C. R. Pinder, J. H. Ryan and A. G. Gill as directors, in place of Sir George Farrar, D.S.O., Sir Abe Bailey, K.C.M.G., and W. H. Dawe, was confirmed; the retiring directors, Messrs. G. R. Airth and C. R. Pinder, were re-elected, and the auditors, Messrs. Diamond and English and C. L. Andersson and Co., were reappointed.

CROWN MINES.

Chairman's Review.

Annual Meeting.

A special general meeting of shareholders in the Crown Mines, Ltd., was held on May 23 before the annual meeting for the purpose of making a change in the articles of association. There were present Messrs. Samuel Evans (chairman), H. Mosenthal, R. W. Schumacher, W. Dalrymple, H. Eckstein, G. Sonn, C. Meintjes, A. G. Gill, M. Dold, B. Koenigsberg, F. L. Brown, D. W. Rossiter, Rev. A. Atkinson, H. C. Body, J. Berry, H. O. Mascall, J. E. Allingham, G. H. Darby, F. H. Barry, J. McW. Lyttle, H. J. McCormick, T. Munday, J. Blair-Hook, H. Daniel, F. Raleigh, and S. C. Steil and H. A. Read, secretaries. There were represented 963,699 shares out of the issued capital of £1,880,212.

SPECIAL MEETING.

The Chairman then proceeded with the business of the special meeting, and after the notice calling it was read, he said: As you are aware this meeting has been called to consider the advisability, or otherwise, of increasing the number of directors on the board from nine to ten. The object in view is to appoint an additional director to represent French shareholders. We know that a considerable portion of our capital is held in France. The position at the end of last year was this: Of the total issued capital of 1,880,212, shares, 504,406 are bearer shares, more than half of which, I believe, are in France. There are also registered over 50,000 shares belonging to French shareholders. Under the circumstances, it appears to me fair and in the interests of the company that the French shareholders should have another representative. I therefore beg to move:

That the maximum number of directors fixed at nine (9) by clause 80 of the company's articles of association, shall be, and it is hereby, increased to ten (10).

The motion was carried, and the chairman announced the receipt of a number of proxies against, which would be recorded.

ANNUAL MEETING.

The annual meeting was then held, and after the usual preliminaries, the Chairman said:

The Chairman, in moving the adoption of the report and accounts, said:

As the reports and accounts have been in the possession of shareholders for some time it is hardly necessary for me to-day to deal at length with the results obtained last year. You will observe that there is an increase of

192,598 in the tons mined.
104,500 in the tons milled.
£83,882 in the working profit.

There has been practically no chance in the grade of the ore mined, but there is an increase per ton milled of 1s. 3d. in the yield and of 1s. 2d. in the costs. The advance in the yield is due almost entirely to closer sorting. I shall refer to the costs presently. For the first four months of this year there is an improvement in the profits from current operations of nearly £26,000, compared with the corresponding period of last year.

Adverse Influences.

This year, however, particularly in March and April, there were exceptional circumstances which influenced the profits adversely. There was an unusual fluctuation in our unskilled labour force; a large number of experienced boys left, whilst the influx of raw, untrained natives was considerable. The net result of these changes is a substantial increase in our labour force, from which we shall eventually benefit, but the immediate effect was a lowering of the efficiency and an augmentation of the working costs. I may say that we have at present a larger number of natives in our compounds than we have ever had, and this should soon begin to tell on the tonnage. At the end of last month we had registered on our books 14,090 natives, as compared with 12,158 at the end of 1911, 10,621 at the end of 1910, and 10,181 at the end of 1909. We have in our employ 2,249 tropical natives, and until quite recently we had been particularly fortunate in maintaining them in a healthy condition, the average death-rate of the seven months ending March 31st being 27.5 per 1,000 per annum, for a force averaging 1,616 in strength.

During the fourteen months that have elapsed since our last annual meeting the company has been subjected to a certain amount of criticism directed mainly to two points. In the first place, it has been stated that the promises made prior to the amalgamation have not been fulfilled; and secondly, it has been urged that the shareholders, or at any rate some of them, would have done better had there been no amalgamation. I propose to-day to compare the results obtained by the Crown Mines with the estimates framed and with the combined achievements of the separate companies prior to the amalgamation.

Ore Reserves Values.

I will commence with the ore reserves. At the annual meeting of the Crown Deep on the 8th of April, 1909, Mr. Reyersbach explained the terms of the amalgamation, which had not then been agreed to by the shareholders. On the subject with which I am now dealing, he said: "These reserves should gradually be increased to from six and a half to seven million tons, principally in the western section. In consequence of such development, the value of the reserves will gradually be decreased to about the average assumed for the whole tonnage—that is, a little under 7 dwts. mine grade. I mention this to-day as I wish to make it quite clear that shareholders need not be alarmed if in future annual reports lower values are assigned to the reserves." "For the first few years," said Mr. Reyersbach on the occasion referred to, "the yield is estimated at 29s. 10d. With 15 per cent. sorting, 29s. 10d. calls for a mine grade of approximately 6½ dwts. From the reports of the consulting engineer and the general manager you will have gathered that the company's payable ore reserves at the end of last year were estimated at 10,124,072 tons, having a value of 7.25 dwts. per ton, to which has to be added 1,250,000 tons approximately of ore on which no further development is necessary, but which for the present cannot be valued. Now, I take it that what is of supreme importance to shareholders is the total value of the recoverable gold contained in the payable reserves, and in that connection I think the following little table is distinctly instructive. It is based on an assumed extraction of 95 per cent.

PAYABLE ORE RESERVES.

Date. Dec. 31st.	Tons.	Total value of recoverable gold contents.
1907	3.490,086	5,918,313
1908	4,104,006	6,462.270
1909	3,916,593	6 087,170
1910	6.282,719	9,639,260
1911	10 124,072	14.816.326
Estimates mentioned in Mr. Reyersbach's speech, 8/4/09	6,500,000	8,527,675
	7,000,000	9,103,650

On the basis of only 14s. profit per ton milled, and leaving altogether out of account the 1,250,000 tons of ore which require no further development, we have in sight a profit of over £6,000,000, as compared with a profit of between £3,867,000 and £4,165,000 foreshadowed by Mr. Reyersbach. That is, the profit in the developed ore reserves of the Crown Mines is over 50 per cent. larger than the total of the dividends paid by the Ferreira Gold Mining Company during the twenty-two years of its very successful existence, and is nearly equal to the total of the dividends paid from the commencement up to the time of the amalgamation by all the companies that are now incorporated in the Crown Mines. I am sure shareholders will agree with me in considering that the figures I have quoted prove conclusively that as regards the most important of all matters connected with mining ventures the estimates framed at the time of the amalgamation were very conservative.

Capital Expenditure.

The next subject with which I propose to deal is that of capital expenditure. Mr. Webber, in his report of the 1st of January, 1909, anticipated that the enlarged company would have about £721,000 available cash, which would be absorbed by capital expenditure on the completion of the South Rand shaft, additions to the reduction plants, concentration of mining operations underground, the centralisation of offices, workshops, etc., on the surface, transfer fees, and other payments in connection with the amalgamation. However, it became clear soon after the middle of 1909 that, in order to work the combined areas to the best advantage as one mine, we should have to incur a larger amount of capital expenditure than had seemed necessary when the scheme was at first outlined. I dealt very fully with this question at the annual meeting last year. Briefly this is how the matter now stands: When the amalgamation programme is completed, we shall have a debt on account of capital of approximately £900,000. At the end of June next there will also be due to a special suspense account an amount of rather more than £300,000, the cost of advance development, and which will gradually be paid off out of profits. You will observe that it represents approximately one shilling per ton on the net increase in the quantity of payable ore.

In my speech last year I detailed the reasons why the capital expenditure estimates framed at the end of 1908 and the beginning of 1909 had been exceeded. These reasons are:

1. The capacity of the reduction plant has been increased by over 500,000 tons per annum beyond what was originally contemplated, and there has been a proportionate increase in the scale of the entire equipment both on the surface and underground.
2. There have been numerous items of capital expenditure which have had to be met, but which could not have been foreseen at the beginning of 1909.
3. The cost of enlarging and renovating the old reduction plants proved more expensive than was estimated.
4. The cost of several of the larger items, such as the two new crusher stations was originally considerably under-estimated.
5. The labour shortage, the delays connected with the delivery of plant and machinery, the inability of the Rand Mines Power Supply Company to provide electricity and air within the time originally agreed on, etc., all helped to swell capital expenditure.

I may say that no subject in connection with the Crown Mines has received more careful and more constant attention than that of capital expenditure. As I have already mentioned, our debt on this account will amount to approximately £900,000 when the amalgamation programme is completed. Hitherto we have borrowed from the Central Mining and Investment Corporation and the Rand Mines on current account such funds as we required, paying interest at the rate of five and a half per cent. on the actual amount due. The arrangement is a satisfactory one from our point of view, as it gives us the full benefit of the profits and profits tax in hand up to the time they are distributed. It is clear, however, that as far as the Central Mining and Investment Corporation and the Rand Mines are concerned the arrangement is not one that can be continued indefinitely, as they cannot be expected to tie up their funds for a prolonged period on conditions such as those mentioned. Moreover, we are now in a position to gauge our financial requirements fairly accurately, and we have therefore to decide on the best course to adopt as regards the future.

Debenture Issue.

A variety of plans have been carefully considered, but a proposal on the following lines as regards its essential features would appear to be the most satisfactory: The creation of £1,000.000 five per cent. debentures to be offered for public subscription at 97½ per cent.; in the allotment preference to be given to the shareholders of the Crown Mines and the Rand Mines; the issue to be guaranteed by the Central Mining and Investment Corporation and by the Rand Mines, Ltd., for a commission of three per cent.; the debentures to be repaid at 103 per cent in eleven annual instalments of £85,000 each, and a final instalment of £65.000, the first instalment to be repaid on the 1st of January, 1915. Full details of this proposal will be communicated to shareholders by circular, and it will be considered and decided upon at a special general meeting, which will be held probably on the 30th of August next. You will observe that the arrangement proposed leaves us free to deal with our reserve shares if found desirable at a time when the results from the mine are reflected in a higher level of prices than that which has recently prevailed. The system of financing suggested will, of course, be more expensive to the company than the present form of borrowing the money on current account, but, as I have said, it is obvious it would be unreasonable to expect the Central Mining and Investment Corporation and the Rand Mines to continue to hold large sums of money at the disposal of any one company on conditions which cannot be considered attractive. It is true that the two corporations mentioned hold a predominant interest in the Crown Mines, and I am sure our other shareholders appreciate the handsome manner in which they have acted towards the company in the past two years. On the whole, I believe shareholders will agree with the directors in considering the plan proposed the best that can be devised under the circumstances. I am sure they will also agree that the debt need not cause any anxiety when it is remembered that the company has nearly fifteen million pounds' worth of recoverable gold in its ore reserves, and that it is in a position to mine at the rate of about 3,000,000 tons per annum, provided the requisite supply of labour and power is forthcoming.

Average Monthly Profits.

The third point to which I wish to refer is that of the profits earned since the amalgamation. The actual profit earned from current operations has averaged per month:

July 1 to December 31, 1909 ..	£97,655
1910	£98,279
1911	£107,779
January to April, 1912	£106,436

The combined monthly profits of the individual companies averaged during the five years ended December 31st, 1908, £87,750; the average monthly results achieved in each of the five years referred to being: 1904, £55,523; 1905, £73,692; 1906, £85,386; 1907, £101,562; 1908, £122,584. The net monthly profits foreshadowed in the statement submitted to shareholders prior to the amalgamation were £108,000 to £109,000 at first, and £116,000 to £117,000 after the milling capacity had been increased to over 2,000,000 tons per annum. The following table will enable shareholders to note where the actual results (excluding profits from accumulations and from the treatment of the dump) differ from the forecasts and from the previous records of the companies forming the Crown Mines:

	Average Results of 5 years ending 31/12 08.	Estimates framed in Jan., 1909. of position after completion amal. programme.
Tons milled per month ...	91,425	166,000
Percentage sorted out ...	10 8	15
Total profit per month	£86,000	£116,500
Per ton milled—		
Yield	38/7	29/10
Costs	19/8	15/9
Profit	18/11	14/1

	1910	1911.	First Four Months. 1912.
Tons milled per month	126,166	134 875	152,100
Percentage sorted out	8.3	11.7	12 7
Total profit per month	£96,760	£106,975	£106 038
Per ton milled—			
Yield . . .	33/5.7	35/1.7	32/8
Costs . .	18/1.6	19/3.4	18/9
Profit	15/4.1	15/10.3	13/11

The striking difference between last year and the forecasts made prior to the amalgamation are a shortage of tonnage of approximately 380,000, and higher grade and higher costs by 5s. 3.7d. and 3s. 6.4d. respectively. That is, the profits per ton last year were 1s. 9.3d. better than the estimate, so that had there been no loss in tonnage the total profit would have exceeded the anticipations.

Questions Answered.

I take it that on the facts mentioned shareholders would desire to have the following questions answered:

1. Why has the tonnage crushed been below the estimate?
2. What are the reasons for the costs last year exceeding the original forecast?
3. Is the mine not being overworked having regard to the grade called for by the payable ore reserves?
4. Would not shareholders, or at any rate some of them, have been better off had the amalgamation not taken place?

Now, let us carefully examine these points.

1. The main reason for the shortfall in tonnage is the shortage and inefficiency of native labourers. Ever since the amalgamation the company has had considerable spare crushing capacity which could not be utilised for want of labour. There are other factors which have also had an adverse influence on the quantity of ore treated such as the insufficiency of power, troubles with the old shafts, and particularly with No. 1 shaft, occasioning numerous stoppages of the haulage of ore from the Robinson Central Deep and Crown Deep sections. I would point out that of the three unfavourable factors mentioned, two—labour shortage and troubles with the old shafts—would have had an equal—probably a greater—adverse influence on each of the individual companies, supposing there had been no unification, and that they had continued their separate existence. As I have already stated, there has been in the last few months a marked improvement in the labour position. Unfortunately, a large portion of the increase is composed of tropical natives, who are slow in acquiring efficiency and who have higher sickness and mortality rates than Kaffirs recruited in South Africa south of latitude 22deg. Of course, the termination of capital expenditure work is gradually releasing men, who can be used for the production of ore for the mills. It is certain that as soon as the 13th level and the South Rand shaft are in commission we shall be able to handle a larger tonnage with a smaller number of boys than has hitherto been the case. Also, we shall then be at the end of our troubles with the old shafts. As regards power, the Rand Mines Power Supply Company is increasing its plant, and it seems reasonably certain that before the end of the present year they will be able to meet our full requirements.

2. The average working costs per ton milled of the Crown Mines and its component companies have been

1904	22s. 11.2d.
1905	21s. 10.3d.
1906	20s. 11.9d.
1907	19s. 9.4d.
1908	16s. 0.5d.
1909	15s. 11d.
1910	18s. 1.6d.
1911	19s. 3.4d.

That is, in the four years ending December 31st, 1908, there was a reduction of 6s. 11d. in the working costs per ton, whilst in the past two years there has been an increase of 3s. 4d., which is, I might observe, confined almost entirely to the underground operations. There are a variety of reasons to account for the recent increase:

Increase in Charges.

Both the wages and the recruiting expenses of natives are higher than they were in 1908 and beginning of 1909.

The 1911 accounts include payments for work which was not done at all, or not considered necessary prior to the amalgamation, such as, sand filling, artificial ventilation, water spraying underground, etc.

Our power bill has been, and is still unduly high owing to the inability of the Power Company to meet our full requirements. I confidently anticipate the cost of power per ton treated will be substantially reduced as soon as we are relieved of the necessity of running our own steam plants to supplement the electric power and compressed air purchased from the Rand Mines Power Supply Company.

In the last two years we have had to face charges of an abnormal character, due entirely to the transition stage, and which will to a large extent, if not entirely, disappear after the completion of the enlargement programme. For instance, shaft maintenance has been a particularly expensive item, on which there should be considerable economy when we are using two up-to-date, and well equipped shafts instead of seven, several of which call for constant repair.

An important portion of the underground expenses in our case is due to measures, the cost of which has been more than counter-balanced by the improvement which they have brought about in the grade. In this connection, I would point out that:

Closer Sorting.

(a) We sorted last year 11.7 per cent. as compared with 8.1 in 1909, which would account for an increase in the costs of approximately seven pence per ton milled, and

(b) The stoping widths have been decreased, particularly in certain sections, and we are hauling from the mine a smaller proportion of low grade ore which is cheap to extract. At the time of the amalgamation only about 55 per cent. of the ore mined came from the reserves, whilst about 39½ per cent. came from the Main Reef and other outside sources of rather a low grade, the mining of which was comparatively cheap, but which yielded very little profit, whereas during the past year 82 per cent. of the ore mined came from the ore reserves, and only about 11½ per cent. from the outside sources referred to. Rock from development faces has not been included in the figures mentioned. The percentage from this source has only increased from 5½ to 6½ per cent., notwithstanding the very large increase in the development footage, the lower grade rock from the development faces having been discarded.

3. I dealt with this question rather fully in a letter dated December 13th last (which was published) in answer to a communication I received from one of our shareholders. As I then said it was anticipated at the outset that for some time after the amalgamation the ore mined would have to be of higher value than the average of the reserves, simply because we had to use the shafts, roadways and stoping areas which each of the separate companies were using. There was no choice in the matter, and as a result an undue

proportion of the ore mined came from the eastern side of the property. For example, 24 per cent. of the tonnage mined last year came from the Robinson Central Deep, whereas the ore reserves of this section only represent about 19 per cent. of the total reserves. This is a condition which is being rectified in the only way in which it can be properly rectified, that is, by increasing the scale of operations of the whole mine while continuing to take the same tonnage as at present from the eastern section.

Advantages of Amalgamation.

4. As regards the fourth question, I should like shareholders who were interested in the companies that went to constitute the Crown Mines, to consider for a moment the probable present and future prospects of their investments, supposing the amalgamation had not taken place, and that the individual companies had continued operations until all the payable ore in their areas had been exhausted. Apart from such windfalls as the discovery of new ore bodies, the life of a Rand mining company working on a given scale, the recognised payable reefs is strictly limited, and can only be prolonged in two ways, namely, (1) lower working costs, enabling ore to be treated which would otherwise remain unpayable, and (2) the acquisition by purchase or by fusion with other companies of additional intact claims, and the expenditure of capital on the equipment and development of such claims. We adopted the latter course, and the enlargement of the scale of production should eventually enable us to secure the benefits of both courses. Our policy, has, it is true, involved us in considerably more expense than we had anticipated, but I believe that a close examination of all the facts of the situation will conclusively prove that the policy of letting well alone or any other course other than that which we have followed, would have meant a much smaller ultimate profit to all our shareholders. At the beginning of 1909 the position of our crushing mines was approximately:

Crown Reef, monthly profit about £17,000, life about 2 years.

Robinson Central Deep, monthly profit about £45,000, life about 4 years.

Crown Deep, monthly profit about £36,000, life about 15 years.

Langlaagte Deep, monthly profit about £19,000, life about 18 years.

When the profits mentioned were being earned the labour supply was efficient, cheaper than at present, and up to the requirements of the companies. There has been a severe shortage since and the quality of the labour available has deteriorated, whilst its costs has increased. I think I can safely say that the inadequacy, inefficiency, and higher expenses of the labour supply in the last two years has not only caused a serious loss of tonnage, but has also led to a general increase in the working costs. Besides having an adverse effect on the lives, this increase, together with the exhaustion of the Crown Reef, would already have reduced the above profits to £90,000 per month, with the certainty as the Robinson Central Deep and the richer portions of the Crown Deep became exhausted of a further gradual reduction to under £50 000 per month by 1914. There was only one way of avoiding such a result, and that was by a heavy expenditure of money on the development and equipment of the virgin ground acquired through the amalgamation, that is, the southern and western areas. Now, in addition to making good the loss of the Crown Reef mine, and maintaining the level of profits—allowance being made for the general advance in costs—we have increased our payable ore reserves, measured by the value of the recoverable gold contents, from £6,000,000 to nearly £15,000,000.

Completion of Programme.

Soon after the middle of this year we shall have completed the scheme of re-organisation and consolidation planned in 1909, and in time this should enable us to derive the fullest benefit both underground and on the surface from large scale production under one centralised administration. I have already explained the position of our ore reserves. I have to add that we have in readiness sufficient stoping faces so that, provided we have the labour and the power, the ore required to feed all our plants to their fullest capacity (212,000 tons per month) can be broken without any further preparatory work. Instead of employing seven shafts as in the past, we shall be in a position to do all the necessary hauling through two shafts—No. 5 and No. 7. The latter, which has a hoisting capacity of 5,000 tons per shift, is already working and giving every satisfaction; No. 5 shaft is nearly ready, and it will have a capacity of 6,000 tons per shift. At a depth of 2,000 feet these two shafts are connected by a straight drive fifteen feet wide, which will be served by electrical haulage so arranged that ore may be delivered in train loads to either shaft. Eventually, this drive will be about three miles in length from the eastern to the western boundary of the property. Already about two-thirds of the distance has been completed, and will be working in July or August next. This drive is the largest undertaking of the kind on the Rand, and, should any of our shareholders care to inspect it or any other portion of the mine, I shall be very pleased to make arrangements for them to do so. It will be the main roadway through which the bulk of the ore broken in the Crown Mines for many years to come will be carried. On the surface our plants have been strengthened, re-constructed, and added to, so that we are to-day in a position to crush 46 per cent. more rock than was the case in June, 1909. A system of surface haulage has been established, which will enable us to transport the ore in trains from either of the two shafts to any one of our large mills. The electrification of our plant has been practically completed, and we are in a position to entirely dispense with steam as soon as the Power Company are able to fully satisfy our requirements, which, I believe, will be the case before the end of the present year. The large crusher station erected at No. 7 shaft was completed ten months ago and is working splendidly. When the large crusher station at No. 5 shaft is in working order at the end of July or the beginning of August next, we shall have practically finished the amalgamation programme. It may take two or three months to get the whole of the new organisation on to a settled and smooth running basis. When that is accomplished, and provided we are not badly disappointed regarding unskilled labour, we shall have done all that can be done to insure a substantial increase in our profits, and to create a state of stability and durability as regards future results, which has hardly ever been achieved by a gold mining venture.

Before concluding, I wish to place on record an expression of our indebtedness to Mr. Warriner and his assistants, Mr. Brett and Mr. Pitchford, for the excellent work which they are doing for us, often under very trying and difficult circumstances.

Mr. Schumacher Seconds.

Mr. Schumacher said the Chairman has dealt with the affairs of this company in a masterly manner, and I can give you little further information. I only say that if, after having heard or read the Chairman's speech, shareholders still have doubts about the advantages of the Crown Mines amalgamation, or about the future of this Company, they should reserve their final judgment until the latter part of this year. The stupendous task of re-equipping and reorganising the whole property will then have been completed, and the results that will be obtained will indicate the measure of success that can be expected. In other words, you will then have the final proofs. Shareholders will, I know, agree that the proposed issue of £1,000,000 of debentures is a sound step; it consolidates the company's debt, and should tend to render an increase in the dividend distributions more easy. As already stated, shareholders will be given every opportunity to apply for these debentures. I beg to second the adoption of the reports.

Shareholder's Anxiety.

Mr. Daniel said he was one of those shareholders who acquired shares at the time of the amalgamation in 1909, relying entirely on the statement made at the meeting in April of that year, when the Chairman had said that the company would be in a position to pay shareholders at the rate of 130 per cent. At that time he (Mr. Daniel) reckoned he would get 8 per cent. on his outlay; he was not speaking about the market prices of the shares to-day, but he had only got 7 per cent. They knew they would get figures at that meeting, but he, as a shareholder, had to look at the dividends, and he regretted to have to say he had been sorely disappointed. What he should like to know was when they expected to go back to the promised rate of dividend.

The Chairman: I am sure we have been as much disappointed, and probably more so, than Mr. Daniel. Of course you must remember that all the statements that were made at the meeting at the time of the amalgamation were subject to the condition that the labour position did not get very much worse. It did get very much worse; but, there had been a very considerable improvement in the last few months, and I think we are justified in the hope that this will be reflected in the profits and also in the dividends. Of course I can only prophesy, subject to the labour position continuing fairly satisfactory. I do not want a surplus of labour but if we can maintain a fairly satisfactory poistion I am quite sure none of the shareholders who were interested in the individual companies will have reason to regret the amalgamation. I am quite sure if Mr. Daniel made a careful investigation to-day of his position he would find that he is better off than he would have been if there had been no amalgamation. I do not wish to leave you under the impression that dividends are going to be less. I feel certain that with a favourable labour supply all the promises made are going to be more than fulfilled. That is my feeling in the matter, and I probably know more about it than anybody.

Mr. Daniel: You are referring to the 130 per cent.?

The Chairman: Yes.

The motion for the adoption of the report and accounts was then carried unanimously.

Messrs. E. A. Wallers and H. A. Rogers were re-elected directors. Messrs. C. L. Andersson and Co. and Howard Pim were re-elected auditors, and their remuenration for the past audit was fixed at five hundred guineas each.

The proceedings then concluded.

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Notes and News.

Mr. Schumacher's City Deep Scheme.

We print elsewhere a report of the important speech made by Mr. R. W. Schumacher at the City Deep last week, announcing the details of the housing scheme the directors of that mine are introducing. The idea has everything to commend it. As a generous recognition of the employers' duty towards their men, it is, on the lowest ground, "good business" for all concerned, and we look forward to the excellent example of Mr. Schumacher and the directors of the City Deep affording the other mines of the Rand a precedent for increasing attention to the comfort and well-being of their employees.

* * * *

Shareholders' Apathy.

At the Government Areas annual meeting, Mr. G. Imroth made a pardonable reference to the apathy of the European shareholder, as evidenced by absence of their representation from recent meetings. He said he took the opportunity to point out that, in spite of the facilities given to European shareholders to be represented at the meeting, and though there had been eight meetings of companies of his group that day, scarcely a single European shareholder had been represented. He asked if he might assume that that apparent apathy was due to the fact that the European shareholders were so satisfied with the management of the companies that they did not consider it necessary to be represented? For answer, we can think of no valid reason why Rand directorates should not take the flattering unction to their soul.

* * * *

The Revised Miners' Phthisis Bill.

According to reports from Capetown that reach us as we go to press, the Miners' Phthisis Bill has been altered nearly out of recognition by the Select Committee. A distinction is made between "present sufferers" and "future." In the former category are included all persons who lodge claims for compensation within the two years next following the coming into operation of the Act. To meet such claims the Government is setting aside one hundred thousand pounds from the bewaarplaatsen revenue. This, of course, will not cover anything like the probable call on the fund, and in respect of claims arising within the two years' period, the employers have to meet the whole cost by means of a levy made on them in proportion to the average number of miners employed per month by such employer during the preceding three years. The Bill sweeps away the fixed contribution and creates a phthisis insurance fund to which, after the Act comes into operation, each underground worker must pay sixpence in the pound of his monthly earnings. The employer has to provide an equivalent sum during these first two years; after that time he must subscribe towards the fund at the rate of one shilling and sixpence in the pound on all amounts paid by him to white employees underground. The men do not pay directly. Their sixpence is deducted by the employer from earnings during the first two years, and the worker's share of the contribution after that period drops to one-third, so that he will go on paying his sixpence as long as he remains an underground worker. The scale of benefits is also slightly altered. The acute case can claim his eight pounds a month for a year. The less affected case may recive eight pounds a month until he has recived in all £400, which is his limit. Should he die in the meantime his widow and dependents can receive whatever may be the balance between his drawings and the gross sum of £400. The Board also may pay out that balance in a lump sum to the miner who wishes to commute his annuity. We hope to be able to deal with the Bill at greater length next week.

Rand Klip.

An official statement issued by the Rand Klip, Ltd., on Thursday, states that in cleaning up the last blast banket was met with. It is impossible to say what this is until footwall shale is reached.

* * * *

Lancaster West Fire.

The fire that destroyed the old wooden headgear at the Botha shaft of the Lancaster West last week is not likely to entail any financial loss to the company. The headgear, which was completely destroyed, was insured, and, should it be decided to again make use of the shaft—a not improbable contingency—a new steel headgear can be erected out of the insurance recovered. The damage to the interior of the shaft is not yet fully measured, as the skip fell sideways down it and stopped at a depth of approximately 100 feet, choking the shaft with debris, and, luckily, preventing the fire from descending. The Cornish pump, however, was saved. The latest reports from the mine point to an improved return for May, and profits will show an increase on April.

* * * *

A Question of Title.

Our attention has been drawn to a circular referring to a publication entitled "The South African Mines and Rhodesian Settlers' Guide," or "Mines of South Africa and Rhodesian Settlers' Guide." Owing to the similarity of title with the second name of this journal, "The S.A. Mines, Commerce and Industries," it may be well to draw the attention of the public to the fact that the publication in question has no connection, either directly or indirectly, with this paper or with any member of its staff.

* * * *

R.S.M.

Royal School of Mines students have been circularised with a view to reviving the annual dinner. It is proposed to hold the dinner on Wednesday, the 12th of June, the day on which the Royal School of Mines annual dinner is to be held in London. Place and time will be announced later. Past students are particularly requested to communicate with Mr. Hans Meyer, Central Mining and Investment Corporation, Box 149, Johannesburg, in connection with the proposed function.

* * * *

Tin in Rhodesia.

The reported discovery of cassiterite near Selukwe in Matabeleland serves to direct increased attention to the tin-bearing and tin-producing possibilities of Southern Rhodesia. The present high price obtaining for the metal should stimulate search the world over, and although up to the present practically nothing has been established in Rhodesia beyond the fact that cassiterite does occur there, it may be that, as in the Transvaal, some few years will be spent in proving the occurrences before anything in the real nature of an industry results. To date the existence of tin stone has been determined in three or four widely-separated areas, notably in the Arcturus, Abercorn and Victoria districts of Mashonaland. The sister province of Matabeleland appears also to possess indications of cassiterite, and further information regarding its reported discovery near Selukwe will be awaited with much interest. Should the mineral have been found in the locality stated, there should be no difficulty in rapidly determining the extent and value of the deposit, as the Selukwe mining area is well served by the branch railway from Gwelo. No doubt further discoveries of cassiterite will be made in Rhodesia as the country becomes further prospected and opened up. Both in the Southern and Northern territories the geological conditions existent in certain localities are ideal for the occurrence of cassiterite.

* * * *

"Low Veld" Prospecting.

Numerous prospecting parties are preparing for a busy season in the Low Veld this winter. The continuation of the line northwards from Pietersburg towards the Limpopo, and the construction of the Selati railway, have rendered many known mineralised localities accessible which in the past were only reached with great difficulty. Stores and supplies can now be got up to the most remote parts of the Zoutpansberg at a reasonable cost, and it is understood that something in the nature of a revival in the extreme northern districts of the Transvaal is pending. Attention will also be devoted to the copper and mica deposits lying along the Portuguese East African-Transvaal border, and also to the mineral areas situated just over the frontier in Portuguese territory.

* * * *

Modder Deep Shaft Sinking.

Owing to the unsurveyed boreholes on the Modder Deep having deflected more than allowance had been made for, it is now expected, from data gained by boring from the bottom of one shaft, that the reef will not be struck at the time anticipated. It will be remembered that, at the annual meeting held some little time ago, the Chairman stated that he expected the reef to be struck about the end of June. It is now known that the event cannot take place until some weeks later. The extra sinking, however, will not involve the company in expense beyond that originally contemplated for shaft sinking, as the amount required will be met out of the sum already saved by economies in sinking. The reef, apparently, is dipping at a steeper angle than the old boreholes indicated, and precisely the same tendency is bound to characterise its behaviour in the adjoining Government Areas—referred to by the Chairman at the annual meeting reported in full elsewhere in this issue.

* * * *

Labour Competition..

On Thursday afternoon a meeting of the groups was held to consider the contemplated fusion of recruiting agencies in Union territory. The decision arrived at has not yet been made public, but it is understood that very little now stands in the way of complete agreement between the "houses." Many difficulties, of course, militated against the introduction of the proposed abolition of competitive recruiting. There was the question of compensation to the recruiting agents for the unexpired periods of contracts. A scheme for pooling the native labour force was suggested, but the well-supplied mines naturally objected to surrendering a proportion of their "boys." Moreover, shareholders in the more profitable properties rightly objected to the transfer of labour to poorer concerns. Certain groups claimed that individual recruiting had effected remarkable results numerically, although at an excess cost of 2d. per shift. They were disinclined to jeopardise the maintenance of the present standard of profits for the sake of an estimated economy of £150,000 a year on recruiting for the field generally. Such critics agreed on the necessity of a standard schedule of native wages for surface and underground work, particularly as in many instances the former was paid better than the latter.

* * * *

Miners' Phthisis in Cornwall.

Dr. J. S. Haldane, F.R.S., has analysed the health returns obtained from the sub-registrars of the Redruth registration districts. Dr. Haldane remarks: "Since 1907 there has been a substantial and progressive decrease in the deaths from lung disease; and there seems to be every reason for believing that the regulations introduced in 1905 for the prevention of miners' phthisis are now telling markedly on the very heavy death-rate from this disease. These regulations were more particularly directed towards the prevention of dust inhalation in rock drill work, and special interest attaches to the returns of deaths among men who had worked rock drills in Cornwall only. It will be seen that there were eight deaths (all from phthisis) among men who had worked rock drills in Cornwall only. On examination of the records by the registrars of the work done by these men, it appears that five had only worked rock drills before 1905. Of the other three, one had worked for 15 years with drills—*i.e.*, almost entirely before 1905. In the case of the other two, the period at which the work was done is not definitely stated, but seems to have been either wholly or partly before 1905. No death can thus be attributed to work with rock drills since 1905. It will also be seen that the average age at death (49) of the men who died was ten years greater than a few years ago. Of the ordinary miners who had not worked rock drills, 23 out of 47 had died from phthisis, and of these 23, 15 had worked abroad, though only three had worked entirely abroad. A considerable part of the heavy death-rate among the ordinary miners must thus be attributed to work abroad, and it is evident that more than half of the deaths (all, without exception, due to phthisis) among the rock drill men were due to work abroad. It is to be hoped that the fall in the death-rate from phthisis will act as a further stimulus and encouragement to mine officials and miners to adopt every precaution against the inhalation of dust, in whatever way it may be produced. Apart from the avoidable danger of dust inhalation, metalliferous mining in Cornwall appears to be a perfectly healthy occupation."

* * * *

Central Mining Investments.

The report of the Central Mining and Investment Corporation is accompanied by a report by the consulting engineer, Mr. Hugh F. Marriott, dealing briefly with the Rand properties under the Central Mining control. The group, managed either directly or through the Rand Mines, Limited, comprises sixteen companies, which together produced, in 1911, 33·8 per cent. of the total tonnage milled by the Witwatersrand mines, 39·7 per cent. of the total yield, paid 36 per cent. of the total costs, earned 46 per cent. of the total profits, and distributed 52 per cent. of the total dividends. As compared with 1910 the mines of this group earned £340,000 more profit, but distributed £200,000 less dividend, which is partly due to the fact that working profits were being invested in improvements, and partly to the fact that the Bantjes, City Deep and Modderfontein B companies increased their total profits from £12,500 in 1910 to £225,000 in 1911, but have not yet entered the dividend list. Mr. Marriott's remarks on the three new producers and on the Village Deep are of special interest. The Bantjes mill started in August, 1910, and during the five months to end December milled 97,872 tons for a revenue of 25·41s. and a working profit of 2·58s. per ton milled. During 1911 the mill crushed 273,212 tons, the revenue rising to 27·48s. and the working profit to 4·12s. After allowing profits tax (0·5s.), there was a nett profit available for dividends or for expenditure on improvements of 3·62s. per ton milled. No dividend was paid, as a portion of the expenditure on opening up and equipping the mine had to be paid for out of profits. This has now been done, the company is free from debt, and Mr. Marriott says that it should be able to pay a dividend this year. The City Deep during the year milled 349,913 tons for a working profit of 7·50s. per ton. Many minor difficulties attended the initial year's operations, and progress has also been hampered by the inefficiency of the labour force in the mine. The returns are now improving, the profit thus far made in the present year being nearly double the average rate for 1911. Mr. Marriott, however, makes no remark concerning the dividend prospects. The company has 1,442,902 tons of ore of a grade of 34·42s. blocked out and available for stoping, but more ore was stoped last year than was developed, the reduction in the reserves amounting to 335,759 tons. Crushing at Modderfontein B began in September, 1911, and the results to December 31 showed a working profit of 16·50s. with a net profit available for dividend of 14·8s. per ton. The plant here is working to its full capacity of about 31,000 tons per month. The yield is of 37·30s. higher than the indicated average of the total reserves, which are calculated as 2,355,700 tons, of an average gold content of 31·87 per ton. Mr. Marriott says that it is impossible at present to work to the grade of the mine without detriment to economy, and that the monthly yield may be subject to considerable fluctuation. The company at December 31 had a net cash liability of £110,000. The capital expenditure in connection with the present plant is nearly completed, and the debt should be liquidated by about the middle of the present year. The references to the "present" capacity of the plant are noteworthy. The Village Deep in 1910 earned a working profit of 6·07s. per ton milled, but in 1911 the working profit rose to 8·66s., with a net profit of 7·7s. per ton. This improvement was chiefly due to an increase in the yield, which was 27·27s. per ton, against an average gold content of 26·77s. in the ore blocked out and available. During the past two years considerable amounts have been spent out of profits in connection with additions to plant and excess development, but the expenditure under this head, Mr. Marriott says, has now almost ceased, and the profits earned can now be considered as practically available for dividend purposes.

* * * *

New Kleinfontein.

The announcement by the Chairman of the New Kleinfontein Company, Ltd., that the programme for the increase of the reduction equipment is now nearing completion, and that the plant will shortly be capable of treating up to 50,000 tons per month, will be received with satisfaction by everyone concerned. It is more than gratifying, moreover, to learn that the fall in values which was a notable feature of the development some time ago was due to temporary causes and that a falling-off in the grade of the upper Main Reef and Leader in the eastern section has been more than compensated by the improvement in the Main Reef development. The average from this section for the year was 8·27 dwts., as compared with 7·94 dwts. in 1910. In all the drives in the eastern subsidiary shaft which have been extended into the Orient ground ore of a high value has been exposed. The value of the ore developed in the central section was 8·61 dwts., which shows an improvement of 2 dwts. as compared with the previous year. The western section, which is practically free from mining difficulties, on the other hand, has unfortunately given very disappointing results, the average value of the year's development being only 3·95 dwts., representing a falling-off of over 2 dwts. as compared with the results of 1910. It will be possible to accelerate development in the Orient section by means of a drive from the Modderfontein mine on the east, the latter company have generously agreed to the proposal. The reserves are worth special reference. They are:—Payable ore developed: During 1911—59 per cent., 8·79 dwts.; to end of April, 1912, 68 per cent., 10·85 dwts. Unpayable ore developed: During 1911—41 per cent., 2.62 dwts.; to end of April, 1912, 32 per cent., 2·39 dwts. Average: During 1911, 6·34 dwts.; to end of April, 1912, 7·74 dwts. This is quite encouraging, as Colonel Dalrymple remarked from the chair, and shows an increase in the grade of ore developed to date of 1·4 dwt. as compared with 1911, mainly due to an increase in the value of the ore exposed in the eastern section. The values obtained in the lower stopes of the eastern section have been very disappointing, however, and in the majority of cases the faces have dropped to below the payable limit, compelling for the time being a restriction of mining operations in this section. The matter of the bank loan, which stood at £174,000 at the end of the year has received the earnest consideration of the board, and after taking into review the various methods of freeing the company from the burden, it has been decided that the most desirable one is that of making a further issue of shares, which shareholders would be invited to take up *pro rata* to their holdings. When the present programme of capital expenditure is completed, the ultimate liability of the company, making due allowance for the proportion of profits diverted to meet charges under this head, will be about £250,000. The matter is still under consideration, but the directors hope to be able to put forward a scheme shortly on the line suggested, which will enable the company to start on its larger scale of operations free from debt. Altogether, the reports and speech of the Chairman reveal a satisfactory and encouraging position.

Diamond Drilling: Mr. Hoffmann's Paper.

Mr. John T. Hoffmann's interesting paper, "Recent Practice in Diamond Drilling and Borehole Surveying," evoked a good deal of discussion at the general meeting of the Institution of Mining and Metallurgy held in London on April 18th. Mr. H. F. Marriott, in criticising the paper, remarked that the apparatus described by Mr. Hoffmann was not really a simpler one than his own, but it required less preparation. The readings were not so absolute, because it lacked the locking and unlocking of the needle, which was his chief feature. But the instrument described in the paper more nearly met the requirements of people who wanted to take a small number of readings intermittently. It also could be easily made and worked with a moderate degree of accuracy. Mr. W. M. Trewartha James said he did not know if the author intended it, but, in stating the main objects aimed at in diamond drill boring on the Rand, he restricted its use to the determination of the thickness of the reef and the depth at which it lay below the surface; the author would agree it also gave the structural character of the rock which was passed through, from which at times important information would be obtained. But the diamond drill bore had been used also for the purpose of ascertaining, or attempting to ascertain, values. He took it that on the Rand that use had long since been discarded, but he thought there were still many engineers who expected that the small core, derived from the diamond drill bore, would in some way be representative of the average value of the ore-body through which it must pass. He took it the author deliberately omitted that, and would agree that it was very dangerous indeed to rely on the value of cores except in materials like coal seams, where one had relatively homogeneous material; in this latter case, also, under certain special conditions, he did think a degree of reliance could be placed upon the character, the composition and values as indicated by the core. Mr. Hoffmann said that since writing the paper, he had learnt that Oehman's borehole survey instrument, which he had described on page 2, had already been described in a paper read before the British Association. He had an idea that a paper had been read on Oehman's instrument before one of the Institutions of Engineers, but although he looked up the "Transactions" of several institutions he could not find any description of it, and after reading through the chapter entitled "Some Boring Problems" in Mr. R. A. S. Redmayne's book on "Modern Practice in Mining," vol. I., which was only published in 1908, and in which he described several borehole surveying instruments, including Mr. H. F. Marriott's, he came to the conclusion that he was mistaken, and that the description of Oehman's instrument had never been published. In any case, a short description and a drawing of the instrument were necessary to the paper in order to show how Payne Gallwey's invention for surveying the wedges was used.

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Tungsten Production in 1911.

There was a sharp falling-off in the production of tungsten ores in 1911, owing to the decrease in the market for tool steels, in which the bulk of the tungsten is used. According to preliminary figures collected by Frank L. Hess, of the United States Geological Survey, about 1,125 short tons of concentrates carrying 60 per cent. tungstein trioxide were produced and shipped during the year, which is less than two-thirds of the output for 1910, when 1,821 tons were marketed. The prices for the year ranged from 4·50 dollars to 8·50 dollars per unit, depending on quantity, quality and individual bargaining. At the close of the year 5 dollars per unit were offered. The unit is 20 lb. of tungsten trioxide per short ton of ore. As usual, Colorado gave the largest returns, 740 tons, and the Atolia (California) deposits the second largest. Smaller amounts were produced in Arizona, Nevada, Idaho and Washington.

TOPICS OF THE WEEK.

THE CENTRAL MINING SUBSIDIARIES.

Meetings of half-a-dozen mines connected with the Central Mining Corporation were held this week, and will be found fully reported elsewhere in this issue. The actual returns from the properties during 1911 are already familiar to shareholders, owing to the publication, some months ago, of the annual reports. In the circumstances, therefore, chairmen had no option, if their speeches were to be of any live interest, but to deal with the results of the past five months' working, and to indicate the prospects for the future. Despite the many difficulties that beset the Rand during recent months, the speeches will be found on the whole satisfactory reading. The City Deep fully bears out the report by Mr. H. Stuart Martin, written some months ago. In 1911 the mine suffered severely owing to want of native labour, to the poor efficiency of the underground force, both white and black, and to the lack of compressed air during the earlier portion of the year. It was also found that better ventilation, as well as better facilities for the handling of men and material, were required for the upper levels of the mine. At the meeting, Mr. R. W. Schumacher, the chairman, went into details of the ore developed and underlined the values in the richest section which extends over 5,000 feet. "This mile of ground," he said, "constitutes probably one of the finest mines in existence." On the question of dividends, Mr. Schumacher said that the cash position was about square at the end of March; that the company had liabilities to be met in the near future amounting to about £45,000, apart from £25,000 for the sinking of No. 1 vertical shaft, and £20,000 to be spent later on the electrification of the hoists at the west shaft. The company is now making profits at the rate of well over £20,000 per month. For the month of May the tonnage milled will be increased to about 35,000 tons from the mine, and it is hoped that the company will be crushing the full 60,000 tons at about the end of the year. It will be seen, therefore, that the rate of monthly profits should undoubtedly increase. "It is obvious," said the Chairman in conclusion, "that no dividend will be declared at the end of June next, but there seems to be every likelihood of a small dividend at the end of the current year. After 1912 shareholders ought to be able to expect with confidence the distribution of regular and satisfactory dividends. I have endeavoured to explain that the general prospects of the mine are bright; that the profits are, as far as we can see, bound to improve; that our legal advisers have no anxiety about the pending law suit, and I trust that shareholders who have been patient so long will bear a little longer that they may reap the full rewards which we firmly believe will now soon come." Mr. H. C. Boyd, who presided at the Village Deep meeting, was able to point to the "very material improvement in the position and prospects of the property." He described the centralisation scheme, which is necessary for the working of the mine in depth, and which should favourably affect working costs. To attain this position, however, he mentioned that further capital expenditure was unfortunately necessary. Something in the neighbourhood of £40,000 have yet to be spent this year. The profits earned to the end of April have amounted to £93,310, making with the special declaration of the gold reserve in March a total profit of £118,065, out of which about £12,000 have been spent on capital account. "Provided development values continue in their present satisfactory position," he said, "a recovery in the neighbourhood of 28s. 6d. per ton on the average can safely be reckoned on. With the higher costs now ruling, due to the necessity of meeting the comparatively heavy underground expenditure out of working costs, it has been deemed expedient to raise the pay limit somewhat for the time being. This entails leaving 175,000 tons of the reserves standing temporarily, but enables us to aim at the grade just mentioned without any danger of reducing the average value of the remaining reserves." He added: "Without attaching too much importance to individual figures, it is obviously extremely encouraging that the bottom of the mine should be giving such satisfactory indications." At the Robinson meeting, the Chairman, Mr. E. A. Wallers, dwelt on the honourable old age enjoyed by the company, despite some natural disabilities. Of the immediate future, Mr. Wallers said: "As to the policy to be pursued during the current year, I would say at once that the object we have in view is to obtain the greatest possible monthly profit consistent with safe working. It is clear to you, I take it, from what we have said, that with the conditions that are inseparable from age, it is necessary to watch things very carefully and modify from time to time, in certain directions, the methods of working. The capacity of your plant enables the treatment of 55,000 tons per month, and if it were possible to fill the plant every month with this tonnage from your rich reefs, and at the same time keep the mine safe, it would be well to do so. We cannot do this, however, because, as I have tried to explain, the blocks of South Reef and Main Reef Leader are becoming steadily more isolated and scattered. We have therefore set ourselves to increase the percentage of payable Main Reef mined, to endeavour to increase the tonnage milled to 55,000 tons per month (the full capacity of the plant), to increase the sands sent down the mine to over 50,000 tons per month, and last, but not least, to try to reduce working costs, so that the Main Reef, which to-day presents but a small margin of profit, shall produce better profits." The Bantjes is experiencing better times. The plant is giving excellent results, and the comparatively small decrease in the ore reserves during last year is of no serious nature. Dealing with the position and prospects for the current year, Mr. Wallers, the chairman, said at the annual meeting: "You will have realised that in your mine, as in others under our control, we are quietly but steadily trying to improve our facilities for the cheaper handling of the ore, and simultaneously to accomplish the work with less unskilled labour. You will have noticed, also, that your financial position at the end of last year, as reflected in the balance sheet in your possession, was satisfactorily clear of all debt. The profits earned for the first four months of this year have amounted to £23,500 (the profit for last month being £6,170), exclusive of the reserve of £2,980 also declared, and we have been considerably short of the tonnage for our full plant capacity. Further, I can assure you that all expenditure will be watched with an exceedingly careful eye, and last but not least, our first declaration of a five per cent. dividend in respect of the current half-year's profit will be made next month." Important changes have been made at the Geldenhuis Deep, and they have proved to be changes for the better. Mr. H. Eckstein put the position very clearly in concluding his speech at the annual meeting. "The whole position," he said, "can be summed up in a few words: Owing to various reasons, which I have fully dealt with, the policy outlined some three years ago for the working of the mine has had to be modified in several respects. We are still in a state of transition, and, that being so, it would be unwise to venture any prediction at this juncture as to the immediate or future prospects. Working costs will certainly have an important bearing on future results, and I am confident that the management will not rest until a decided improvement can be shown in this direction." From the Durban Roodepoort Deep comes an unusually cheerful account of things. Many troubles have been overcome, working costs reduced and a good year is now expected. Indeed, for a brief but comprehensive summary of the work, Mr. Wallers' own words cannot be improved upon. "To sum up the position," he said, "we hope to see an increased distribution to shareholders this year as compared with last year, barring any unforeseen accident, and at the same time steadily to liquidate the existing liability of which the temporary financing presents no difficulty. The development of your mine continues to reflect values which, as you will have noticed, are quite satisfactory, and I think the general position of the mine and plant entitles us to look for a successful year's work." These brief summaries will show that nothing but time and reasonable mining luck are needed to enable these great mines of the Eckstein group to realise their full possibilities.

PROGRESS OF THE BARNATO MINES.

Mr. J. Munro was able to speak of a year of steady progress and good work well done at the annual meetings of subsidiaries of the Johannesburg Consolidated Investment Company held on Wednesday. The "J.C.I.," or as it is more generally spoken of, the Barnato group, has practically no interest on the Western Witwatersrand. With the exception of the Randfontein Deep, the activity of the company centres in the Central Rand, the Germiston area and the "farther East Rand," and in each of these spheres the year 1911 was productive of results on which the management are to be congratulated. Probably no other group on the Witwatersrand has carried on operations in such an even and one might almost say uneventful manner as the Johannesburg Consolidated Investment Company. A conservative attitude in regard to new mechanical, electrical and metallurgical devices has been pursued throughout the history of the corporation, although it must readily be admitted that, when satisfied, the Barnato management always gives material evidence of appreciation of any innovation—witness, for instance, the new plant of the Consolidated Langlaagte Mines, where more tube mills are being installed than at any other battery of similar size on the Rand. Then again Barnatos have not brought any new producer into the arena of industry for years past. The Van Ryn Deep will shortly become productive, and at a later date the Government Areas on Modderfontein; but in 1911, as in previous years, the parental company earned its revenue from the old outcrop mines in the neighbourhood of Germiston and Langlaagte. The New Primrose has been a mainstay of the company since first the properties of the Rand began to group themselves and seek financial aid and technical administration under the sheltering wings of the various groups. It is more than gratifying to find that not only did this company earn the very substantial profit of £217,658 from 281,648 tons milled—which compares with £210,279 from 257,168 tons in 1910, but also that the prospects of an increased life are very good. In the words of the Chairman, "the further the reinvestigation of the older parts of the mine is proceeded with the more it becomes apparent that large quantities of ore were left undisturbed at the period when the mine was first worked." At the Ginsberg the ore reserves at 367,646 tons of 6·8 dwts. value show an increase in both quantity and quality as compared with last year. The profit earned amounted to £59,344, which is nearly £11,000 higher than that earned during 1910. Here, too, there is every indication that the period of productivity will substantially exceed the most sanguine estimates of previous years. "On the whole the mine looks very promising at the present time," remarked Mr. Munro. The Glencairn Main Reef's profit of £29,035 is slightly higher than that announced in respect of the 1910 operations, but the ore in reserve—925,000 tons of the low average assay value of 3·5 dwts.—is 195,000 tons less, and the estimated recoverable value is slightly lower. It appears that several blocks of reef-bearing ground have been found to be of lower grade than anticipated, and accordingly have been eliminated from estimates. Although the margin of profit at this mine is very low, Mr. Munro was able to tell shareholders that "the company should continue to pay small dividends for some years to come." At the "Knights" (or Witwatersrand G.M. Company) profits are "down" £46,000 as a result of a decrease in the yield of 1s. 6d. and increase in working costs of 7d. per ton. Since the conclusion of the year profits have largely increased, the profit for April being as high as £18,581, so that it is reasonable to expect a much improved aggregate for the current year. These results have been accomplished by mining ore of a grade more in keeping with the average grade of the mine. In consequence current expenses have risen, but, as the Chairman remarked, "low working costs are not always synonymous with the best economic results." The ore reserves at a million and a quarter tons are much the same as in the preceding year. The somewhat erratic New Rietfontein Estate is in a better position as regards ore reserves, and there are now tonnages in sight equal to two years' milling, whilst, in addition, a large tonnage is still available from reclamation work. The working profit was £30,349, as contrasted with £15,626 in 1910. Turning now to the two West-Central Rand producers, the Consolidated Langlaagte stands out prominently as a concern which will substantially advance the productive prestige of the group in the immediate future. Here the profit earned was £84,667—slightly in excess of the previous year's return. This was earned from the outcrop mine, in which the ore reserves at the end of the year stood at almost 400,000 tons. In the southern section 1,400,000 tons stood developed at the end of April. The new equipment, which has been described in detail in previous issues of this journal, will be ready to commence crushing by the beginning of July, if power is available. The New Unified represents the most westerly of the Barnato group of producers. The profit at £51,987 shows the considerable improvement of £18,870 over the preceding year owing to increased grade and lower costs. The mine is looking well, particularly in the bottom levels, and the ore reserves—288,343 tons of an estimated value of 6·73 dwts.—are slightly in excess of last year's tonnage. On the further East Rand the Johannesburg Consolidated Investment Company possesses two great prospective producers in the Van Ryn Deep and the Government Areas on Modderfontein. In twelve months' time the reduction plant of the former company, of 40,000 tons per month capacity, is expected to start crushing. The tonnage of ore developed at the end of the year was 603,716 tons of 7·17 dwts. value. Finances have been satisfactorily arranged, and the outlook is distinctly promising. As Mr. Dalrymple, who seconded the adoption of the report, remarked, "the company should inaugurate its career in as auspicious a manner as its neighbour the Brakpan Mines." Mr. Gustav Imroth reminded shareholders at the Government Areas meeting that the area of the mine was an enormous one, covering over 2,600 claims, and that the whole of the capital of the company of £1,400,000 was represented by the same amount in cash. The rate of progress in the four shafts has been very satisfactory. Most rapid progress has been made in the south-east shaft, which at the end of April was down to a depth of 2,182 feet, the footage sunk in March constituting a record. It was hoped that reef would be reached in the neighbourhood of the present depth—2,300 feet—but it now appears that another 200 or 300 feet will have to be sunk before the reef is encountered. With two large prospective producers like the Van Ryn Deep and Government Areas looming in the future, with the new mill of the Consolidated Langlaagte completed and development of the southern section well advanced, and with the positions at the six other producers in a satisfactory state, the outlook for the future of the Barnato group is undeniably good.

HOUSING RAND MINERS.

Mr. R. W. Schumacher's Offer to City Deep Men—A Scheme with Great Possibilities—Some Points and Details.

Last Saturday night Mr. R. W. Schumacher, at a smoking concert of employees of the City Deep Gold Mine, Ltd., outlined an important proposal of the company for the acquirement by the men of houses on the company's property, in the locality known as Regent's Park. Mr. Schumacher, after referring to the constant changes that were taking place on the mines, said that the state of affairs was not right, nor was it necessary, and it should not be. He had come there that night to offer them a partial remedy; he could not offer them a complete one—for such things as he had in his mind could not be put right in a day, or a week, or a month. He wanted to give to the men of the City Deep special facilities for obtaining freehold land and for building their own homes; in fact, he wanted to make a present of the township of Regent's Park, or, rather, the unsold stands in that township, to the men of the City Deep. Of these stands there were 308 that were unsold, and their market value was probably between £9,000 and £10,000. Speaking as chairman of the company, he could justify his action to the shareholders in offering them this ground for practically nothing. There was a certain number of unsold stands, and his idea was that not less than two adjacent stands should be acquired by any one man. They would, therefore, have 100 by 100 feet, and, if he had more ground at his disposal, he would make them still bigger, but for the time being he was limited by the number. His proposal, subject to any alteration, roughly, was that the stands should be put in at approximate cost price, which would be for the two, £20 freehold; that certain designs should be agreed upon as to the type of house, costing, say, £400 each; that the men should put up as much money as they could, and that the company should advance the rest. When built, the house would belong to the man and not to the company, and whether he stayed in the employ of the company or left it, there would be no disturbance of possession as long as the money due to the company was regularly paid. They had to make a beginning, and his first idea was that there should be some inducement to the men to stay in the service of the company; and the first offer would be to men who had been in that service a certain period, as short as possible. Men who had been six months on the surface or underground should have the right to apply. Once they had their houses, the company would have no more hold upon them except that the company would retain the title until the money had been paid. People might say that the more independent the miners were the more likely they were to strike. His own feeling was that as long as the men were treated well they were not going to strike. Personally, he was not afraid of anything of the kind. They must remember that the company was not able to finance houses beyond a certain amount, and perhaps twenty houses at £400 a house would be a start. Perhaps also each man's preliminary expenses would be £30. Then if each man could put down £50, reckoning interest at 5 per cent., he would be able to pay off the whole of his indebtedness in four years, if he paid about £9 per month, and he would then have the titles. But as soon as a man entered the house it would be his. What he was proposing was not in itself a very big scheme, but it might be the beginning of one, and he would like to extend the facilities to other large mine areas along the Reef. Some of the company's mines had townships, others had not, and not much could be done without the help of the Government, for under the Gold Law the companies could not do what they liked with the surface rights, even when they were the freehold owners. His hope was that the Government and the Johannesburg Municipality would co-operate to carry this scheme right along the Reef, when he felt sure that there would be a radical alteration for the better of life on the fields. His idea was that every man, in whatever private or public service, should have an opportunity of founding his own home.

A PROGRESSIVE PROGRAMME AT THE GEDULD.

Features of the Additional Reduction Plant—Improved Modern Surface Equipment—Underground Plans.

In our last issue we informed our readers that the Geduld Proprietary Mines, Ltd., is raising £125,000 for the purpose of increasing the capacity of its reduction plant and carrying out further development work, and we are enabled this week to give details of the scheme propounded.

Reduction Plant.

The reduction plant on this mine will be increased during the next twelve months from its present capacity of 168,000 tons per annum to a capacity of 288,000 tons per annum. This increase involves the mining of about 30,000 tons per month, allowing for discarded waste, or about 1,200 tons per day, all of which will be hoisted through No. 2 shaft, in the neighbourhood of which the reduction plant is situated. The increase in capacity will be obtained by adding ten stamps of 1,650 lbs. weight and three tube mills, each 5ft. 6in. by 22ft., with three stationary amalgamation plates per tube mill. This will bring the crushing plant up to a total of sixty heavy stamps and five tube mills. The amalgamation plates now in front of the stamps will be removed, as coarse crushing (through screens having nine holes per square inch) would cause scouring of such plates, and twenty short plates will be put in the circuit between tube mill classification cones and the cyanide works. The pump house for elevating mill pulp will be removed, the present plunger pumps discarded and centrifugal pumps installed. It is intended to produce 60 per cent. of slime and 40 per cent. of sand, the two products being separated by Caldecott cones, and the sand collected on two 15ft. Caldecott tables, which are to be installed. The treatment capacity of the sands plant will be obtained by converting the present collecting tanks into treatment tanks. The present decantation system for treating slime will be discontinued and be replaced by an air lift agitation plant for dissolving the gold, and Butters' filter plant for separating gold-bearing solution from slime. For this purpose four Brown tanks, each 15ft. by 45ft. high, will be installed, together with a filter plant containing 190 Butters' vacuum filter leaves, all of the existing slimes tanks being used in connection with the altered plant as collectors, storage and solution tanks. The reason for altering the system of slime treatment is the increased extraction which can be obtained. The laboratory plant has shown that on Geduld slime a reduction of ·175 dwt., or 9d. per ton, in slime residue can be effected. The slimes plant will have a capacity of 15,000 tons per month. The hoisting plant will be equipped with six-ton skips, for the accommodation of which, and for the increased bin capacity, alterations in the headgear will be required, and better arrangements for washing the ore before going over the sorting belts will also be provided. The additional power needed for the enlarged plant will be obtained by the installation of an 800 k.w. mixed pressure steam turbine, utilising the exhaust steam from hauling engines and air compressors. Additional cottages for mine employees will be erected, the native compound enlarged to accommodate 850 additional boys, the hospital accommodation increased and an isolation ward provided. The re-arrangement of the reduction plant is being effected in such a manner that it will be an easy matter to add on further units whenever it is decided to further increase the crushing capacity.

Underground.

The main north and south drives from No. 2 shaft, which have a total length of 8,350 feet, are equipped for hauling rock with electric locomotives. This level will control all the ore lying to the west of and on the dip of the reef above No. 2 shaft, the ore being collected in subsidiary levels and gravitated through raises to this main haulage level. The main incline opening up the reef on the dip below No. 2 shaft, starting from the main station, has been carried eastwards a distance of 3,240 feet, and will be advanced immediately a further 1,000 feet. This incline is being equipped with a mechanically driven rope haulage. The accommodation at the main station is being enlarged and improved upon so that all loaded trucks will come in from the south to be dumped by power driven tipplers, the empties passing out to the north. The main drive from No. 3 shaft, where no work is at present being carried on, will soon be connected up with the main incline from No. 2 shaft, and development work will then again be started at No. 3 shaft; the ground broken in the workings from that shaft will be delivered through this connection by mule haulage.

Schweizer Reneke Prospecting.

The *Klerksdorp Record* prints particulars concerning the diamond prospecting work which has been proceeding in the Schweizer Reneke neighbourhood, during the last five months. Up till April 1st, however, the operations had not been very successful, although a certain property which had been prospected for a Kimberley syndicate and abandoned by the syndicate just when some very good indications had been discovered, has been taken up by other parties, who have met with success. The farm in question is named Koppies Vlei, and is situated some 10 or 12 miles from Schweizer Reneke on the Harts River. During the last ten months vigorous prospecting has been carried on upon the farm Rietput, adjoining the Schweizer Reneke township, and an old river bed discovered, running parallel with the Harts River, carrying fairly deep gravel, which looks very promising indeed. The deposit seems identical with those of the Vaal River, below Fourteen Streams. Over thirty diamonds have been found in the deposit already by the two parties, during the past six weeks; nearly all of them being of excellent quality. Only one wash during that time has proved a blank, and this was but a small quantity of gravel, certainly not more than about thirty loads. Most of the diamonds found have been small, the largest being just under seven carats, but considering the amount of work done this does not prove that no large ones exist.

Klerksdorp Farms Proclaimed.

The Minister of Mines has approved of the farms Ireton No. 72 and Pahtiki No. 69, Potchefstroom district, mining district of Klerksdorp, Transvaal Province, being open to prospecting on and after the 28th day of May, 1912. Prospecting for precious and base metals under the authority of a prospecting permit may be carried on on such land on and after the said 28th day of May, 1912; provided, however, that the holder of a prospecting permit shall before commencing operations thereon first notify the occupier thereof (if any) of his intention.

Proclaimed Land Open to Prospecting.

The Minister of Mines has approved of the ground detailed below, situate in the Zoutpansberg district, mining district of Pietersburg, Province of the Transvaal, and formerly held as discoverer's claims, being thrown open to prospecting on and after the 10th day of June, 1912. Subject therefore to the provisions of Chapter I., Part II., of the said Act, prospecting for precious and base metals under the authority of a prospecting permit may be carried on on such land on and after the said 10th day of June, 1912:—On 96 claims on the farms Sagan No. 1457 and Ryswyk No. 1456, Zoutpansberg; on the farm Skutwater No. 1346, Zoutpansberg; and on the farm Klein Letaba Division, Section 2, Zoutpansberg.

THE CROWN MINES' POSITION.

Satisfactory Progress of the Plan of Expansion—Sound Judgment and Wide Experience in Evidence—A Wide Margin of Safety in the Reserves.

If Mr. Reyersbach's address to the shareholders of the Crown Deep, on the 9th of April, 1909, furnished abundant justification, from the theoretical standpoint, for the great scheme of amalgamation which had been thought over and discussed by directors and engineers for so many months previously, and was then unfolded in all its detail and submitted to the consideration of shareholders, the results which have followed upon the practical development of the scheme still more abundantly strengthen the arguments used to recommend it. It is unnecessary to recapitulate the several excellent reasons which were adduced for this particular amalgamation, for a succession of proposals of a similar, if less attractive, kind have made everyone acquainted with the nature of those advantages which have been foretold as more or less certain to follow the fusion of comparatively small mining ventures. The experience gained with regard to some of these larger enterprises has not altogether popularised the idea of amalgamation, perhaps, but nothing has happened, since the idea was first carried into effect upon the Rand, to refute the general statement that large scale mining, under proper conditions, is sound economy, and, within reasonable limits, admirably adapted to the low grade ore bodies of the deeper levels of the Main Reef Series. What constitute proper conditions are primarily a due regard to fair grading, ample development, an abundant and efficient labour supply, and last, but not least, efficient management, and where one or other of these requirements are non-existent to a sufficient degree, the best-planned scheme of large-scale mining is bound to prove a failure.

The Crown Mines amalgamation has not yet been tested by what may be called normal working results, for the preparations necessary to the carrying out of operations upon the lines proposed are still in progress, and it will take some months before the undertaking is able to get into anything like settled working conditions. It may fairly be judged, however, by the way in which provision has been made for the future, and by the agreement which is found between what has been anticipated and what has been accomplished. From this point of view there appears no reason to doubt the wisdom of the amalgamation, or to fear that it will fail in its object from want of skill or sound management.

A MODEL ENTERPRISE.

As a mining proposition the Crown Mines probably represents one of the most carefully-planned undertakings of its kind in the world, both from the point of view of its development and from that of the working scheme which has been laid down for future operations. The payable ore reserves, as reported by the Consulting Engineer and General Manager at the end of last year, amounted to 10,124,072 tons, of which the value in recoverable gold is £14,816,326, or, roughly, 15 million pounds sterling. On the basis of only 14s. profit per ton, and leaving out of account another 1¼ million tons which can be mined, but cannot yet be valued in the ordinary way, there is in sight a profit of over £6,000,000, or six times the nominal capital of the company, and nearly equal to 50 per cent. of the whole market valuation of the 1,880,096 issued 10s. shares, which are quoted to-day in the vicinity of £7. During last year the ore disclosed amounted to 1,712,353 tons of an average value of 7.3 dwts., and advance development is to be continued at as rapid a rate as possible, not so much for the purpose of increasing the reserves as to facilitate the economical handling and transport of ore. By way of comparison, it may be mentioned that the ore reserves at the Crown Mines, including the 1,250,000 tons, of which the greater portion will doubtless be payable, are equal to more than 80 per cent. of the total combined milling reserves of the East Rand Proprietary Mines and the Central Randfontein, while the average value is probably about 2s. per ton higher. The stamp capacity, on the other hand, is as 835 to 1,820, so that the margin of safety is easily in favour of the Crown Mines as against that of the other two companies combined on the basis of reserve alone. Market valuation can scarcely be taken into account in this connection, at the moment, for in the case of both the East Rand Proprietary Mines and the Randfontein Central, the share quotation is largely affected by circumstances other than the actual value of the ore in sight.

WORKING FACILITIES.

In the matter of a working plan, no less than in that of an advanced policy of development, are thought and wide experience abundantly evident at the Crown Mines. In the properties that comprised the units which were amalgamated there were, as Mr. Reyersbach pointed out, no less than fifteen main thoroughfares sunk between the surface and the reef series. Seven winding shafts were in use for hoisting ore at the time the scheme was carried through. When the preparatory work now in progress has been completed only two shafts will be used, connected at a vertical depth of 2,000 feet by means of a main roadway, 15 feet wide by 9 feet high, and served by electric haulage. The final length of this drive, between the eastern and western boundaries of the property, will be nearly three miles, and to it will be brought all the reserves already in sight, and the reserves to be developed for a good many years to come. The other shafts will be used for ventilation, or, when necessary for the ingress and egress of men and materials. The two shafts will have a combined hoisting and sorting capacity of 11,000 tons per day, or more than 30 per cent. greater than will be demanded by the plant when run at the full supply of 212,000 tons per month. Sufficient stope faces are in readiness for the larger scale of operations contemplated, and since the mine is about four years' ahead of the mills there is ample opportunity for keeping development well in advance, provided the labour supply continues satisfactory.

With regard to working costs, one has little hesitation in accepting Mr. Samuel Evans' assurances on the subject. In the last two years, as he explains, the charges under this head have been of an abnormal character, due entirely to the transition stage, and will, to a large extent, if not entirely, disappear after the completion of the enlargement programme. For instance, shaft maintenance has been a particularly expensive item, on which there should be considerable economy when only two well-equipped and up-to-date shafts are used instead of seven, some of which demand constant repair.

A WELL-INSPIRED WORKING PLAN.

The Crown Mines' plan of proposed operations has obviously been devised to give the fullest play to those favourable conditions which make all the difference between success and failure in the case of a big mining and milling policy. There are, moreover, the object lessons of other large amalgamations, where want of sound judgment and correct practice have led to disaster, and, prominently recorded as they are in the recent history of the Rand, it is scarcely to be doubted that they will serve as warnings which are little likely to be disregarded.

French Rand Deep.

An extraordinary general meeting of the shareholders in the French Rand Deep, Ltd., will be held on Tuesday, the 23rd day of July, 1912, to consider the voluntary liquidation of the company.

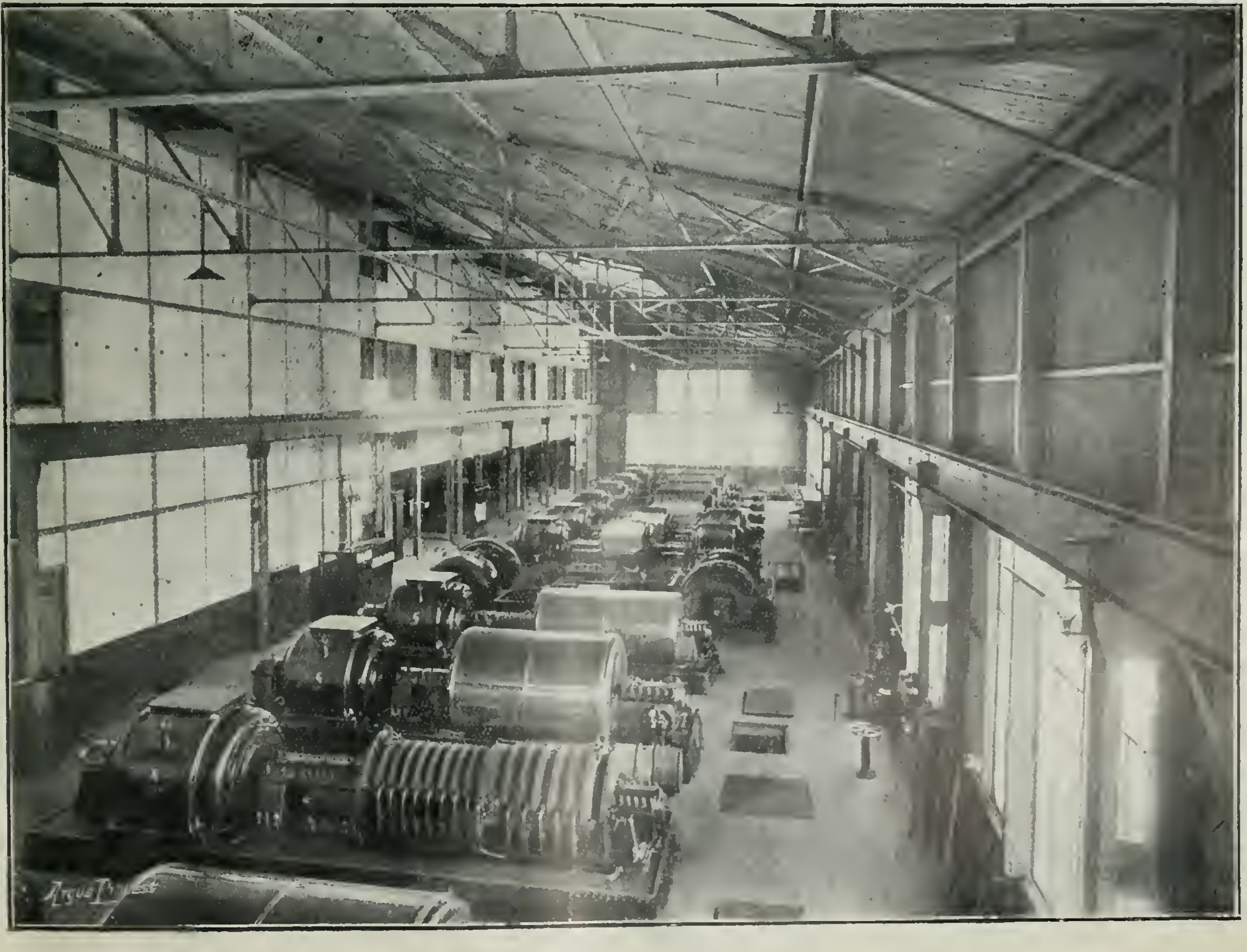
THE ROBINSON CENTRAL COMPRESSOR STATION.

A Well-Equipped Source of Air Power—Some Types of Turbo-Compressors—Output and Cost of Air Supply.

THE general arrangement of the compressor plant of the Victoria Falls and Transvaal Power Supply Company, Ltd., and Rand Mines Power Supply Company, Ltd., at the Robinson Central station was described in our issue of the 18th May, and the accompanying illustrations, which we are permitted, by the courtesy of the company, to reproduce, will serve to give some idea of the magnitude and great capacity of the installation.

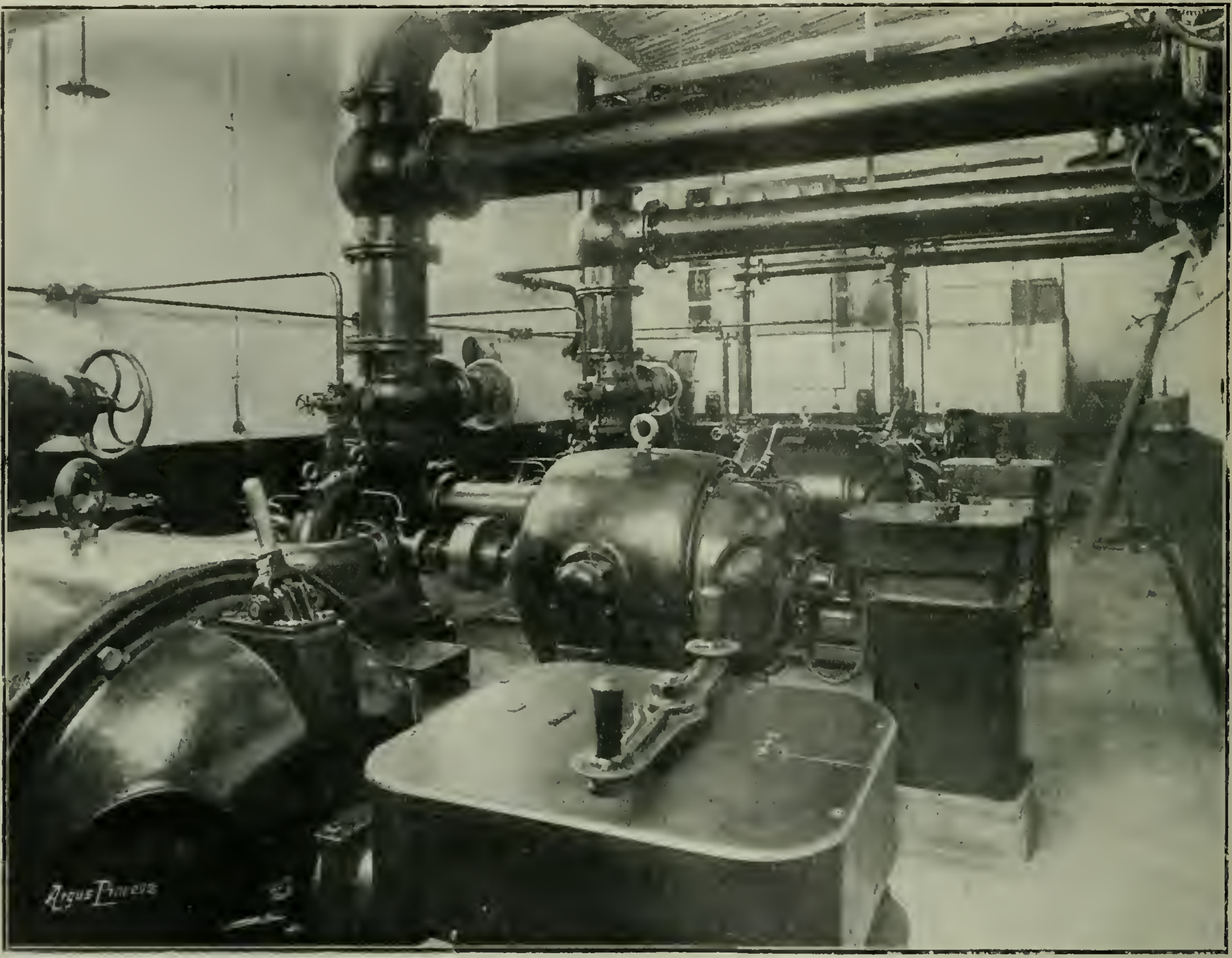
The first picture has been taken from the outer edge of the station intake on the western side of the Robinson dam. On the left of the main building will be observed the new structure, now in course of erection, which is to serve as one of the distributing centres for the current which will be supplied from the Vereeniging power station. On the right side of the building is located the turbine com-

GENERAL VIEW OF STATION FROM THE ROBINSON DAM.



INTERIOR OF TURBO-COMPRESSOR ROOM.

pressor-room, the interior of which is depicted in another illustration. Projecting from the northern wall is to be seen the air filter section, into which the air enters through shutters in the upper portion. To the right are the shaft and mill sites of the old Robinson Central Deep, and behind, a prominent object in the landscape of the neighbourhood, stands the dump of the Crown Deep section of what is now the Crown Mines, Ltd.



Pumping Plant for Inter-Coolers.

The turbine room is, it will be seen, a roomy and splendidly-equipped compartment. Ten of the twelve turbo-compressor units erected are shown in the illustration, the view being taken from the eastern, or Robinson dam, end of the building. On the left, in a recess, is the switchboard room and office of the engineer on duty, while on the right, at about the centre of the room, is the passage to the air filter installation. On the latter side, also, a stairway leads to the basement, where the intercoolers are erected. Commencing at the further end, the first four compressor units, comprising two compressor sets, are of the A.E.G. type, in which the air is compressed through its first stage in one unit and passed for final compression through an inter-cooler to a second unit. Following these four units are two, or one set, of the Pokorny and Wittekind type, which, as we pointed out in our description of the plant a fortnight ago, are in several ways rather remarkable engines. In these the cycle of compression includes three stages, the first being effected in two end cylinders, each of which take a portion of the entering air stream, the next in the second cylinder of one unit, and the last stage in the second cylinder of the other unit, the air being cooled at several intermediate points.

A third type of compressor is that known as the Gutehoffnungshütte, of which there are six units, or three compressor sets, shown near the foreground of the accompanying illustration. In this type, it may be remembered, we pointed out that each unit had a high and low pressure section in the same shafts, and that two stages of compression were effected in the first unit of the set before the air was passed for the two final stages of compression to the second unit. The casing of one of the units of this type is removed, and the last two units of the installation, which fall outside the lower limits of the photograph, complete the group of twelve turbo-compressors which comprise the equipment of the station.

The total average output of air per month is 3,200,000,000 cubic feet, and the average pressure at the mines is 100 lbs. per square inch. The drop in pressure between the compressor station and the mines averages about five pounds per square inch only, so that the distance over which it is possible to supply compressed air effectively has by no means been reached. As 16 cubic feet of air weighs 1 lb., the monthly air output is 200,000 short tons, a figure comparable with the weight of rock hoisted. The ordinary cubical rainwater tank 4 feet by 4 feet by 4 feet has a capacity of 64 cubic feet, or 4 lbs.' weight of air, and six of these full are compressed and delivered and sold for a halfpenny.

Mr. Henry Birchenough, C.M.G., and Mrs. Birchenough arrived at Capetown by the Balmoral Castle last Tuesday morning.

THE MINERS' TRAINING SCHOOL.

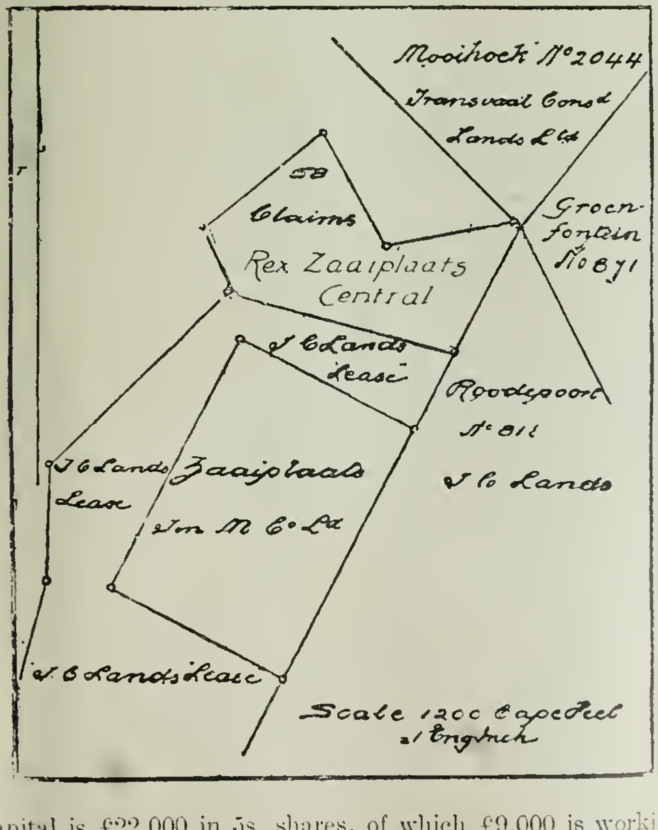
Advantages Offered by Government at the Wolhuter Institution—An Opening for South African Lads.

In the training school at the Wolhuter for young miners, a three years' course of tuition is provided for, and the following lines of work are thoroughly taught, viz., timber work, pipe laying and plate laying, pumps, hand drilling, machine drilling, ambulance work for accidents, and general mine work. Intending pupils must be between seventeen and twenty-five years of age, and submit a medical certificate testifying to a sound condition of the lungs, as well as a certificate of character from a responsible person. Candidates accepted are to agree to be indentured for three years, so that they really become apprentices to the trade. A surety for £10 is to be provided in case of failure of an apprentice to complete his term of indenture. Unlike the old custom of apprenticeship where it was usual for the apprentice to work for nothing while learning his trade, or for a very trifling remuneration during the later years of apprenticeship, pay is received from the commencement. In the Government Mines' Training School the pupil begins with an immediate remuneration of 4s. 3d. per working day, increasing by threepence per day at six-monthly intervals, until he has had a year and nine months' training, when he gets 5s. 6d. per day. During the last three months of his apprenticeship his pay will be 6s. 9d. per day. The working day will be not more than eight hours at the face any one day. Provision is made for withdrawal if either of the parties, that is the School Superintendent or the guardian of the apprentice, desires at the expiration of three months to cancel the agreement. The instructor can at his discretion put an apprentice on piece-work, and may credit him with bonuses payable on the completion of each contract. The increase of pay provided for is dependent on the School Committee being satisfied that the apprentice shows reasonable improvement in his training, and diligence, care and attention to his work. In respect to the cost of living, it is to be noted that the cost of board and quarters, provided by the Committee, is fixed at £3 5s. per month; membership of the medical and benefit society requires another seven shillings, and reading-room membership a shilling, a total of £3 13s. This deducted from the lowest rate of pay at the beginning of the period of apprenticeship leaves a margin of about thirty shillings a month. In addition to actual manual labour work done by the apprentices, classes are held which are expected to be attended by the pupils for their instruction. What is apparent in the scheme is that any youth is able by taking advantage of it to provide for his own support from the start. Further, at the end of the time he will never be out of employment except by his own fault. The opportunity afforded by the school is one that should be widely availed of, and the care observed at the Wolhuter mine by the management of the health of the men, is such that the risk of miners' phthisis is reduced to a minimum.

A NEW TIN FLOTATION.

The Rex Zaaiplaats Central Company—Capital £22,000.

The Rex Zaaiplaats Central Tin Company has been formed to acquire 58 claims on the farm Zaaiplaats. The capital is £22,000 in 5s. shares, of which £9,000 is working capital and reserve. The principal workings are two shafts which are being sunk about 600 feet north of the Zaaiplaats Company's property on lodes running parallel with those on that mine, containing all the secondary minerals associated with the ore bodies on that property. The ore bodies having been located immediately on the southern boundary of the claims, give the entire benefit of the dip. The rock shows large and small cassiterite crystals right down the shafts, both of which have reached a depth of 70 feet. In the western shaft rich ore has been encountered for some distance down to the present depth. Mr. H. Graumann is the chairman of the company, and Mr. Thorburn, the engineer, is in charge of operations.



The accompanying sketch—which appeared in the London *Financial Times*—gives an idea of the situation of the Rex Zaaiplaats Central property.

Museum of Safety Appliances.

Mr. Wardle recently asked in the Imperial Parliament whether any arrangements had yet been made for a museum of safety appliances in Great Britain. Mr. McKenna said the Government had decided to establish such a museum, and the arrangements were in hand. The selection of the site had taken a little time, but the offer of a suitable site in a central position in Westminster had now been accepted, and provision had been made in the Estimates for commencing the erection of the building in the course of the present year.

Sir J. B. Robinson, in the course of an interview with a representative of the London *Financial News*, said he was unaware that Mr. J. W. S. Langerman contemplated resigning his seat in Parliament. He added that the position of the Randfontein Central G.M. Company was as hopeful as ever. The changes which had been made in the management were due to the desire to reduce expenditure and achieve thorough efficiency of the working.

GOLD IN THE BANKET REEFS.

Is Main Reef the Only Payable Series?—Additional Evidence Desirable—A Basis for Further Argument.

A few weeks ago Mr. David Draper contributed an article to this journal entitled "The Future of the banket Series in the Transvaal," and, as he anticipated, it has given rise to a good deal of adverse criticism on the part of prospectors and others who possess just those grievances against the mining houses that were so concisely expressed in the article referred to. None of these persons, unfortunately, have taken the trouble to put down in black and white their arguments in favour of other banket reefs than those of the Main Reef series, or of those outside districts which Mr. Draper regards as complete failures. It is quite possible to agree with him that the mining houses are accustomed to act on the principle of sound business and decline to spend large sums of money upon undertakings that have not sufficient promise of success, for there are few if any of the leading groups who have not lost a good many thousands, directly or indirectly, in exploratory work which has utterly failed to justify further expenditure. For instance, there are the investigations carried out on behalf of the Gold Fields and Eckstein houses in the Venterskroon district not longer ago than the early part of last year. There are the prospecting operations undertaken, at great cost and without reward, as far as we are aware, on the further East Rand and in the *terra incognita* which lies the south-west of the Princess Estate by other influential groups, and there are, again, the much-talked-of shafts, drives and cuttings that were put in along the Coronation line. All these have provided a store of experience which has been dearly bought, and there is, in addition, the experience gained by smaller companies and syndicates in the Heidelberg, Venterskroon, Klerksdorp and other fields to be considered when wonder or dissatisfaction is expressed that the capital of the Rand prefers to follow the Main Reef series. While it is possible to agree with Mr. Draper that the mining houses are unjustly charged with prejudice and a desire to belittle other lines of reef than those now under exploitation and other districts than the Witwatersrand, it can scarcely be admitted that he has fully made out his case when he asserts that "all attempts to discover new lines of reef may be set aside as beyond the region of probabilities."

VENTERSKROON STILL ACTIVE.

Even in the Venterskroon field, where prospectors and engineers have given speculators a pretty long and varied run for their money for some years past, it appears that hope is not nearly extinguished. In the last issue to hand of the *African World*, for example, Mr. W. T. Hallimond, after explaining that prospecting work carried on till recently on the properties of the "Free State Rand" has not been carried out under his control or in accordance with his directions, writes:—"I may, however, inform you that I am now in charge, and I am not one of those who have lost all faith in the possibilities of there being a payable reef existing in the Witwatersrand series, which, to my mind, is very little known in the Vredefort district. It is true geologists have gone over it time and again, and there cannot be two opinions, in the face of the evidence that exists, about its being the Witwatersrand series; but how many geologists have attempted in a proper manner to find a payable reef? At any rate, it is unfair both to the people who have put up the money for the exploitation of these fields and to the country itself to say the field is a 'failure' until the last stone has been turned in the endeavour to find a payable reef." Whether Mr. Hallimond be unjustifiably sanguine or not, however, has little to do with the truth of the proposition that insufficient evidence has as yet been obtained to confirm Mr. David Draper's sweeping condemnation of everything outside the reef claims of Rand mining companies. That gold exists in large quantities in some parts of the northern series of reefs, those in the lower Witwatersrand formation, that is to say, is, of course, unquestioned, and one need go no further than Waite's claims at Witpoortje to find ore going very many ounces to the ton. It was sufficiently rich, as we remarked some months ago, to warrant its being mined and sent as a "sweetener" to the Durban Roodepoort mill. The same values might be found at numerous other points, no doubt, outside the Witwatersrand area.

IS UNIFORMITY NECESSARY?

The feature that strikes one as being most characteristic of these outside reefs, when compared with the Main Reef series, is not so much the want of values as a deficiency in that uniformity of payability that has made it possible to mine the latter upon so large and extensive a scale over a distance of many miles. The same want of uniformity is precisely the characteristic which differentiates auriferous quartz reefs all over the world from the auriferous pebble beds of the Main Reef series, so that the statement that the outside banket reefs cannot be mined upon the same scale nor in the same manner as the Main Reef Leader or the South Reef does not suffice to demonstrate the impossibility of their ever being exploited under any conditions. That the Main Reef series is not believed to be the only payable group of bankets is shown by the fact that the Rietfontein mine, which has been worked from the earliest days, and has disclosed some phenomenally rich ore occasionally, is commonly considered to be a portion of the Elsburg series, a series which in its most extensive development south of the Rand is distinguished by its comparative poverty. It will be admitted that a good deal depends upon the sources from which the gold has been derived, and if it can be shown that there is nothing in the Main Reef series which justifies the claim of Mr. Draper, and those who support him, that it has been specially susceptible to enrichment, it follows, on geological grounds, that his indictment of other series is without adequate foundation.

THE GEOLOGICAL EVIDENCE.

The question of the origin of the gold in the Rand bankets is one which has not yet been satisfactorily settled, and the extremely interesting and instructive paper upon the subject which has lately been read by Mr. C. Baring-Horwood before the Geological Society of South Africa has reopened a discussion which may yet be fruitful in economic results. As a result of his investigations regarding the occurrence of rare metals in the Rand banket beds, Mr. Baring-Horwood has come to the conclusion that "the gold-bearing Rand bankets really differ in no important essentials from ordinary gold-bearing quartz veins; in other words, they have merely played the part of fissures, in which mineral matter has been deposited from circulating solutions; and the channels have finally become closed by the deposition of secondary silica, which is analogous to the vein quartz of an ordinary lode. The big diabase dykes, which occur in almost all the mines of the Rand, are abundant and sufficient evidence of former deep-seated communications with these channels, whence the mineralising solutions may have ascended." This is an opinion which has been largely and influentially held for a long time, although we do not remember that any one has hitherto put the matter so definitely or concisely into words. Mr. Horwood also remarks that "the barren banket beds are analogous to the barren quartz-lodes, which so frequently, also, occur in the neighbourhood of gold-bearing quartz veins." Which those barren beds are that are referred to are not specified. It follows from this argument, however, that some banket beds are likely to be more analogous to quartz reefs than others, and that the occurrence of payable patches or shoots separated by more or less barren stretches of reef are possible conditions. The existence of gold in considerable quantities in some of the outside lines of reef, and the similarity of their physical characteristics to those of the Main Reef beds are points in favour of finding ore bodies of workable extent, and until more work has been done upon them, or until more reliable evidence has been obtained as to the exclusive payability of the Main Reef series, it seems premature to assert in a dogmatic sort of way that there is nothing still to find. The Heidelberg district has been described as one in which it is scarcely worth while to spend money for prospecting purposes, but until it is explained why the Nigel areas alone should carry excellent gold values there is not sufficient justification to abandon hope with regard to other portions of the same country where the geological conditions are to all outward semblance identical.

What is really wanted is an exhaustive economic study of the various banket series of the Rand, such as can only be made by persons who are in the first place competent to do the work, and are, in the next, amply furnished with the time and means to carry it out. It is an undertaking which can well be entrusted to the geologists of the Geological Survey branch of the Mines Department, when the mapping of the Witwatersrand formation is accomplished—sooner if possible. Hitherto the researches made in this direction have been few, somewhat meagre and inadequate, and far between. Only Professor Young, and Mr. C. Baring Horwood, as a matter of fact, have gone about the business in anything like a thorough manner, and their evidence, collected in spare moments and with no small difficulty, does not disclose any ground for believing that the Main Reef series of the Witwatersrand comprises the beginning and end of the payable ore bodies in the formation.

COST OF LIVING IN THE UNION AND RHODESIA.

Interesting Comparison of Prices of Foodstuffs in the United Kingdom, U.S.A. and South Africa.

Mr. W. W. Jenkins writes from Bulawayo:—Some prominence having been given to this subject lately, I think you might find it of interest to the public to publish the accompanying list of predominant prices of ordinary foodstuffs with comparisons of the cost here and in the United Kingdom, United States and South African Union. The average quantity consumed per week given in the list herewith is that accepted by the recent Commission of Enquiry into the Commerce and Industries of the South African Union. The Commission pointed out that conditions in the United States approximated more closely to those of South Africa than did the conditions in the United Kingdom. The basis of calculation, however, is immaterial. We here have a list of certain foodstuffs essential to every household. They cost in Bulawayo £1 11s. 8d.—in the United States 18s.—in the United Kingdom 14s. 9d. to 15s. 3d. Quite possibly it may be maintained that Customs duties have no bearing on the cost of living. No figures, however, can disprove the following facts:—

(1) Sugar, cheese, flour, milk (preserved), and bacon, to mention only a few of the items given, are heavily taxed in order to boost up colonial industries which have not yet found their feet and in any case are unable to supply the whole of the country's requirements. (Sugar may in a few years perhaps be excluded from this category.)

(2) This country is paying in Customs dues on foodstuffs £44,951 per annum, equal to an average of £1 18s. per head for (to adopt the Rhodesian Treasurer's basis) every white man, woman and child in the territory, and to an average duty of 10·78 per cent. on the total value of all imported foodstuffs. It appears, however, that we took £195,000 worth of South African articles of food in 1911, and that we paid the above duty of £44,951 on necessaries of life imported from overseas to the approximate value of £220,000. This is equal to over 20 per cent. It is the price we pay for belonging to the Customs Union.

(3) The protective Customs' barrier adds to the cost of of producing local goods, and also of retailing imported goods. As stated by Mr. W. MacIntosh in his excellent minority report published with the Report of the Commission of Enquiry into the Trades and Industries of the Union: "Efforts are being made by taking specific duties singly to show that their effect on the cost of living is not great, but the cumulative effect of these duties is very great." With our long hauls from the coast and independent railway rates, it stands to reason that the "cumulative effect" is oppressively greater than it is in the South:—

PREVAILING PRICES OF CERTAIN FOODSTUFFS.

	Average quantity consumed per week.	Retail Prices.				Cost in Pence per Week.			
		U.K.	U.S.A.	S.A.U.	RHO.	U.K.	U.S.A.	S.A.U	RHO.
Sugar	5¼lbs.	2d. per lb.	2¾d.	2½d.	4d.	10½	15	13	21
Cheese	½lb.	7d. per lb.	10d.	1/3	1/6	3½	5	7½	9
Butter	2lbs.	1/1¼ per lb.	1/4d.	1/3	2/-	26½	33½	30	48
Potatoes	21lbs.	3d. per 7lbs.	5¾d. to 8¼d.	7d.	1/6	9	21	21	54
Flour	10¼lbs.	8d. to 10d. per 7lbs.	11½d. to 1/1½	1/5½	2/4	13¼	18¼	25½	41
Bread	8¼lbs.	4½d. to 5½d. per 4lbs.	10¾d. to 11½d.	1	1	10¼	23	25	25
Milk	5⅓qts.	3d. to 4d. per qt.	4½d. to 4¾d.	4½d.	10d.	18¾	24	24	53
Beef	5¾lbs.	6¾d. per lb.	6d. to 8d.	7d.	10d.	45½	47¼	47¼	57½
Mutton	1¼lbs	6⅜d. per lb.	6½d. to 8¼d.	6d.	10d.	8	9¼	7½	12½
Pork	2¼lbs.	7½d. to 8½d. per lb.	5¾d. to 7¼d.	8d.	10d.	18	14¾	18	22½
Bacon	1¾lbs.	7d. to 9d. per lb	8½d. to 10½d.	1/2	1/9	14	16¼	24½	37
						177¼	227¼	243¼	380½

FEATURES OF RECENT MINE PROGRESS.

The April Returns—Points in the Chamber of Mines Analysis—Some Prominent Results—Comparative Figures for 1911 and 1912.

During the last six months the Brakpan mine has increased its monthly crushing by nearly 10,000 tons and its profits by nearly £10,000. The following figures show an expansion which is as creditable to the company as it must be gratifying to shareholders:—

	Tons Milled.	Revenue per Ton.	Expenses per Ton.	Total Profit.
November	39,688	28 7	18 1	£20,152
December	40,090	28 7	18 3	20,114
January	41,060	28 6	18/ 1	21,373
February	42,177	28/11	17/ 9	23,223
March	46,782	30/ 6	17/ 7	26,119
April	48,173	30/ 6	17 7	46,922

From the £46,922 profit recorded for April must be deducted the sum of £15,973, reserves extinguished, leaving a balance of £30,949, which is a marked advance on previous months.

The City Deep, also, shows a noteworthy improvement over a similar period as the table herewith makes evident:—

	Tons Milled.	Revenue per Ton.	Expenses per Ton.	Total Profit.
November	41,290	30 10	22 4	£16,748
December	37,100	34 11	24 5	18,882
January	37,860	32 9	22 0	19,510
February	37,940	32 5	22 2	18,783
March	40,030	33 6	22 10	20,462
April	39,000	34 11	23 4	21,608

While the tonnage is less than it was in November last, the profits are considerably higher, in spite of the fact that costs have risen somewhat.

The City and Suburban is in a similar position, with lower tonnage and higher working costs. The advance is strikingly shown in the brief statement which follows:—

	Tons Milled.	Revenue per Ton.	Expenses per Ton.	Total Profit.
November	27,007	31/ 1	18 11	£17,099
December . . .	24,050	35 11	22/ 2	17,000
January	27,124	32/ 2	21 3	17,788
February ...	26,112	37/ 3	21 11	19,226
March . . .	26,545	37 3	22 2	46,150
April	25,539	38 5	22 10	20,372

At the East Rand Proprietary Mines, the progress of which is, naturally, attracting no small amount of attention, there has been a material diminution of tonnage milled, accompanied by a falling-off in recovery as compared with February, while costs have been slightly lowered, as will be seen from the accompanying statement:—

	Tons Milled.	Revenue per Ton.	Expenses per Ton.	Total Profit.
November	168 853	25 4	19 9	£50,000
December	162,876	28 9	19 4	78,992
January	164,550	28 3	21 1	67,108
February .	144,200	33 0	22 8	75,609
March	163,000	33 7	21 5	101,362
April	157,500	32 11	21 1	98,596

The net result has been a working profit of 12s. 6d. per ton milled, which is higher by one penny than that of March. The reduced tonnage accounts, of course, for the diminished working profit total of £98,596. The percentage of sorting, it may be remarked, is being steadily raised, the figures for the last three months being, respectively, 7·61, 9·25, and 10·49.

The Ferreira Deep is a company which has shown an upward tendency lately, albeit if somewhat irregular, and in view of the amalgamation proposals the record of the past half-year will be of interest:—

	Tons Milled.	Revenue per Ton.	Expenses per Ton.	Total Profit.
November	30,020	44/ 7	22 2	£32,804
December	28,400	42/ 2	23/ 3	29,257
January	27,750	41/10	25/ 0	22,599
February	29,140	47/ 5	24/ 7	32,599
March	33,950	45/ 6	22/10	37,612
April	32,310	47/ 7	22 10	40,612

At the special general meeting the other day, the Chairman, Mr. H. A. Rogers, said: "The prospects of the Ferreira Deep have quite changed; you will have noticed that the profits for the last two months have increased, and everything tends to show that this will be maintained, and I think recent returns will be improved on."

The Meyer and Charlton stands out prominently among those mines which have been making improved returns lately, and little in the way of comment need be added to the following very satisfactory statement:—

	Tons Milled.	Revenue per Ton.	Expenses per Ton.	Total Profit.
November	13,378	37 1	17/10	£12,908
December	13,811	37 3	17/ 1	14,008
January	14,064	35/ 1	17/ 5	14,991
February	13,118	40/ 3	18/ 4	14,386
March	14,290	47/ 8	17/10	17,094
April	13,800	49/ 1	17/ 7	17,488

At the New Goch, on the other hand, the anxiously-awaited improvement shows no sign of materialising at the moment, and profits have fallen still further in April. The accompanying figures are far from gratifying:—

	Tons Milled.	Revenue per Ton.	Expenses per Ton.	Total Profit.
November	29,646	22 9	16 6	£9,083
December	31,352	21/ 0	15 11	7,769
January	30,362	21/ 1	16 1	7,533
February	24,048	22 0	19 4	3,164
March	25,225	22/ 0	18 10	3,966
April	24,792	20 10	18/ 5	2,951

In March last it was stated that the February profit was "reduced in consequence of small tonnage, due to unfavourable underground conditions, which are expected to be of a temporary nature."

The Nourse Mines has been increasing its tonnage milled and recovery, while reducing working expenditure, with the result that profits have risen from £18,553 to £21,678 during the last six months, or from 7s. 10d. to 9s. 7d. per ton milled.

The Randfontein Central made a bigger profit in April than in the previous month, this result being obviously due to an improvement in the grade of ore milled. There was a good deal less of it, however, although sorting was not increased. The following table gives the form of this company at a glance:—

	Tons Milled.	Revenue per Ton.	Expenses per Ton.	Total Profit.
November	204,531	24 0	16 6	£77,000
December	208,005	24 1	17/ 0	£74,000
January ...	215,556	24 3	17/ 5	74,000
February	211,113	23 6	17/ 4	65,000
March	229,642	22 5	17/10	53,000
April	199,518	23 8	17 10	58,000

Financial papers in London are beginning to express themselves in a decidedly unsympathetic sort of way, as these remarks from a recent issue of *The Statist* to hand sufficiently testify: "We understand that French investors, who hold Randfontein securities to a very large extent, are expressing increased dissatisfaction at the meagreness of the information afforded to shareholders. It is curious to notice, however, that whereas in respect of the East Rand the French clamoured for and secured the election of three representatives, there has been no action taken on their part to obtain representation on the Randfontein group. If those who hold the reins had been able to bring about verification of their predictions, there would be substantial reasons for maintaining the *status quo*, but it is now beginning to be increasingly expressed that there is necessity to bring about modification. What practical shape the dissatisfaction will take remains to be seen. At present there is grumbling, denunciation and dissatisfaction, but no action, apparently, has seriously been initiated."

It is instructive to compare the Witwatersrand totals and averages for the month of April, 1912, with those for the same month of last year, as shown in the Chamber of Mines monthly analyses. The figures relating to tonnage and stamp capacity are:—

	Tons Hoisted.	Sorting per Cent.	Tons Milled.	Stamps Running.	Duty per 24 hours.
1911—April	2,178,865	13·06	1,926,583	9,355	7·80
1912—April	2,375,002	12·72	2,059,562	9,416	8·31

The number of tube mills at work during the same periods were, respectively, 206 and 256. In the case of the 1912 figures there were 56 companies sending in returns as against 55 in the previous April.

The recovery returns are summarised thus:—

	Total (excluding Accumulations).	Per Ton Milled.		
		s.	d.	dwts.
1911 April	£2,711,840	27	7	6·50
1912—April	3,002,140	28	6	6·72

How far the increase shown is due to an actual improvement in recovery and how much to the fact that reserve gold is not now carried is not apparent. From the comparative sorting percentages, taken in conjunction with the returns for last January, one is led to infer that the reserve gold factor accounts for the better results recorded.

Costs and profits compare as shown below:

	Total Working Costs per Ton milled.		Working Profit.	Working Profit per Ton milled.	
	s.	d.	£	s.	d.
1911—April	17	7	971,858	10	1
1912—April	19	0	1,005,920	9	8

The total working profit quoted for last month has been increased, from £989,947 to the sum given, by the inclusion of the £15,973 above referred to as representing gold reserve extinguished by the Brakpan Mines. This amount is not included, however, in the working profit per ton milled, nor in the per ton milled figures of the statement immediately preceding.

NEW DEATH DUTIES AND THE INDUSTRY.

Attitude of the Chamber of Mines—Appeal to the Government.

THE Transvaal Chamber of Mines has naturally taken up the question of the new Death Duties Act. The amendment introduced by the Minister of the Interior to the taxation proposals imposing death duties, by which a special "compensation duty" (as it is called) of one-quarter per cent. per annum is to be paid by companies carrying on business in South Africa in respect of any stock of a company issued in favour of a bearer, and in respect of any stock registered in the name of a company or body incorporated outside the Union. It is proposed that this duty should be payable on the market value and not the face value of the stock affected. In the amendment the new duty is described as being in lieu of the fixed duty of 5 per cent. to be payable on the death of a holder resident outside the Union, upon the market value of any shares held at the date of his death. The Chamber of Mines has made very strong representations to the Government both in regard to the fixed duty, and, more particularly, in regard to the special "compensation duty." It was pointed out that South Africa, in common with other countries in a similar position, stood greatly in need of capital for its development, and that it was usual for countries in this position to endeavour to attract capital by the holding out of inducements for its employment and not by legislating making for its penalisation. It was urged that the one-quarter per cent. per annum on the market value of the shares affected would in itself be a very serious increase in the taxation of the profits of companies; but, apart from this, the Chamber submitted that the proposal would be viewed with very grave apprehension by European financial institutions as being an attempt to impose taxation on the citizens of a foreign country. At the meeting of the Chamber last week, the President said that it was further pointed out that the "compensation duty" in the amendment referred to is said to be in lieu of the fixed duty, whilst shares of South African companies circulating in France, to quote a concrete case, require to be bearer shares in order to be good delivery, and consequently shares which might have been circulating in France for a number of years and have had to pay the one-quarter per cent. duty on the market value would, upon subsequent transfer into registered stock here or in England, still be liable to the full fixed duty of five per cent. upon the death of the registered holder. Various other disabilities which would be imposed under the new law were also pointed out, including the impossibility under certain conditions of making the actual holders of the stock affected pay the duty, with the result that the company itself would have to bear the burden of the tax.

The President concluded: "As you will have seen from the newspapers, strong representations have also been made by various Continental banks and other financial institutions regarding the proposals in question; and it can only be hoped, in the best interests of the country, that the proposed legislation may yet be withdrawn or very materially modified."

Robinson G.M.

The Robinson Company's mine store has now its own telephone connection with the Exchange, and the number is 4478.

Reuter's Pretoria correspondent reports that 62,077 bags of maize were exported overseas from the Union during April, making a total for the first four months of the year of 126,527 bags, as against 229,633 for the same period of 1911.

ILLOGICAL PRECISION IN MINE REPORTS.

A Plea for Precision in Engineers' Phraseology.

Some little while ago Mr. T. A. Rickard presented to the Institution of Mining and Metallurgy a paper of somewhat remarkable nature, in which an eloquent plea was made for the use of better, if not more classical, English in technical literature. Mr. F. Percy Rolfe has recently read before the same Society a somewhat kindred contribution, but it is more of a commercial nature and less of a grammatical plea than Mr. Rickard's work. Mr. Rolfe's paper is entitled "Illogical Precision in Mine Reports," and it might be said to complete some of the trains of thought suggested by Mr. Rickard's demand for purer English and more logical statements in the official bulletins of mining engineers. The following are extracts from his contribution:—"In drawing attention to the prevalent custom of expressing large tonnages to the extreme accuracy of a single ton, and of reporting mine assays to excessive minuteness," says Mr. Rolfe, "the writer will endeavour to show that these practices are, in themselves, inconsistent, and that the results can be expressed with the same degree of accuracy and a much greater degree of mathematical reason by approximations in the shape of simpler 'round' figures." The ore reserve of a mine is the sum of the tonnages of ore contained in the several blocks sufficiently exposed in the mine to admit of some recognised system of measurement. In the calculation of each of these integral blocks, however, there must enter, from the first, elements of uncertainty, and the importance of some of these doubtful elements will be emphasised in this paper. As a practical justification for developing this argument, it may be enquired how many cases have occurred in which the tonnage of ore stoped from a particular block has been equal to the number of tons originally estimated as contained in the block. The writer ventures to say that this has happened in very few instances indeed. Close approximations may have been arrived at in a few cases with some of the most uniform ore-bodies known, but in dealing with the so-called "impregnation" deposits found in Western Australia, Rhodesia, and some parts of the United States, it can only be said that even a close approximation is a matter of accident.

In view of the foregoing statements, which all have reference to but one of the integral parts of the ore reserve of a mine—viz.: a single block of ore—it is unsound, and, moreover, mathematically improper, to express a large *total* tonnage in terms of units. In order fully to consider the accuracy of an ore reserve statement, it may be well to imagine the case of a mine which has a certain tonnage blocked out, no development work having been done since the date on which the estimate was made. When this ore is completely extracted and treated, will the mill returns show that a tonnage equal to the ore reserve has been crushed, and that the gold recovered, added to that lost in the residues, is equivalent to that given in the same estimate? Probably no mining engineer would expect such an agreement, and if there were a variation of less than 5 per cent., it might be considered in the light of a fortunate circumstance.

Some published statements of ore reserve tonnages, taken at random from the mining technical Press, will illustrate the unnecessary refinement which is so prevalent in this connection. For instance, a Rand mine gives its reserve as 2,788,099 tons. The final 9's compel attention, and one wonders why the tonnage could not at least have been given as 2,788,100. As a matter of fact, 2,788,000 tons would have expressed the ore reserve just as accurately, and it is probable that 2,790,000 would also be easily within the limits of error. Another Rand mine gives the figure 1,775,175, but it is pleasing to see a third mine in the same district publishing 7,300,000 as its ore reserve. This latter is the only round number with reference to the Witwatersrand that the writer remembers having noticed. Rhodesia provides the curious instance of a huge ore-body, which on the first level averages 71 feet wide and increases to a width of 110 feet on the second level, in which the ore "blocked out on four sides" is stated to amount to 1,019,113 tons. The percentage of error which may creep in when estimating the average width of this ore-body has only to be imagined. This is a notable example of carrying out a calculation to an excessive number of units.

In dealing with the question of reporting mine assays, it is intended to give a few published figures in order to illustrate the writer's argument. It must be borne in mind that many mines assay their underground samples to the nearest pennyweight only, and that in any case it is not practicable to assay them to a greater accuracy than ½-dwt.—or, if reporting in money is employed, 2s.—per ton. Yet assays of faces are very frequently reported to a single penny, and it is a matter of wonder how it has been found within the bounds of economy or practicability to assay to such a degree of refinement. If the question of probable errors in sampling be taken into account, this style of reporting becomes even more remarkable. To quote an instance, the following assay results are all published in one monthly report, each assay being the value of an individual face:—2s. 3d., 3s. 5d., 3s. 7d., 5s. 2d., 5s. 3d., 5s. 9d., 7s. 4d., 7s. 9d., 9s., 9s. 3d., 9s. 7d., and 9s. 9d. It must be reiterated that each of these is an individual assay, not an average; judging from the fact that one face assays 5s. 2d. and another 5s. 3d. it is to be inferred that the assaying on this mine is carried out to the incredible accuracy of one penny. It must be asked what is the merit of reporting such figures—especially 2s. 3d., 3s. 5d., and 3s. 7d. What useful purpose would these latter assays serve, even if the offending pence were eliminated? Assuming them to be strictly accurate, their exactness is of no economical value for the reason that, for all mining purposes, ore of this grade is the equivalent of barren rock. This system of calculating an average to a greater degree of accuracy than has been observed in making any of the component assays is, however, a wrong one, for it contravenes a simple mathematical principle. The writer has not been able to find this principle definitely stated as a law in a mathematical textbook, but it would appear only a matter of common sense that, in determining the mean of a number of quantities, the result should be expressed to the same degree of accuracy as that observed in measuring the several quantities.

Australian Diamonds.

Mr. Daniel Grove, F.R.C.I., who claims wide African experience, has furnished to the New South Wales Premier an interesting report on the diamondiferous country about Inverell, in the northern portion of the State. Mount Donamia (Oakey Creek), where a party is searching for the precious gems, he says, presents a well-defined diamondiferous fissure in granite walls overlaid by tin-bearing alluvial, carrying diamonds. The behaviour of the matrix in the matter of its rapid decomposition is identical with that of South African diamond matrices. He recommends that the two discoverers should have a grant of the mine free from the usual conditions, as a reward for research. "It is my opinion," says Mr. Grove, "that the Oakey Creek fissure is only one of a series intersecting the granite throughout the New England district, and especially in the area between Tingha and Bingara."

The Societe d'Entreprises au Katanga is being wound up. It was formed on July 20, 1910, with a capital of one million francs. The head office was at Brussels, with a branch at Elisabethville.

POSSIBILITIES OF THE SHALE OIL INDUSTRY.

Lessons from Scotland—Great Output of Oils and By-Products—Increased Importance Since the Coal Strike—How Paraffin Wax is Made.

The Transvaal, amongst other undeveloped resources, possesses a potential shale-oil industry, which has much to learn from the example of the industry in Scotland. The Scottish shale-oil trade has had many vicissitudes. It was begun in 1850, and since then has passed through many stages. Of recent years the various companies have had a run of prosperity. One company for a number of years paid dividends of 50 per cent. annually, others paid 15 per cent. There had been a set-back owing to increased competition of foreign oils, and consequently a lowering in prices, but since the great coal strike, however, all oil business has taken a bound forward and prices have risen again. Scotland is so far the only country in the world where oil-shale is worked profitably, but various endeavours are being made in other lands to refine shale, and in Southern Europe a shale works is being established on similar lines to the Scotch works. It was the late Mr. James Young, LL.D., who initiated the Scotch shale industry. This was at Addiewell, and his firm, bearing his name, is therefore the oldest in the trade.

According to the *World's Work*, there are seven companies engaged in the trade. These are united for consultation purposes under the name of the Scottish Mineral Oil Association, but their works are carried on independently of each other, and as yet no agreement has been come to with regard to combining for selling purposes. Six of the companies are registered, viz., Young's, Pumpherston, Broxburn, Oakbank, Dalmeny, and Tarbrax. The other, Messrs. James Ross & Co., of the Philpstoun Oil Works, is a private concern. Over three million tons of shale are produced annually, and it is computed that in addition to a large number of men engaged in other industries which provide these companies with fuel, chemicals, plant and general stores, the Scottish shale-oil companies regularly employ in their own mines and works about 10,000 men, and pay nearly one million pounds sterling per annum in wages. From the shale, a hard black slaty substance, are produced not only oils but other manufactures. Of the chief products the aggregate quantities for the year 1910 may be taken in round figures as: Burning oils, 20,000,000 gallons; naphtha, 5,000,000 gallons; lubricating and gas-making oils, 22,000,000 gallons; solid paraffin wax, 25,000 tons; sulphate of ammonia, 54,000 tons. Motor spirit is also being made in considerable quantities, and commands a ready sale. Candles are supplied in all qualities, the dearer sorts being elaborate works of art.

The oils are subdivided as: Burning, lighthouse, gas-making, gas-enriching, grease-making, fuel oils for oil engines and oil-burning boilers, cleaning and batching oils. Naphtha is sent out for dry-cleaning purposes, and as solvent naphtha, and naphtha for burning. A most valuable commodity, at first merely considered a by-product, but now regarded as a mainstay for profit earning, is sulphate of ammonia. This scientific fertiliser is shipped abroad largely. Japan and the United States are important buyers, and prices are at present good. To understand the work of a shale-oil concern, a description of the methods in force at one of the largest oil works will be of interest. The Pumpherston Oil Company was started in 1882, and now deals every year with an enormous quantity of crude oil. There are three works—Pumpherston, Seafield and Dean's. These all have separate crude oil and sulphate of ammonia producing plant, but the oil and wax refineries are centred at Pumpherston, the crude oil being conveyed thence in railway tank-wagons, as is also the crude oil from the Tarbrax Company's retorts. The Pumpherston works cover 100 acres, and the mineral fields extend to many thousands of acres.

Breaking Up the Shale.

At Pumpherston the shale is conveyed from the mines by endless wire-rope haulage, and after being broken up in breaking machines, is lifted by hutches to the top of the retorts. The shale then falls into a hopper or magazine communicating directly with the retorts, and having twenty-four hours' storage supplies. These patent retorts are of the most approved type, and are cylindrical in shape, and built vertically in ovens of four, each oven having four chambers. The upper portion is of cast iron, 11ft. long by 2ft. diameter at the top, enlarged to 2ft. 4in. at the bottom; the lower portion is of firebrick, 20ft. long by 3ft. diameter at the bottom. Heat is applied externally from the incondensable gases obtained from the distillation of the shale, occasionally assisted in the case of the poorer qualities of shale by producer gas, and circulates round the retort. The heating gas enters at the bottom of the retort along with a certain quantity of air, and the very high temperature is maintained in the brick portion of from 1,200° to 1,600° F. This converts the nitrogen of the shale into ammonia, which is preserved by a continuous supply of steam delivered at a slight pressure into the bottom of the hopper. The oil gases are distilled from the shale in the cast-iron portion at a temperature of about 900° F., and along with the ammonia gases are drawn off by exhausters through the huge atmospheric condensers. The condensed liquid oil, and water containing ammonia, flow into a separator tank, and by their difference of specific gravity they assume different levels, thus rendering it an easy matter to draw them off into separate tanks. The gases then pass through ammonia scrubbers in which they are "washed" for ammonia, then through the naphtha scrubbers where the lighter gases, which could not be caught in the atmospheric condensers, are washed with oil, and a good quality of light oil or naphtha recovered. In the manufacture of that highly prized fertiliser, sulphate of ammonia, the ammonia water got from the atmospheric condensers is pumped through a heater, in which it is raised in temperature by the hot waste water flowing from the still, and passes into the top of the still. This still is circular in shape, thirty feet high, and has a series of cast-iron trays fixed horizontally every two feet from the top to near the bottom.

Steam enters the bottom of the still at a pressure of 40 lb., and passes to the top through a series of conical paps cast on the trays and covered by hoods, carrying with it the volatile ammonia, while the water, after traversing each tray in a downward direction, flows out at the bottom as spent water into a tank containing a cast-iron worm, this being the heating tank for the ammonia water on its way to the top of the still. The steam and ammonia gas liberated in the still pass into a large lead-lined tub or saturator. By running sulphuric acid into this tub, sulphate of ammonia is formed at a certain temperature. Steam ejectors blow this sulphate out into hutches, and the solid sulphate is conveyed by an overhead railway to drying-stalls to be afterwards packed up and despatched to market. As evidence of the care exercised in allowing nothing to be wasted, it may be remarked that the exhaust steam and waste gases from the saturator are passed into the retorts and utilised for the formation of ammonia from the shale, while even the spent water is thoroughly filtered. Many distillations and treatments are necessary in refining the crude oil which is obtained from the retorts. This is, of course, essential owing to the various grades and qualities of oils made. But a description of the first process will suffice, as the various stages of distillation are carried through in almost identically the same way as that of crude oil. Large tanks at Pumpherston receive the crude oil, and from these it is delivered into the stills by gravitation. The oil is fed into the centre boiler of a battery of oil boilers. The lightest fraction of the crude oil—to be converted ultimately into naphtha and paraffin—is distilled off the feeding boiler, and condensed in a coil of cast-iron pipes immersed in cold water in a tank. The boilers on each side of the feeding vessel receive their oil by a pipe connecting with the bottom of the latter, and they also distil over the lighter portion of the oil with which they have been fed, the heavier portion passing on to another boiler, where the process of distillation is repeated. The oil now left is delivered into a cast-iron pot-still in which it is ultimately distilled to dryness, the residue left forming that valuable fuel, oil coke, which has a high percentage of fixed carbon and low yield of ash. At all distillations steam is admitted in large quantities.

The treatment or washing of the oil, to remove impurities that cannot be eliminated by distillation, consists in stirring the oil by compressed air with a fixed quantity of sulphuric acid, and running off the heavy mixture of tar and acid which separates. The acid-treated oil is then run into another similar vessel, treated with a solution of caustic soda, and the soda tar, which separates, run off. The acid tars are steamed and washed, the resulting acid water being sent to the sulphate of ammonia house for the manufacture of sulphate of ammonia, whilst the tar is mixed with that from the soda treatments, and burned under the stills as liquid fuel. Here again is seen the wonderful care exercised in making use of all waste, for this tar used as fuel is sufficient to distil all the oil at the various stages, thus saving much cost of fuel. Probably the most interesting, however, of the numerous processes going on simultaneously in the refineries at Pumpherston is the converting of that black slaty substance, shale, into that most beautiful of things, paraffin wax. To place a piece of hard coal-black shale alongside a virgin white or delicately tinted wax candle is indeed to emphasise what the scientific mind can accomplish.

Making Paraffin Wax.

A portion of the oil distilled at the second distillation, or as it is technically called, the green oil stage, is sent from the stills to the paraffin sheds. Pumped into a cooler, the oil is frozen into a pasty mixture of liquid oil and solid crystals of wax. This mixture is then pumped into filter presses, where, under pressure, the oil flows off and the wax is left behind in solid cakes. After further compression under hydraulic presses, the material—now taking the name of paraffin scale—has to undergo a process of sweating by steam heat to remove the traces of oil that yet discolour it. In the sweating stoves are large iron trays with false bottoms of iron lattice work, into which water is pumped to cover the lattices. About two inches of melted scale is pumped into each tray, and after it is cooled and solidified the water is run off, the doors of the stoves are shut, and the temperature gradually raised by passing steam through coils. As the scale heats it expands and becomes porous, and the small quantity of yellow oil comes out. The scale, through the removal of this oil and some of the lower melting-point wax dissolved by it, becomes whiter and of higher melting-point. When the desired purity of colour is attained the temperature of the stove is quickly raised by blowing open steam into the trays through perforated pipes, and running the liquid wax into connecting vessels. Here it is steamed with open steam, and after being pumped into another vessel it is stirred with a decolourising powder to remove the last traces of yellow colour, and finally passed through filter-paper and run into moulding trays. Electric power is everywhere utilised all over the works, and there is a large private power station at Pumpherston. As steam is a very necessary auxiliary in the refinery, a battery of seven steam boilers, fitted with revolving chain-grate stokers, is installed near the power-house. Within recent years distribution in bulk has come into favour. The oil is sent in railway tank-wagons to all populous centres, and there taken to customers in road tank-carts. The Pumpherston Company were the first oil company in Scotland to put motor tank-carts on the road delivery duty. And the Scotch companies have to face keen competition, as imported oils are also delivered from tank-carts in the chief Scottish cities.

Write for List 495.

TURBINE
PUMPS

Pulsometer Engineering Co. Ltd.

11, Tothill Street, LONDON.
9 Elms Iron Works, READING.

AGENTS FOR THE TRANSVAAL:
HARVEY & CO., LTD., Johannesburg.

Sir Lionel Phillips, Bart., will pay a visit to England at the end of the session before returning to the Rand.

Among visitors to the Rand from the outside districts this week were Mr. J. I. Jameson, A.R.S.M., from Leeuwpoort, and Captain Barnard, Sabie.

Delagoa Coaling Installation.

The automatic coal-loading patent which has been registered by Mr. G. Provay, of the Port Department, has been finally accepted by the Delagoa Bay Government, and a sum has been placed on the estimates for the ensuing year for the manufacture in Europe of a complete plant to be utilised on the reconstructed wharf. It is expected that the plant will be in full working operation within twelve months from now. The working model of the patent is presently receiving the finishing touches, and it is possible that a public demonstration of the practical utility of the invention may be given at an early date.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

UNION MINING STATISTICS FOR APRIL.

Gold, Silver and Coal Production—Development Returns—Accidents and Explosive Figures.

The usual monthly returns, compiled and issued by the Government Mining Engineer's Department, of the principal mineral production of the Transvaal and the Union are as follows:—Total value of mineral output, gold, silver, coal and other metals and minerals, excluding diamonds, for April is £3,363,717.

The Gold Production.

For April the Government returns of the gold output of the Transvaal Record a total of 739,684.57 ozs. of fine gold of a value of £3,141,982, the contribution from other Provinces being: Cape, 3 ozs., value £13, and Natal 66.29 ozs., value £282. The summary of production for April is:

	Ozs.	Value. £
Witwatersrand	706,688.896	3,001,824
Outside districts—		
Heidelberg	7,421.770	31,526
Klerksdorp	2,801.412	11,900
Ottoshoop	114.170	485
Barberton	7,782.991	33,061
Pilgrim's Rest	14,569.059	61,885
Pietersburg	306.270	1,301
	739,684.570	3,141,982
Cape	3.000	13
Natal	66.290	282
	739,753.860	3,142,277

In the detail of sorting the system of tabulation sets out that the producing mines on the Rand sorted out during April 12.87 per cent. of the tonnage mined as against March 12.88 per cent., February 10.03 per cent., January 12.76 per cent., December, 1911, 12.32 per cent., November, 12.65 per cent., 13.16 per cent. for October, 12.78 per cent. for September, 12.59 for August, 13.05 per cent. for June, 13.05 per cent. for May, 13.22 per cent. for April, 14.49 for March, 13.83 for February, and 13.66 for January. The tonnage milled on the Rand amounted to 2,070,225 tons and for the whole of the Transvaal 2,143,143.

Rock Drills.

The average number of machine drills in use in the gold mines during each month for the past thirteen months was:—

1911—	
April	4,057
May	4,201
June	4,286
July	4,329
August	4,412
September	4,417
October	4,580
November	4,653
December	4,671
1912—	
January	4,791
February	4,761
March	4,689
April	4,665

of which 4,608 were on the Rand, 49 at Heidelberg, 17 at Klerksdorp and 15 at Barberton.

Development.

For all districts the figures for ore handled and treated during April are:—

	Rock Hoisted. Tons.	Rock Milled. Tons.
Witwatersrand	2.361.373	2,070,225
Heidelberg	20,058	18,078
Klerksdorp	11,405	9,923
Ottoshoop	615	615
Barberton	23,514	18,830
Pilgrim's Rest	23,615	24,060
Pietersburg	1,412	1,412
	2,442,019	2,143,143

The number of feet driven on development on main drives and crosscuts was: On the Rand 39,331, and in outside districts 10,595. On main shaft sinking on the Rand a total of 3,822 feet in depth was attained, and in outside districts 272 feet. Other development on the Rand accounted for 23,782 feet, and in outside districts 1,636 feet.

Fine Silver Declared.

The returns of fine silver produced begin from the commencement of the statistical year, July 1, 1902. The declared weight and value are appended:—

	Ounces Fine Silver.	Value. £
Statistical year, 1902-3	280,997,219	29,215
Statistical year, 1903-4	406,679.944	45,111
Statistical year, 1904-5	476,085.975	54,221
Statistical year, 1905-6	574,485.878	70,704
Statistical year, 1906-7	690,731.853	92,874
Statistical year, 1908-9	798,316.556	84,686
Statistical year, 1909-10	801,657.721	85,807
June-December, 1910		55,650
Year 1911		98,507

1912—	£
January	8,735
February	8,321
March	9,291
April	9,525

Coal Production.

The number of mines producing coal in the Transvaal is returned at 32. The quantity sold was 398,092 tons for the month, which shows a decrease of 2,353 tons as compared with the previous month. The total value of the coal at the pit's mouth is given at £88,918, which is an increase of £723. The details of the production for April are:—

	No. of Collieries.	Tons sold.	Value. £	Value per ton. s.	d.
Springs	5	60,150	16,233	5	4.77
Middelburg	15	302,579	65,983	4	4.27
Other districts	12	35,363	6,792	3	10.10
	32	398,092	88,918	4	5.61

The percentage of waste sorted out was 16.5

Union Returns.

	Coll.	Tons. sold.	Value. £	Value per Ton s.	d.
Transvaal	32	398,092	88,918	4	5.61
Cape	8	6,261	3,652	11	7.99
O.F.S.	5	43,293	11,767	5	5.23
Natal	19	224,126	63,122	5	7.59
Totals	64	671,772	167,459		

Copper.

The output of marketable produce for April was:

	Tons.	Pure metal per cent.	Tons.	Value shipped.
Transvaal	57.17	52.5	131,333	£4,300
Cape	1,488.00	49.68		
	1,545.17		131,333	£4,300

Tin.

The marketable output of tin for April was:—

	Tons.	Pure metal per cent.	Tons.	Value shipped.
Transvaal ...	243,656	66.52	216,782	£26,782

Other Minerals.

Minerals other than gold, coal, copper and tin for April:—

Transvaal.

Mineral.	Tons.	Value.
Graphite	3.177	£83
Magnesite	44.000	100
Lead	66.000	549
Lime	5,739.000	9,769
Flint	112.000	740
	Ozs.	
Silver in gold bullion	80,006.694	£8,961
Silver in other minerals	5,636.000	544

UNION OF SOUTH AFRICA.

Minerals.	Tons.	Value.
Asbestos	85.093	£1,303
Graphite	3.1777	83
Magnesite	44.000	100
Lead	66.000	549
Lime	6.110.000	10,599
Flint	112.000	740

Total Mineral Output:—Gold, £3,142,277; silver, £9,525; coal, £167,459; base minerals, £44,456; total, £3,363,717.

ACCIDENTS.

From the table of accidents the following extracts for the past thirteen months are reproduced; the total number of separate accidents for April being 203 for the Transvaal, and for the Union of South Africa 232. The accident figures for the Transvaal are:—

	Separate Accidents.	Killed. White.	Killed. Coloured	Injured. White.	Injured. Coloured.
1911.					
May		8	80	35	113
June		8	56	36	149
July		6	66	27	126
August		11	85	21	137
September		6	61	26	137
October		7	73	37	122
November		10	68	31	142
December		4	32	26	101
1912.					
January	105	3	59	33	149
February	216	7	70	25	161
March	234	4	85	33	165
April	203	3	51	24	160

EXPLOSIVES.

Appended is a summary of the statement showing the quantity of explosives issued to mines during April:—Transvaal, 23,173 cases; Cape, 35,980 cases; Natal, 21,575 cases; total, 80,728 cases.

LABOUR STATISTICS.

The following figures supplied by the Government Mines Department show the total number of persons in the service of companies and companies' contractors in the Transvaal and Union, but do not include a certain number of coloured convicts employed on the Witwatersrand area:—

GOLD MINES.

	White.	Coloured.
Witwatersrand	23,968	202,784
Heidelberg	228	2,799
Klerksdorp	97	1,001
Ottoshoop	6	80
Barberton	267	3,349
Pilgrim's Rest	295	4,657
Pietersburg	19	263
	24,880	214,933

The total for coloured labour on the Witwatersrand does not include 605 coloured convicts.

YEAR'S PROGRESS.

The following table of numbers actually in the employ of companies and companies' contractors shows the progress of labour for the whole Transvaal for the last thirteen months:—

	Gold Mines. White.	Gold Mines. Coloured.	All Mines. White.	All Mines. Coloured.
1911—				
April	25,979	211,135	27,876	238,051
May	26,111	209,913	28,010	237,376
June	25,960	206,197	27,850	233,598
July	25,780	201,485	27,668	229,071
August	25,632	198,332	27,521	225,105
September	25,431	196,421	27,332	224,084
October	25,329	196,019	27,214	223,171
November	25,157	195,073	27,033	221,113
December	25,114	194,336	26,978	218,811
1912.				
January	25,224	198,595	27,116	223,227
February	25,212	204,923	27,146	231,459
March	25,151	211,592	27,130	239,861
April	24,906	215,148	26,907	245,642

Grand total of the numbers in service of Transvaal mines, 272,549.

UNION TOTALS.

	White.	Coloured.
Transvaal	26,907	245,642
Cape	2,938	18,732
Orange Free State	1,240	12,871
Natal	542	11,033
	31,627	288,278

THE ECONOMICS OF TUBE MILLING.

Mr. H. S. Ball Replies to His Critics.

In replying to the criticism of his paper on this important subject, Mr. H. S. Ball, at the last meeting of the Institution of Mining and Metallurgy, expressed regret that two of the most interesting points, *i.e.*, "the transition period of the mill," and "the use of transition moisture samples," escaped all discussion. Mr. Ball remarked: Several of my critics have expressed surprise at deductions being made in some cases from only three or four tests—of them I would ask: "With a scarcity of time and material and a wide field of investigation to cover, is it not advisable to make every deduction possible from the available data rather than to be content with merely noting the self-evident facts?" In answer to Mr. James' query regarding the "critical point of moisture," I would refer him to the moisture tests; from these he will see that it was only possible to run four actual tests, the remaining points on the "moisture efficiency curve" being obtained from the "transition samples," the running of tests with a 0.5 per cent. change of moisture each time being scarcely practicable. I agree that, by changing the brushes on the motor in order to alter the speed, the motor tends to run uneconomically, but even neglecting the power, it will be seen that at a speed of 37 rev. per min., the best grinding takes place. Taking the points Mr. Truscott raises in order, I would point out again the impossibility of carrying out a more extensive investigation with a limited time and material that I had at my disposal. The reference to the capacity of a plant being increased 1 per cent. by the use of quartz pieces will be found in "Mines and Methods," October, 1909. I agree with Mr. Truscott that the h.p. for Test "A' should read 4.8, but as this test was a trial one, and its results not made use of until the curves had already been plotted, no value was given to the power absorbed. For this reason the probable crushing efficiency for this test was taken from the curve, instead of from the actual crushing diagram.

MINING EXAMINATIONS.

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YEAR WITH THE CONSOLIDATED MINES SELECTION.

Improved Value of the Company's Assets—The Brakpan Mine and Coal Trust.

At the sixteenth ordinary general meeting of the Consolidated Mines Selection Company, Limited, held recently in London, Mr. Francis Muir (chairman of the company) presided.

The Chairman said :—I assume it is your pleasure that we take the report and accounts now submitted for your approval as read. They are unusually full and complete, including, as they do for the first time, the reports and accounts of our subsidiary companies—Brakpan Mines, Springs Mines, and Transvaal Coal Trust. You may also have noticed in the papers the reports of these companies' meetings in Johannesburg, on Tuesday last, so that, altogether, you have before you the fullest information as to the position and prospects of our company, making it unnecessary for me to detain you by any lengthened observations. The accounts, which are exceedingly plain and simple, cover a period of just about five months, viz., from the date at which the reduction of capital was sanctioned by the court to December 31 last. On the whole the period was one of quietness and afforded small scope for profitable business, and the improvement in the position of the company, to which I shall presently refer, must be chiefly put down to the distinct advance in the value of some of your principal holdings—that is, Brakpan and Springs Mines and the Transvaal Coal Trust. Of course, we have been looking forward to this for several years, and if there have been some delays and disappointments the present emergence into better times is all the more welcome. The profits actually realised for the five months, after payment of expenses and debenture interest and writing down certain securities, amounted to £11,596 18s. 10d., which we propose to carry forward to next account. In accordance with the policy foreshadowed at the time the capital was reduced, we have purchased debentures since December 31, as offered, to the amount of £21,080, and there now remains outstanding £117,320. In addition to these figures a careful valuation of our assets on December 31 showed an increment of £90,263 as compared with August 2, and to-day there is a further improvement since January 1 of about £186,000. On the whole, therefore, our present position is better than it was on August 2 by about £287,000. From the telegraphed reports of the annual meetings of the above-mentioned three companies held in Johannesburg during the past week, you may have noticed the confident expectations of the chairman as to the dividend prospects of Brakpan and Coal Trust. These forecasts entirely confirm the expectations we have formed for some time past, and we fully anticipate that this fulfilment will, before long, put us in a position to again distribute profits among our own shareholders. We are frequently asked to state what our interest is in the various properties, or to publish a list of our assets, but have hitherto declined to do so, in what seemed to us to be the best interest of the company. We are still of the same opinion, but see no harm in stating that our holdings in Brakpan and Coal Trust amount to-day to a sum fully equal to our capital, while the debenture debt is much more than covered by the cash in hand. In addition to this there are other very valuable holdings, such as Springs Mines, Booysens, Deep Level shares, and Itabira Iron. You will doubtless remember that one argument in faveur of the reduction of capital was that no shareholder would be one penny the worse for the operation, but that his interest in the concern would remain absolutely intact, and I think the position to-day fully justifies that point of view, with this additional advantage, that we shall be in a position to pay dividends as earned, instead of having to wait until the whole amount of lost capital had been replaced out of profits. That is practically all I have to say, but I think it is opportune that I should give you the latest news from the Brakpan Mine, which came in this morning. The cablegram says : " The stamps working for the month of April were 115; running time, 29 days; ore crushed, 48,173 tons; tube mills working, six; ore hoisted, 54,625 tons; ore from dump, 1,320 tons; waste sorted, 15.32 per cent.; fine gold declared, 17,443 oz.; value declared, £73,314, equal to 30s. 5d. per ton milled; working costs, £42,365, equal to 17s. 7d. per ton milled; working profit, £30,949, equal to 12s. 10d. per ton milled. In addition to the above, the value of the gold reserve of 3,800 oz. has been declared at £15,973." From the last quarterly statement, which has just be issued, the linear development work for the quarter ended March 31 amounted to 1,916½ft., of which 1,563ft. were on reef averaging 8.7 dwt. over a reef width of 42.7 inches. These returns are extremely gratifying, and perhaps, while I am on that subject, I might just say what we have heard as to the manner in which Brakpan has been developed—the work of the engineers, managers, and everybody connected with it. The thing has gone with remarkable smoothness, and the results that we are getting are rather better than have been forecast to us all along. We feel, and I think our shareholders will feel, that we have every reason to be gratified with the position of our company and its interest in the Brakpan Mine. (Hear, hear.) I beg to move : " That the directors' report for the period ended December 31, 1911, together with the accounts annexed thereto, be, and the same are hereby, approved and adopted."

Mr. Walter McDermott seconded the motion.

The Chairman intimated that he would be pleased to hear any remarks which shareholders desired to make, or to answer any questions which might be asked.

Mr. Mervyn King said it seemed that the company had now been steered into pleasant waters. It had gone through troublous times, but its affairs had been very ably conducted by the directors. The board did not mention in their report whether the company was still interested in a diamond mine, and he desired to know whether this was so, and also when the Brakpan Mine would have all their stamps at work. It was very pleasant to hear the statement which the chairman had made, and he thought they might say that they had now passed through the worst of their troubles. He hoped that future meetings would be of as pleasant a character as the present one, and that next time they met they would have returned to the dividend stage. (Hear, hear.)

Mr. Hentschel asked how many shares the company held in the Brakpan Mines. (Laughter.)

The Chairman : That question has the virtue of directness, at all events. Perhaps you noticed that in my remarks I said we did hold, but that our holdings in Brakpan and the Transvaal Coal Trust amount to-day to a sum equal to our capital; that is to say, we have a capital of £552,000, and we have that much in Brakpan and Transvaal Coal Trust.

Mr. Mervyn King : You did not mention the West African Syndicate, I think?

The Chairman : You will find that in the report.

Mr. Mervyn King : Is there any chance there in the future?

The Chairman : We cannot tell; but we always live in hope. With regard to Mr. Mervyn King's other question as to diamonds, we still have an interest, but nothing very big. With regard to Brakpan, the latest returns as to labour are very good, and it is on that question of labour that the getting of all the stamps to work hinges. There are now 115 stamps at work out of a total of 160, and they hope gradually to get them all in operation. Much of the labour they are getting is rather raw, and will take some time to train; but I suppose I would not be overstating the case if I were to say that by the end of this year, or, perhaps, sooner, they will have the whole 160 stamps at work, and, of course, the production will be proportionately increased.

Mr. G. H. Brewer asked whether it was necessary to have two managing directors in London, seeing that all the company's interests were in the Transvaal, where they also had a managing director.

The Chairman, in reply, said that, so far, they had found that two managing directors in London were not too many for the work to be done, and they had very large interests elsewhere besides those in the Transvaal. It had never occurred to the Board that they might dispense with the services of one of their managing directors; but if at any time they found they could do so they would not hesitate to apply the knife. He saw no prospect, however, of their doing so at present.

The motion was carried unanimously, and, on the proposition of Mr. B. Kitzinger, seconded by Dr. R. Goering, the retiring directors (Messrs. Francis Muir, Maxmilian Kempner, and Carl Parcus) were re-elected.

Mr. A. S. Elmore proposed the re-appointment of Messrs. Deloitte, Plender, Griffiths and Co. as auditors, which was seconded by Mr. A. Mounsey and carried.

Mr. Mervyn King moved a vote of thanks to the chairman for his able conduct of the meeting, and expressed the hope that when they met a year hence the expectations they had all entertained would have been realised. He looked forward to a great future for the company. He thought they were all proud of their chairman, and of the way in which he had steered the ship through the shoals. He trusted they would soon reach the haven they all so much desired.

The vote was unanimously accorded, and the Chairman, in acknowledging the compliment, said they did not brag much on that Board; in fact, he saw that one paper had stated that morning that they were very modest and retiring, and did not have a great deal to say about what they were going or hoped to do. He could say honestly, however, that they did the very best they could in the interest of the company, and that they worked very conscientiously and faithfully. They spent a great deal of time over the work, and were therefore all the more gratified that they had now, as they hoped, emerged into smooth waters and better times. (Hear, hear.) They certainly hoped and expected that these good times would continue.

The proceedings then terminated.

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APRIL GRADE, COSTS, AND PROFITS.

Analysis of the Gold Production for the Month.

The usual monthly analysis of the gold production for April issued by the Chamber of Mines is presented hereunder :—

THE WITWATERSRAND

	Total value recovered.	Value recovered per ton milled.	Total working cost per ton milled.	Total working costs.	Working profit.	Working profit per ton milled.
	£	s. d.	s. d.	£	£	s. d.
1. Aurora West United ...	14,761	23 3	20 5	13,017	1,700	2 8
2. Bantjes Consolidated ...	34,445	30 2	24 6	27,751	6,174	5 5
3. Benoni Consolidated ...	18,571	21 1	19 11	17,542	776	0 11
4. Brakpan Mines	74,098	30 6	17 7	42,365	46,922	12 10
5. Cinderella Consolidated	27,525	30 7	24 1	21,718	6,007	6 8
6. City Deep	69,200	34 11	23 4	45,540	21,608	11 1
7. City and Suburban ...	50,497	38 5	22 10	29,206	20,372	16 0
8. Cons. Langlaagte	29,071	24 7	20 7	20,637	8,436	8 5
9. Cons. Main Reef	30,040	27 4	20 1	22,030	8,644	7 10
10. Crown Mines	247,405	33 1	19 3	143,725	100,468	13 5
11. Durban Roodepoort ...	14,752	21 11	15 8	10,592	4,160	6 2
12. Durban Rood. Deep ...	37,673	31 0	23 11	29,079	8,049	6 8
13. East Rand Propy. ...	267,743	32 11	21 1	165,918	98,596	12 6
14. Ferreira	27,113	27 11	18 11	17,201	7,834	8 7
15. Ferreira Deep	78,451	48 7	22 10	36,922	40,612	25 2
16. Geduld Proprietary ...	18,486	26 4	20 5	14,339	4,104	5 10
17. Geldenhuis Deep	86,144	30 11	24 4	67,470	17,558	6 4
18. Ginsberg	20,559	30 4	21 2	14,327	6,404	9 6
19. Glencairn Main Reef ...	15,644	15 4	14 0	12,973	2,670	2 10
20. Jumpers-cum-Treasury .	16,999	41 3	34 8	13,712	1,543	3 11
21. Jupiter	40,103	20 4	17 4	34,222	5,871	3 0
22. Knight Central	29,904	25 0	19 7	23,451	6,048	5 0
23. Knights Deep	52,336	17 6	11 6	34,339	17,380	5 10
24. Lancaster West	20,266	22 10	25 8	22,238	*2,021	*2 4
25. Langlaagte Estate ...	60,131	21 0	—	—	13,400	5 2
26. Luipaardsvlei Estate ...	15,865	18 1	17 2	14,084	647	0 9
27. Main Reef West	26,506	34 2	22 6	17,427	8,779	11 4
28. May Consolidated ...	16,320	26 9	16 11	10,138	6,070	10 1
29. Meyer and Charlton ...	33,859	49 1	17 7	12,114	17,488	25 4
30. Midas Deep	616	9 2	—	—	—	—
31. Modderfontein B. ...	60,734	39 4	18 2	28,122	31,909	20 8
32. New Goch	25,847	20 10	18 5	22,852	2,951	2 5
33. New Heriot	22,109	36 3	23 2	13,455	8,371	14 5
34 New Kleinfontein ...	54,745	28 2	19 6	37,974	16,012	8 3
35. New Modderfontein ...	87,465	39 10	21 8	47,234	39,148	17 11
36 New Primrose	33,655	26 10	14 4	17,074	16,581	13 11
37. New Riotfontein	20,155	26 5	21 8	16,578	3,579	4 8
38. New Unified	16,625	31 7	22 7	11,647	4,978	9 8
39. Nourse Mines	83,850	32 4	22 7	58,101	24,678	9 7
40. Princess Estate	21,799	24 6	25 4	22,583	*835	*0 11
41. Randfontein Central ...	241,509	23 8	—	—	68,000	5 10
42. Robinson	97,864	43 11	16 3	36,229	60,491	27 1
43. Robinson Deep	80,660	32 4	17 3	43,112	37,306	14 11
44 Roodepoort United ...	29,216	21 9	19 0	25,585	4,647	3 6
45. Rose Deep	90,893	29 1	18 2	56.793	33,032	10 7
46. Simmer and Jack ...	81,161	21 11	11 5	42,325	39,597	10 8
48. Simmer East	29,394	18 6	14 10	23.559	5,453	3 5
49. Simmer Deep	39,155	17 9	17 8	38,871	1,156	0 6
49. Spes Bona Tribute ...	5,692	20 1	—	—	—	—
60. Van Ryn	50,200	26 0	14 10	28.800	22,513	11 7
51. Village Deep	70,886	28 10	19 2	47,069	22,969	9 4
52. Village Main Reef ...	70,321	36 5	18 11	35,830	32,359	17 0
53. Vogelstruis Estate ...	12,382	21 9	21 11	11,359	1,009	1 11
54. West Rand Central ...	3,874	27 1	27 6	3,778	96	0 8
55. West Rand Cons.... ...	36,305	26 5	22 8	31,128	5,188	3 9
56. Witwatersrand	45,332	23 6	14 10	28,503	16,831	8 9
57. Wit. Deep	53,007	28 5	19 4	35,414	16,519	9 0
68. Wolhuter	40,167	27 7	17 6	25,418	15,083	10 5
Miscellaneous producers	22,055	—	—	—	—	—
Witwatersrand totals	3,002,140	28 6	19 0	—	†1,005,920	9 8
			56 cos.		56 cos.	56 cos.

*Loss.

†Includes £15,973, value of gold reserves extinguished included in total working profit, but not in working profit per ton milled.

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

	Total value recovered.	Value recovered per ton milled.	Total working cost per ton milled.	Total working costs.	Working profit.	Working profit per ton milled.
	£	s. d.	s. d.	£	£	s. d.
HEIDELBERG—						
1. Nigel	19,977	30 6	24 7	15.705	4,049	6 4
2. Sub Nigel	9.345	44 3	34 9	7,347	1.023	4 10
BARBERTON—						
3. Barrott	820	5 9	—	—	—	—
4. Sheba	12,624	47 2	31 7	8,459	4,162	15 7
5. Sheba (Rosetta)	1,712	20 6	—	—	—	—
6. Worcester	5,773	22 0	—	—	—	—
LYDENBURG—						
7. Glynn's Lydenburg ...	7,247	48 3	24 9	3,727	3,593	23 11
8. Transvaal G.M. Estates	41,369	68 1	28 11	17,589	23,329	38 5
Miscellaneous producers	32,376	—	—	—	—	—
Total (outside districts)	131,243	41 11	28 2	—	36,156	19 3
			5 cos.		5 cos.	5 cos.
Grand totals	3,133,383	28 10	19 2	—	1,042,076	9 10
			61 cos.		61 cos.	61 cos.

The working profits declared for the Transvaal since the commencement of 1909 are:

	1909 £	1910. £	Inc. £	Dec. £
January	1,047,395	952,001		95,394
February	944,262	900,269		43,993
March	994,038	939,127		54,911
April...	1,019,288	955,240		64,048
May	1,038,292	990,607		47,685
June...	1,039,519	955,170		74,349
July	1,027,374	972,563		44,811
August	1,010,765	991,707		19,058
September	992,748	974,362		18,386
October	980,586	981,991	1,405	
November	995,971	977,120		18,851
December...	984,064	976,942		7,122
Totals	12,074,302	11,567,099		

	1910. £	1911. £	Inc. £	Dec. £
January	952,001	954,536	2,535	
February	900,269	898,738		1,538
March	939,127	973,470	33,343	
April	955,240	1,000,043	44,803	
May	990,607	981,788		8,819
June	955,170	987,557	32,387	
July	972,563	998,340	25,877	
August...	991,707	996,072	4,365	
September	974,362	979,328	5,006	
October	981,991	974,236		7,765
November	977,120	990,617	13,497	
December	976,942	991,145	14,203	
Totals	£11,567,099	11,725,897		

	1911. £	1912. £	Inc. £	Dec. £
January	954,536	1,021,073	66,537	
February	898,738	930,739	32,001	
March	973,470	1,245,321	271,851	
April	1,000,043	1,042,076	42,033	

The dividends declared during the four months were :—

	1912.		1911.
January	£82,782	....	£124,782
February	12,500	....	23,699
March	18,200	....	295,384
April	75,250	————	64,500

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Rhodesian Section.

LATEST FROM THE MINES.

Diamond Monopoly—A Gold Fields' Option Exercised—New Companies—Ancient Gold Mines—Labour Bureau Position.

Rhodesians are grateful to Mr. Geo. Mitchell for his spirited attack on the De Beers monopoly over the diamonds of Rhodesia, and his bold endeavour to compel them to take active steps to do some work under their licence. The reply of De Beers, "that it is not in the company's interest at present, nor in the interest of the diamond market to encourage the prospecting for diamonds" is only what might have been expected. There is no question that there are diamond pipes in Rhodesia outside the Bembesi area—now being opened up under special arrangement with De Beers by the South African Options Syndicate, and, Mr. Mitchell says, De Beers must be forced, if necessary, by special legislation to do some work under that licence. What applied to gold mining claims should apply to diamonds. They must work their ground or quit. The Secretary of Mines appears to be of opinion that De Beers cannot be forced in the manner suggested, as their licence specifies no particular date by which they must get to work, but he holds out the hope that there is a possibility of some arrangement being come to whereby diamond pipes may be looked for and worked.

* * * *

The Rhodesian Treasurer's Budget statement, presented to the Legislative Council last week-end, showed a surplus brought forward from last year of £26,972. This year's revenue (including the amount brought forward) is estimated at £827,000, and the expenditure at £894,714; in other words the Treasurer calculates on a deficit for the current year of £40,742. The statement has provoked a good deal of criticism from the elected members, and Mr. Geo. Mitchell, in particular, has advised that a loan should be raised out of which purely "capital" expenditure shall be met, or, failing that, that expenditure shall be kept strictly within revenue limits. The high cost of living in the territory, it may be noted, was declared by the various speakers as being most largely attributable to excessive railway rates.

* * * *

The Gold Fields Rhodesian Development Company have concluded the terms of their option over the Umsweswe properties of Messrs. Moser Bros. The option is for a period of twelve months, during which the company will conduct extensive prospecting and development operations. Mr. B. E. Hicks is in charge of these. The claims are said to embrace an extensive auriferous schist body.

* * * *

The following particulars were taken from the quarterly report of the Jumbo G.M. Company for the period ended March 31: Driven, sunk and risen, 421 ft.; ore developed at January 1, 17,286 tons; average value, 9·78 dwts; excess tonnage in stopes and development rock taken in, 4,650; total, 21,936 tons; ore crushed, January 1 to March 31, 9,490 tons; ore reserves at March 31, 12,446 tons; average value, 9·6 dwts.; yield from mill and re-treatment, 3,501 ozs.; yield per ton treated, 7·377 dwts.; cost per ton crushed, £1 8s. 5·814d.; profit, £706, equal to 1s. 5·843d. per ton; capital expenditure, £2,056.

* * * *

The number of joint-stock companies registered in Southern Rhodesia during the year 1911 totalled twenty-seven, and these had a combined capital of £1,350,500. Most of these had reference to mining ventures in the country, but a notable exception was the Rhodesia Land Bank, Ltd., registered just before the close of the year, with a capital of £250,000.

The May number of the *South African Journal for the Advancement of Science* contains an interesting article by Mr. R. N. Hall, F.R.G.S., dealing with the present position of the discussion as to the origin of the Zimbabwe-culture. Mr. Hall asserts that the building of the Zimbabwe and other ancient structures, also the vast amount of gold mining, as disclosed by ancient workings, was not the work of Bantu races but of people from the East, and that the South Arabians, Persians and Indians were in all probability the authors. All the evidence points in this direction, from the methods used in mining to the ornaments of the temples. Mr. Hall says this view is now generally held by all scientific men who have given the matter deep study. He suggests that Dr. McIver's hypothesis that it was of Bantu origin will not bear examination in the light of all the facts, and that this was a theory he (Mr. Hall) himself held for many years until he was forced to a different conclusion by the actual evidence brought to light by spade work in the different ruins. Mr. Hall asks that the Beit or Rhodes' trustees should follow up Mr. Rhodes' train of thought, and send scholars to investigate the little known Arabian, Persian and Indian ancient records which, he believes, would throw a flood of light upon the early history of the great gold fields of what is now Rhodesia, from whose "ancient workings," on the estimates of expert mining engineers, something like 200 millions of pounds worth of gold were extracted in prehistoric times.

* * * *

During the first four months of the existence of the new Rhodesian Native Labour Bureau only 12,649 out of the 250,000 shares have been applied for, or, roughly, five per cent., and this at 2s. 6d. per share amounts to £1,606 2s. 6d. The amount so far received in respect of the Labour Tax is £2,500 in respect of the January tax (received in March) and £3,000 in respect of February tax (received in April). No deduction was made by the Government for the cost of the collection of the tax, the whole amount being handed to the Bureau. During the period in question the number of labourers supplied by the Bureau has been 3,314, of which 1,908 went to mining members, 1,045 to farming members and 361 to general members, and none to non-members. The reason why the first general meeting has not been held is because it was felt desirable to defer it for many reasons, but principally owing to the fact that would-be shareholders had to be allowed time to join the Bureau and to receive their scrip before the meeting takes place. It has, very properly, been pointed out that the bulk of the Labour Tax so far collected doubtless came from the 1s. tax contributed as pass office fees by residents in the towns, but, so far, they have not received a single labourer. Furthermore, the Government has handed over the gross amount of the tax to the Bureau, leaving the cost of the collection to fall upon the country. As by far the largest proportion of the taxation falls upon the townspeople, it will be seen that they are called upon to pay both directly and indirectly but get no direct benefit in return. They are not grumbling—yet! But they propose to take a hand in the game before very long, and then, perhaps, both mines and farms will realise that the poor, long-suffering, overburdened townsman, upon whose shoulders the costs of living press with peculiar force, will turn in his wrath and tell both the wrangling parties to pay for their own labour out of their own pockets!

* * * *

In connection with the recruiting of labour we notice that the Bureau in a circular letter to the employees of the Bureau states: "It is hoped by doubling the number of agents in the North and employing touts without uniforms, but with badges only, to keep the existence of the Bureau and the opportunity for going to work constantly before the natives and in this manner to attract the increased number which will render the commission remunerative to those interested in recruiting." It certainly will be very necessary for the Bureau to hustle itself with regard to the North if it desires to get plenty of labour for the South and placate the Northern settlers at the same time. There was a big meeting of North-West farmers from all parts of North-Western Rhodesia at Kafue last week, when, on the reading of a letter from the North-Eastern Farmers' Association, it was resolved to call the attention of the Administrator to the fact that the demands of the farmers in the Northern territories for labour had not been in any way adequately met by the Rhodesian Native Labour Bureau, and that unless the Bureau is in a positon on the 1st August next to give satisfactory assurances to His Honour that they will be able to supply not less than 75 per cent. of the labour applied for, His Honour be requested to cancel the recruiting rights of the Bureau in certain districts, and issue recruiting licences to members of the Association. It was further agreed that if the Bureau is unable to supply the percentage mentioned steps be taken to terminate the operations of the Bureau in the Northern territories and to set up a fresh organisation there. Strong protests were raised against exploiting the labour supply of Northern Rhodesia for the benefit of Southern Rhodesia.

OUTPUT PROSPECTS IN RHODESIA.

The Promise of New Mines—An Interesting Survey.

It is unlikely that any very noteworthy advance will be recorded in the gold output of Southern Rhodesia for the current year, but there are sound reasons for believing that towards the end of next year progressive and substantial advances in production will be registered. For the first four months of 1911 the gold output of the country has amounted in value to 204,499 ozs., or an average of 51,125 ozs. per month. The output for the twelve months of 1911 was 628,521 ozs., or an average of 52,377 ozs. per month, the return for the first four months being 205,185 ozs. It will be seen from these figures that there has been little change in so far as the actual productive status of the industry is concerned.

But, as has been frequently pointed out, development work is being pushed on with, particularly in Mashonaland, and in another twelve or fifteen months' time the harvest of this development should begin to be reaped. For the moment the Shamva, at Abercorn, is not being exploited so rapidly as hitherto on account of an accident to the compressor plant. But this is being adjusted, and before the close of 1912 the Shamva should have between three and four million tons of low-grade but profitable ore exposed. Already a start has been made in erecting plant, and as the Salisbury-Mazoe-Abercorn branch railway is being hastened on to the mine, equipment will be delivered without any undue hindrances. Judging from the development reports issued by the parental concern, the Gold Fields Rhodesian Development Company, it looks as if the recovery would be in the neighbourhood of sixteen shillings per ton. Eventually the Shamva will possess by far and away the largest milling equipment in Rhodesia. Having regard to the tonnage already blocked out, the great width of the ore bodies and the strong presumptive evidence as to the enormity of the auriferous formation, 300 stamps with tube mills does not seem by any means a too ponderous reduction plant, but for a start a much smaller installation naturally will be utilised.

The other large property which may be expected to contribute a material quota to the gold output of Southern Rhodesia in the very near future is the Cam and Motor on the Eiffel Flats. This property cannot be expected to develop into such a huge concern as the Shamva (which promises to become a South African Homestake), but the ore bodies are very large and the "grade" so far disclosed is much higher than at the Abercorn mine. The ore developed to date at an unofficial estimate is in the neighbourhood of a million tons, and is expected to yield about forty shillings per ton. Here, too, preparations are well advanced for the erection of a reduction and treatment equipment of moderate capacity which will be supplemented as the state of the mine warrants. Both at the Shamva and the Cam and Motor the ores have been thoroughly tested at experimental plants before plans and specifications for the permanent installations have been passed, and no metallurgical difficulties of consequence are anticipated. It looks as though these two concerns would be producing between them several thousand ounces per month towards the end of next year, and such production will be steadily augmented.

Four other sources of increased output in the shape of new producers present themselves in the Eileen Alannah, the Golden Kopje, the Falcon and the Antelope. The Eileen Alannah, on the Eiffel Flats, owned by the Willoughby's Consolidated Company, is in an advanced state of development, and is already equipped with a small plant. A larger installation is to be erected. The Golden Kopje, recently floated under Gold Fields Rhodesian Development auspices, gives promise of largely increasing the Lomagundi district output. For years the Falcon, which is in reality one of the largest and most promising concerns in Matabeleland, has been allowed to lie dormant, but an active policy has now been sanctioned and the erection of a reduction and treatment plant (which will doubtless include a concentration plant) is being proceeded with. The ore contains about 6 dwts. of gold per ton, and a not immaterial percentage of copper. The Antelope, situated to the south-west of Bulawayo, is one of the mines formerly controlled by the Rhodesian Exploration and Development Company and now embraced by the Gold Fields Rhodesian Development Company. A fairly large tonnage of ore has been developed, and the property may be reckoned on to enter the productive list at an early date.

The six mines referred to will certainly add greatly to Rhodesia's production when they commence milling, for in each instance sound business-like counsels have prevailed and the accusation of premature crushing cannot be alleged against any of them.

As to the existing producers, the prospect for maintenance of the present rate of output is hopeful. The usual see-saw variations will continue—one mine will secure bad results and another will vastly improve its returns. This has ever been the history of gold mining in Charterland and presumably it ever will be. At the present moment some of the older and more established mines of the country are securing most disappointing returns, whilst others are exceeding all their previous records. Taken on the whole, there is every reason to anticipate neither a marked falling-off nor an appreciable advance until the mines referred to above signalise their advent to the distinction of productivity by dropping stamps. In well-informed circles it is expected that a very noticeable upward tendency in the Southern Rhodesian output will be observable in about fifteen months' time.

Mr. Jeffreys is reported to be making good progress with the development work on the Toronto. The main adit is now in 145 ft., nearly 100 ft. of this having been done in a month with two working shifts. Another adit on the property is in 105 ft., this is also being pushed on and is worked by two shifts. Some shaft sinking is also being started on the Winchester claims.

RHODESIAN MINERAL OUTPUT FOR APRIL.

Increased Gold Return—Full Details.

We have received from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of April, 1912, with comparisons and values:—

GOLD.

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
Bulawayo District—				
Agincourt (Est. S. Roodt, deceased) ...	5	651	513.32	2156
Alice (R. Barkley)	10	1327	269.30	1131
Aln (W. H. Robinson)	2	124	46.40	195
Do. (tailings)	—	101	16.57	70
Antenior (E. Granger and Co.)	2	183	55.03	231
Bengali (Hicks and Arberry)	5	356	137.23	576
Do. (tailings)	—	260	19.44	82
Berwick (Rhodesia, Ltd.)	(6)	362	563.54	2367
Big Ben (W. E. Hunt)	4	184	168.29	707
Blanket (Forbes Rhod. Synd.)	10	300	36.96	150
Bucks Reef G.M., Ltd.	5	914	408.80	1716
Do. (tailings)	—	638	120.65	507
Bushtick Mines, Ltd.	20 1C 2T	4052	44.49	187
Do. (tailings)	—	1756	565.09	2373
Do. (slimes)	—	688	81.62	343
"C" (D. & C. Syndicate)	10	1010	85.68	360
Do. (tailings)	—	724	94.85	398
Do. (slimes)	—	286	92.83	390
Champion, 1S.E. (R. Aserman)	5	110	77.86	327
Do. (tailings)	—	115	38.41	161
Claremont Mines (Rhod.), Ltd.	20	2376	1212.37	5092
Clean Up (Belingwe G.M. Synd.) (clean up)	—	—	69.03	290
Cumberland (H. W. Bearcroft)	5	110	15.50	65
Eagle A (Peard & McDonald & Co.)	5	440	156.95	659
Do. (tailings)	—	255	34.22	144
Ella's (D. Vincent)	4	130	31.74	133
Farvic (Rhodesia, Ltd.)	6 1P	265	104.40	438
Do. (tailings)	—	286	50.54	212
Do. (slimes)	—	110	40.24	169
Glen (A. Fraser)	3	330	97.37	409
Glenmark (A. D. Hall)	5	321	96.52	405
Do. (tailings)	—	350	29.41	124
Intabanenda 2 S (Estate of B. Smallie, deceased)	5	196	28.34	119
Do. (tailings)	—	147	10.01	42
Kalydon (Rose Mine Synd.)...	5	280	195.40	821
Lemon (Anderson and Moyes)...	2	152	35.54	149
Lonely Reef G.M. Co., Ltd.	15 1T	2628	371.06	1559
Do. (slimes)	—	3910	2763.55	11667
N'Daba (M. Westerberg)	2	24	14.88	62
Nelly (F. D. Roscoe)	2H	385	83.57	351
Do. (clean-up tailings)...	—	10	15.87	67
New Eclipse (J. R. Stewart)	2	265	131.04	550
Do. (tailings)	—	300	26.21	110
Newery pannings (E. V. Campbell) ...	—	—	1.53	6
New Robin A (E. T. Clayton)	2	50	18.24	77
Northern Star and Kimono (Peel's R. Synd., Led.)	10	720	287.27	1206
Old Camp (Coleman & Barrett) clean-up	—	—	8.21	34
Old Nic (Chart. & Gen. E. & F.Co.. Ltd.)	15 4P	1667	714.91	3003
Do. (tailings)	—	969	36.36	153
Peach (C. Salomon)	5	30	116.44	489
Penzance (R. Urquhart)	2	80	15.83	66
Do. (tailings)	—	80	18.58	78
Queen's (Matabele Queen's Co., Ltd.)	10	1402	342.88	1440
Do. (tailings)	—	657	212.23	891
Do. (slimes)	—	—	167.36	703
Queen's W. (Cummings & Berry)... ...	3	253	147.14	618
Do. (tailings)	—	459	144.58	607
Ringstead (Fripp & Ballard) (clean-up)	—	—	9.23	39
Riversdale (Bruhns & Schwarz)	4	150	58.76	247
Romola Nigel G.M. Co., Ltd.	5	527	227.34	955
Do. (tailings)	—	385	45.39	191
Smiley D.B. (F. E. Davis)	5	320	98.29	413
St. Patrick (J. Falk)	2	52	12.13	51
Suffolk (undeclared. March)	5	65	54.10	227
Do. (H. D. Bishopp) (April) ...	5	272	84.56	355
Susanna Mines, Ltd.	8	749	464.61	1951
Do. (tailings)	—	430	67.75	285
Do. (slimes)	—	732	102.07	429
Tuff Nut (King's Synd.)	5	670	546.44	2295
Do. (tailings)	—	420	80.94	340
Bulawayo District Total			13,133.29	55,158
Gwelo District—				
Arizona No. 2 (tailings) A. J. Marchant) (tailings)	—	450	42.09	177
Arizona, No. 2 S. (Williams & Woodger)	2	165	125.80	528
Do. (tailings)	—	195	25.11	106
Arm (H. S. Henderson)	5	50	19.50	82
Beppo (J. Maleham)	6	307	87.18	366
Black Cat (Mrs. V. E. Pott) (pannings	—	—	11.21	47
Broad Arrow (Broad Arrow Synd.) ...	5	349	59.74	251
Do. (tailings)	—	209	10.57	44
Bute (T. Pedlow)	5	41	21.82	92
Csardas (Wolfshall Syndicate)...	10	536	406.49	1707
Do. (tailings)	—	422	80.51	339
Gaika G.M. Co., Ltd.	5 1C	2984	1123.15	4717
Do. (tailings)	—	1580	117.92	495
Gartley (Mrs. A. J. Grant)	2	25	10.33	43
Globe and Phoenix G.M. Co., Ltd. .	40 10P	5143	7146.66	30016
Do. (not previously declared) ...	—	—	1375.29	5776
Do. (concentrates)	—	295	493.49	2073
Do. (slimes)	—	2930	470.04	1974
Guinea Fowl (Sadler & Holloway) ...	5	360	42.22	177
Do. (tailings)	—	250	25.31	106
Invulnerabie (A. E. West)	5	274	65.07	273
New Dunraven G.M. Ltd.	5	693	173.52	729
Do. (tailings)...	—	510	20.65	87
N'Kanya (Tranmer G. Syn., Ltd.) (Mrs. R. O. Dollar)	2	36	26.38	111
North Bonsor (Cornish Syndicate) ...	15	1737	325.93	1369
Do. (tailings)	—	1050	91.13	383
Pompei (Pharos Synd.)	2	90	44.87	188
Pretty Polly (New Rhod. R. Co., Ltd.)	5	470	209.86	882
Do. (tailings)	—	280	92.93	390
Prince George (J. H. Veasey) (slimes)	—	425	52.50	220
Selukwe Columbia G.M., Ltd.	1C 3P	1901	507.82	2133
Do. (concentrates)	—	71	112.15	471
Do. (tailings)	—	1303	204.42	859
Do. (slimes)	—	590	75.34	316
Sheba-Bongola (Forbes R. Synd.)	5	194	37.48	157
Do. (tailings)	—	143	146.56	616
South Bonsor (Ideal Synd.)	10	684	36.27	152
Wanderer (Selukwe) G. M., Ltd.. ...	4GR	16600	1758.20	7468
Do. (slags)	—	—	5.30	23
Wild Dog (tailings) (Gilday & O'Connor)	—	350	46.44	195
Gwelo District Total			15,727.28	66.138
Matabeleland Total			28,860.57 ozs.	
Value			£121,296.	

MASHONALAND.

	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
Salisbury District—				
Abercorn (J. Seton Rogers) tailings ...	—	250	20.17	85
Gladstone A (L. Chiappini) (tailings)	—	700	30.80	129
Mont d'Or (Claxton and Bussell).. ...	2	180	92.40	388
Old Loyalty (Shamva Ilex G.M. Co., Ltd.)	5	620	297.76	1250
Do. (tailings)	—	299	40.40	170
Radnor (Jones & Wyllie)	2	48	37.82	159
Right Bower (J. Seton Rogers)	2	21	2.36	10
Salisbury Total			521.71	2,191
Mazoe District—				
Goth B (Goth Synd.)	2	70	31.08	131
Hastie (Hastie-Mazoe G.M. Co.. Ltd.) (March and April)	5	912	45.10	189
Hay G.M. Co., Ltd.	1T	2215	703.72	2984
Honest (G. Brown)	3	103	29.41	123
Jumbo G.M. Co., Ltd.	30	2500	729.79	3101
Do. (tailings)	—	1600	361.62	1537
Do. (slimes)	—	900	155.96	663
Lion and Lion DB (Assd. Mines of Rhodesia, Ltd.)	—	552	70.45	296
Mickey (B. G. Byerley)	2	201	155.22	652
Pannings (J. Buchan)	—	—	0.61	3
(Do. (H. Hepker)	—	—	2.37	10
Pierrot (J. H. Hall)	2	240	37.74	158
Umkulu D.B. 1W (Llahsram Synd.)	2	81	75.27	316
Mazoe Total			2,398.34	10,163
Lomagundi District—				
Alluvial (A. Coleman)	—	—	28.95	122
Eldorado Banket G.M. Co., Ltd. ...	2C 30	6850	2976.05	12621
Do. (tailings)	—	6790	1238.32	5252
Gella (Hudson & Frost)	3	30	23.87	100
Linnett (A. L. R. Morkel)	2	119	86.02	361
Lomagundi Total			4,353.21	18,456

	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
HARTLEY DISTRICT—				
Amaroso (C. H. Wheildon)	5	208	60.13	252
Do. (tailings)	—	140	18.56	78
Battlefields (Minaar & McArthur). ...	2C	1317	360.71	1515
Do. (tailings)	—	1347	180.81	759
Blue Rock (Ellsmoor & Goodyer)	2	205	95.43	401
Do. (tailings)	—	208	72.47	301
Brilliant (Mabel's Luck Synd.)	5	320	228.93	962
Do. (tailings)	—	192	79.87	335
Buller (J. Gunn)	5	450	106.71	448
Do. (tailings)	—	400	92.99	391
Cam & Motor G.M. Co., Ltd. (tailings)	—	988	239.42	1017
Casina No. 2 (B. E. R. Synd.)	(5)	250	14.99	63
Cee-Cee and Thistle G.M. Co.	5	18	4.44	19
Concession and W. Extension (C. E. Simpson)	5 1C 2P	2416	617.31	2593
Croupier (Croupier Synd.) (Feb.).. ...	2	131	30.82	129
Do. (March)	—	—	14.63	61
Do. (April)	—	40	11.33	48
Dalny (Philip Wiggins, Ltd.) (slimes)	—	320	50.45	212
Dreadnought (W. E. Masters)	C	378	35.16	148
Eiffel Blue & E. Ext. (Willoughbys Con. Co., Ltd.)	10	1254	640.05	2688
Do. (tailings)	—	750	44.21	186
Fontaine (B. L. P. Synd.)	2	36	9.01	38
Giant Mines of Rhodesia, Ltd.	30 2T	11100	4201.82	17823
Glasgow (Glasgow Mines, Ltd.)	5	414	122.83	516
Glencairn No. 3 (Glenrosa Synd.). ...	4	400	383.82	1612
Do. (tailings)	—	590	53.67	225
Golden Valley (J. Mack)	5	522	155.11	651
Do. (tailings)	—	250	72.10	303
Great Tontine (Yellow Jacket Synd.)	2	215	68.50	288
I.X.L. (Heroine G.M. Co., Ltd.) ...	2	240	41.42	174
Jasper (J. Hardy)	H	300	54.03	227
Jessie Palmer (Crown Synd.)	2	105	51.67	230
Do. (tailings)	—	80	11.46	48
Kanyemba (Kanyemba Synd.)	5	430	558.97	2348
Do. (tailings)	—	200	67.06	281
Lapwing (J. Davidson)	2	307	125.67	528
Do. (tailings)	—	300	28.77	120
Lemberg (A. D. Bentley)	(5)	100	29.00	122
Masterpiece G.M. Co., Ltd.	5	700	352.31	1480
Do. (tailings)	—	125	50.76	213
Moliere (H. Moser)	5	660	161.89	680
New Topaz (tailings) (J. Hardy)... ...	—	700	69.41	292
Oleander G.M. Co., Ltd.	3	76	67.47	283
Do. (tailings)	—	76	12.80	54
Owl (A. Rolfe)	10	1351	487.95	2049
Do. (tailings)	—	920	172.67	725
Pickstone, 1E. (S. L. Synd.)	1	405	517.95	2175
Do. (tailings)	—	394	168.63	708
Pool (tailings) (F. J. Nalty) March ...	—	720	146.88	617
Pool and Pool A. (Pool Synd.)	5	200	60.41	253
Progressive E. (R. R. Aitkin) (tailings)	—	150	17.87	75
Rhodesia Main No. 6 (Rhod. Main Reef Synd.) March	2	100	11.91	50
Shepherds (Phoenician Synd.)...	7	640	328.15	1378
Do. (tailings)...	—	550	177.01	743
Sateen (H. O. Herald)	2	60	18 93	80
Tyne (Kimberley Tyne G.M. Co Ltd.)	C	1550	215.16	904
Do. (tailings)	—	250	4.08	17
Unknown (Brooks & Martin)...	2	47	18.77	79
Upsala (J. B. Macdonald, G. G. Sale, & S. B. Schwabe) (tailings)	—	191	24.20	102
Washington (I. J. Minaar)	5	340	416.67	1750
Do. (tailings)	—	300	32.04	135
Whistlecock, 1 W (T. McDowell)... ...	2	120	26.89	113
Do. (tailings)	—	100	25.25	106
Hartley District Total			12.623.12	53.291
UMTALI DISTRICT—				
Cairn Dhu 2W (Parseval Synd.)	5	721	28.21	118
Duiker E. Ext. (Umtali W. Synd.) ...	(10)	185	16.36	69
Do. (tailings)	—	93	2.70	11
Dunn's Grand 1E (Carrick & Leslie). (tailings)	—	139	3.96	17
Liverpool (R. G. Snodgrass)	5	850	91.94	386
Do. (tailings)	—	329	42.19	177
Maggie W. (W. A. Hoole)	1	86	44.94	189
Mecca (Umtali Waterfall Synd.)	10	496	139.70	593
Palmyra (J. de G. Birch)	3	369	39.46	166
Penhalonga Mines, Ltd.	50	6109	598.57	2540
Do. (Concentrates)	—	130	532.90	2211
Perthshire D.B. (Sussex Synd.)	5	625	57.20	239
Do. (tailings)	—	250	36.34	154
Rezende Mines, Ltd.	35	4109	1067.10	4528
Do. (concentrates)	—	34	126.31	536
Do. (tailings)	—	2690	258.87	1098
Rezende 1 W. A. (Imbeza Synd.) ...	10	3713	348.85	1480
Do. (Concentrates)	—	8	133.59	561
Umtali (Umtali Waterfall Synd.)... ...	(10)	598	156.75	658
Do. (tailings)	—	193	103.65	435
Umtali Total			3,829.59	16,166

MASHONALAND TOTAL	23,726.27 ozs.
VALUE	£100,180.
GRAND TOTAL	52,586.84 ozs.
VALUE	£221,476.

SUMMARY.

Gold.—	Ozs.	Value.
Matabeleland	28,860.57	£121,296
Mashonaland	23.726.27	£100,180
Silver	14.180.75 ozs.	£1,618
Lead	50.51 tons	725
Chrome Iron	6.188.00 tons	13,813
Coal	13.156.00 ,, (sales)	4,574

TOTAL VALUE APRIL OUTPUT £242,206

COMPARISONS.

	Ozs.	
Gold Output April, 1912	52.586.84	£221,476
Gold Output March, 1912	51.072.09	215,102
Increase	1,514.75	6,374
Gold Output, April, 1912	52,586.84	221,476
Gold Output, April, 1911	52.546.20	221,296
Increase	40.64	180

GRAND TOTAL OUTPUT.

GOLD.—		Ozs.
Output to December 31,	1906...	1,989,775.69
Do.	1907...	612,052.00
Do.	1908...	606,961.81
Do.	1909...	623,388.42
Do.	1910...	609,955.31
Do.	1911...	628,521.37
Do.	1912 (4 months)	204,498.40
Total to date		5,275,153.03
Value of Gold Output to date		£20,532,365
SILVER.—		
Output to December 31,	1907...	445,678.20
Do.	1908...	283,424.00
Do.	1909...	262,132.78
Do.	1910...	217,632.71
Do.	1911...	187,730.02
Do.	1912 (4 months)	65,575.05
Total to date		1,452,172.76
LEAD.—		Tons.
Total to date		6,168.44
COPPER.—		
Total to date		359.01
COAL.—		
Output to December 31,	1907...	422,615
Do.	1908...	164,114
Do.	1909...	170,893
Do.	1910...	180,068
Do.	1911...	212,529
D.	1912 (4 months)	66,777
Total to date		1,216,996

Note.—All the declarations are in fine gold.

CHROME IRON —		
Output to December 31,	1907	11,663.99
Do.	1908	13,357.53
Do.	1909	25,620.47
Do.	1910	44,002.00
Do.	1911	52.363.21
Do.	1912 (4 months)	20,815.20
Total to date		167,822.40
TUNGSTEN ORES.—		
Total to date		124.87
ANTIMONY.—		
Total to date		13.75
ASBESTOS.—		
Total to date		1,119.50
DIAMONDS.—		Carats.
Total to date		6,889.21
OTHER PRECIOUS STONES.—		
Total to date		90,069.50

C : Chilian Mill; T : Tube Mill; G.R. : Gates Roll; H : Huntington Mill; P : Pneumatic Stamps; D : Dolly.

THE MONTHLY TOTALS.

The following table shows the value of the monthly and annual gold outputs of Southern Rhodesia since January, 1910, together with the value of the annual outputs of other minerals :—

	1910.	1911.	1912.
January	£227,508	£207,901	£214,918
February	203,888	203,055	209,743
March	228,385	231,947	215,102
April	228,213	221,296	221,476
May	224,888	211,413	
June	214,709	215,346	
July	195,233	237,517	
August	191,423	243,712	
September	178,950	225,777	
October	231,229	218,862	
November	210,573	214,040	
December	199,500	217,026	
Total Gold...	£2,568,198	£2,647,,895	£861,239
Other minerals... ...	222,930	212,864	78,799
Total Value	£2,791,128	£2,890,759	£910,038

A REVIEW OF RHODESIAN MINING.—II.

Points from the Secretary's Annual Report—Some Important Figures.

THE annual report of the Secretary for Mines, just presented to the Legislative Council, contains the following—the first part of which appeared last week :—

The reef claims current at the end of 1911 showed a small increase of 1,406 claims on the figures for the previous year, and whilst the current gold claims fell in number, the registrations for base minerals increased. The current claims on 31st December, 1911, totalled 131,374, as against 129,968 in 1910. The classes of minerals for which they were registered are as follows :—Gold claims, 101,472; tin claims, 23,963; copper claims, 3,524; lead claims, 890; chrome ore claims, 375; asbestos claims, 350; iron claims, 240; aluminium claims, 260; mercury claims, 150; tungsten claims, 30; scheelite claims, 30; mica claims, 30; graphite claims, 30; nickel claims, 30. The gold claims show a decrease of 20,335 claims, as compared with those current at the end of 1910. This is not a disquieting feature and can easily be explained. At the time of rushes a large amount of ground is pegged around and in the vicinity of valuable discoveries. These peggings are to a large extent purely speculative, and, if sales cannot be effected, the majority of the ground goes to abandonment. The terms on which the ground is held under the mining law are so easy that speculation of such a nature is rather encouraged than otherwise. Thus at the time when rushes occurred at the Eldorado, Shamva, Enterprise Schists and elsewhere, large areas of ground were pegged as gold claims which it was extremely unlikely would ever be worked. In the current gold claims I anticipate a further reduction during the present year, and the weeding out process will be beneficial; but it seems to me that with more stringent working clauses in our Mining Law the inflation of the current claims and subsequent shrinkage would in a large measure be obviated. In base mineral locations current there was a marked increase in 1911, viz., 21,741 claims. The 1911 figures were 29,902, as compared with 8,161 of 1910. The increase was chiefly attributable to the discovery of cassiterite in the Enterprise, Abercorn, and Victoria districts, and in consequence 23,963 tin claims were registered. Development work declared for inspection purposes showed a gratifying increase, which bears testimony to the solid work which is the keynote at the present time. The graded footage declared in 1911 amounted to 349,470 feet, as against 281,290 feet in 1910 and 198,170 feet in 1909. The increase in 1911 as against 1910 was, therefore, 68,180 feet, and against 1909 of 160,300 feet. This progress may be considered very satisfactory, but it by no means represents the total footage completed in the country, as work carried out on claims discharged from the British South Africa Company's interest and from work cannot be used for inspection purposes, and in consequence is not declared. As most of the principal crushing mines in the country are so discharged, and as continuous development and stoping has occurred on them, it is fair to say that if this work had been declared the footage completed would certainly have been over half as much again as the amount above-mentioned. The position of inspection of claims by work and payment may be summarised as follows :—Gold claims, inspected by work, 77,618, inspected by payment, 16,690; base minerals, inspected by work, 6,640, inspected by payment, 1.510; total inspected by work, 84,258; total inspected by payment, 18,200. If the inspection by work instead of payment had been obtained on the 18,200 claims the graded footage required would have amounted to 58,830 feet. The great majority of the tin claims did not require first inspection until January, 1912, otherwise the inspection figures generally would have been larger. Special registrations show an increase of 445 claims, but now that more ground is held by companies and syndicates a further rise in special registrations may be anticipated. The small worker looks upon special registration as expensive and unnecessary. The companies consider it essential on important holdings, so as to prevent any future disputes. The figures at the end of 1911 were 4,654 claims specially registered, as against 4,199 at the close of 1910. Administrative receipts record a distinct decrease in comparison with the previous year, chiefly owing to a drop in transfer duty. In 1910 there was a good deal of activity in the purchase of small workers' properties by financial houses, and in consequence the duty paid on transfer assumed a larger figure than had ever been known before, viz., £37,598. In 1911 those properties were being developed, and purchase of others received a check owing to the higher figures which were demanded. The transfer duty fell to £16,868. The gross revenue collections were £50,991, as against £77,398 in 1910. Refunds of half claims, licences, etc., amounted to £3.830, leaving a net revenue of £47,161, as against a net revenue for 1910 of £73,112.

Mr. J. Dalton, late of the Acorn mine, has returned from a trip to the Old Country.

The stamps on the Red Willow mine are now at work, and the owners, Messrs. Goss and Spargo, are very sanguine of good results.

The annual dinner of the Royal Colonial Institute was held in London on Friday. A message of greeting was sent by the Fellows of the Institute at Bulawayo, and was acknowledged by the Chairman, Lord Grey.

Mr. Featherstonhaugh, manager of the Bell mine, has been appointed manager of the Eldorado mine, in succession to Mr. Cook. He proceeded to the Eldorado on Monday. Mr. Hippisley, the surveyor there, has been appointed to act as manager of the Bell mine.

Tin Discovered at Selukwe.

The *Bulawayo Chronicle's* Selukwe correspondent reports that tin in large quantities has been discovered on two farms about eight miles from the township.

Situations Wanted.

CHEMIST AND ASSAYER seeks Situation on Mine. Thoroughly experienced in analysis of tin, copper and other base metals. B.S.C. honours in chemistry.

Apply, " CHEMIST,"
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METALLURGIST with more than 20 years actual practical experience in the treatment of gold, silver, copper and lead ores will be open for engagement after June 10th. Speciality: Treatment of refractory gold ores. Best of local references.

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THE WEEK IN THE SHAREMARKET.

Improving—Corner House Stocks in Demand—Brakpans Better—Tins in Favour.

The market closed cheerfully for the holiday on Friday. The satisfactory statements made at the Corner House and Barnato meetings, no doubt, had a good effect. Labour troubles look less formidable. Brakpans, Modder B., City Deeps and the Far Eastern companies came in for most attention, and in tins there is a daily increasing degree of activity to be noted. Diamonds are quiet, though better bids were made for Premiers, Roberts Victor and Voorspoeds. Rooiberg Tins have quite come into favour again, and the new plant is said to be running excellently. Leeuwpoorts will soon make their bow, and should prove a popular counter. The Rex Zaaiplaats Central also came on the market this week under favourable auspices.

* * * *

From London it is reported that in mail week there was some bidding for Kaffirs, but the tendency there lately has been rather duller, and it would appear that the public response to the efforts on the part of professional operators to impart a livelier tone to proceedings was rather feeble. Still, Kaffirs will have their turn before long, and in the meantime advantage is being taken of the quiet spell to pick up cheap shares, especially in the Far-Eastern section. An announcement is about to be made concerning the important changes that are taking place in the Oceana Company, and which will give this concern something of an international character. As regards Rhodesians, the general tendency has been uncertain in London. Eldorados experienced a somewhat sharp decline on the poor quarterly report, and Shamvas also came on offer in connection with rumours that the reef is faulting below the third level. On the other hand, the cabled summary of developments on the Cam and Motor during April is highly encouraging. An average value of 9 dwts. is shown over the big width of 12 feet, while in the crosscut off the south drive on the fifth level values run up to 15 dwts. Tanganyikas have hardened on bear covering. More hopeful views are now held as to the statement to be made at the meeting of the Union Miniere in Brussels.

* * * *

	Friday, 24th	Sat., 25th	Monday, 27th.	Tuesday, 28th.	Wed., 29th	Thurs. 30th
African Farms ...	...	...	16 0B	16 5B	16 3B	16 6B
Adair-Usher Process	.	...	1 6S	1 0B	1 0S	1 1B
Apex Mines ...	..	...	...	...	31 9B	32 0B
Bantjes Consolidated	...	...	24 3B	24 6B	24 3B	24 9
Benonis	...	...	6 3B	6 3S	6 3	6 3B
Bushveld Tins ...	...	...	1 0B	1 1B	1 1B	1 1
Brakpan Mines ...	.	...	75 0B	...	76 3B	77 0B
Blaauwbosch ...	...	..	21 0	..	..	22 0
British S A. ...	...	...	...	27 0B	...	27 6B
City and Suburban ...	...	...	52 0B	52 0B	52 6S	52 0B
City Deeps	..	...	...	57 0B	57 0B	57 0B
Cloverfield Mines ...	...	...	6 2S	...	6 0	..
Cons. Langlaagtes ...	...	...	22 0B	22 0B	22 3	22 9
Cons. Main Reefs ...	...	...	19 9B	19 6	19 6B	19 9B
Coronation Freeholds	...	...	...	0 7B	0 7B	0 7B
Con. Investment ...	...	...	...	...	...	21 3B
Concrete Cons. ...	...	...	10 0B	10 0B	..	10 0B
Clydesdales	...	...	10 0B	10 0B	10 0B	10 0B
Cons. Mine Selections	...	...	..	...	12 0B	12 6B
East Rand Cent. ...	...	...	8 6B	8 6B	8 6B	8 6B
East Rand Coals ...	..	..	2 5	2 5	2 5B	2 5B
East Rand Deeps ...	...	...	2 6B	2 3B	2 3B	3 0S
East Rand Props. ...	..	...	61 3B	61 6B	61 6B	62 0B
East Rand Deb. ...	..	...	£94	£94	£94	£94B
Eastern Gold Mines	...	...	...	1 11S	1 10B	1 10B
Frank Smith Diam ..	...	...	9 0B	9 0B	9 3B	9 6S
Govt. Areas... ...	...	...	25 0B	25 0B	26 0	26 0
Glencoe (Natal) Colls	..	...	...	...	...	7 0S
Glynn's Lydenburgs	...	...	30 0S	30 0S	25 0B	25 6B
Ginsbergs	...	...	...	...	...	30 0S

B Buyers. S Sellers.

	Friday, 24th.	Sat., 25th	Monday, 27th.	Tuesday, 28th	Wed., 29th	Thurs. 30th.
Glencairns	...	...	4 0B	5 0S	5 0S	4 0B
Jupiters	...	...	12 6	...	12 0B	12 6
Kaalfontein Diamonds	...	...	0 8B	0 8	0 8B	0 8B
Klerksdorp Props. ...	..	...	3 1B	3 1B	3 1B	3 2B
Knight Central ...	...	...	15 3B	15 3B	15 3B	15 3B
Knights Deeps ...	..	...	45 0B	45 0B	45 0B	...
Lace Props.	...	...	3 3B	3 6	3 6	3 4B
Lydenburg Gold Farms	...	...	9 0B	9 0	8 11B	9 0
Main Reef Wests ...	...	...	25 6	26 0	25 6B	26 6B
M.R. West Deben...	...	...	...	£100	£100	£100
Modder B's	...	...	55 0B	...	55 0B	56 6B
Midas Deeps ...	...	...	0 6	0 7S	0 6B	0 6B
Middelvlei Estates ..	...	...	1 9B	1 9B	1 9	2 0S
Modder Deeps ...	...	...	...	...	29 0B	...
Meyer & Charltons ..	...	...	91 0B	...	91 0B	...
Natal Nav. Colls ...	...	...	...	...	...	16 3B
New Eras	...	...	7 9B	7 9B	7 6B	8 7B
New Kleinfonteins ..	...	...	...	...	28 0	...
New Rietfonteins ...	..	...	9 6B	9 6B	9 6B	9 9B
New Unifieds ...	...	..	17 6B	17 6B	17 0B	17 0B
New Boksburgs ...	...	...	...	...	1 9B	1 9B
Orange Diamonds ..	...	...	1 6	1 0B	1 7S	1 3B
Premiers Deferred	...	...	..	...	...	180 0B
Pretoria Cement Co.	...	...	58 3B	59 6S	59 0S	57 0B
Paardekraal Estates	...	...	1 0S	0 9B	0 9B	0 9B
Potchefstroom Est....	...	..	...	1 9B	1 11	1 9B
Princess	...	...	...	...	...	10 6B
Rand Nucleus ...	...	...	2 9B	2 11B	2 10B	3 0B
Randfontein Estates	...	...	27 6B	28 0	27 9	27 9B
Randfontein Deeps ..	...	...	4 0B	4 0B	4 0	4 0B
Rooiberg Minerals ..	...	...	35 0	36 6	36 0	38 3
Rand Klips	...	..	6 0B	6 0B	6 1B	6 3
Ryan Nigels ..	...	...	...	4 0B	4 0B	4 0B
Rood. Durban Deeps	...	...	25 0B	27 0B	26 6B	27 0B
Roberts Victors ...	...	...	...	...	17 6B	17 6B
Rose Deeps	...	...	...	...	65 0B	66 0B
Salisburys	...	...	2 6B	3 0B	...	...
Simmer Deeps ...	...	...	4 0S	...	4 0S	4 0S
South African Lands	...	...	4 3	4 3	4 3B	4 5
S.A. Tin Mines ...	...	...	7 0S	...	7 6S	...
S. Randfontein Deeps	...	...	...	3 5S	3 4B	3 6B
Sub Nigels	...	...	..	...	5 3	5 3B
S. A. Breweries ...	...	...	41 0S	...	40 6B	...
Springs Mines ...	...	..	11 0B	14 0B	14 6B	14 6B
Trans. G.M. Estates	...	...	43 9B	...	43 9B	44 0B
Temple Tins	...	...	3 10	3 6B	3 3B	3 8
Trans. Coal Trusts...	...	...	48 0B	46 0B	46 3	48 0
Trans. Cons. Lands	...	...	...	...	...	30 0
Tudors	...	...	1 0B	1 0B	1 0B	...
Van Ryn Deeps ...	...	..	20 3B	20 3	20 0	20 3B
Village Deeps ...	...	...	40 0B	40 0B	40 3B	40 9B
Vogel. Cons. Deeps...	...	..	0 9B	0 9B	...	1 0B
Voorspoed Diamonds	...	..	10 0B	10 0B	...	10 0B
Witwatersrands ...	...	...	56 0S	...	...	...
Wolhuters	...	...	20 0B	20 0B	20 0B	20 6
Witbank Collieries...	...	...	41 0B	40 0B	40 0B	40 0B
Wit. Deeps	...	...	55 0S	55 0S	53 0B	...
West Rand Est. ...	...	...	..	...	2 9B	2 9B
West Rand Con. ...	...	...	12 6S	...	...	...
Zaaiplaats	...	...	46 6S	45 0B	46 0	...

B Buyers. S Sellers.

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9

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

A Prospector on Mr. David Draper's Geology.

To the Editor, *South African Mining Journal.*

Sir,—*Re* letter written by Mr. Draper a few weeks ago, I think that all geologists do not share the same opinion, neither do all moneyed men and capitalists. When the time is ripe, we shall certainly have some more "Main Reef" opened up. It can certainly not be taken as gospel because forty to fifty miles outcropped and all companies on the full length are payable that another three times forty-fifty miles will be all unpayable, because it is covered by the southern series. And, as Mr. Draper says, outside of "Main Reef" and Du Preez, nothing has proved payable, I should like to ask what about Randfontein series? Sir Joseph would not like the idea of having his Randfontein companies marked unpayable, for the simple reason that dividends were not paid in hard cash. And what about the East Rand series?—Yours, etc.,

JOSHUA LE ROUX.

Platinum in the Black Reef.

To the Editor, *South African Mining Journal.*

Sir,—The fact, according to Mr. C. Baring Horwood, in your last issue, that the concentrates of Du Preez, or New Rietfontein, contain 1·24 per cent. of gold, and only 0·61 ditto of platinum, is a matter of academic interest only; but if my friend, Mr. Lewis Watkins, had cared to say, he could have told you, as he told me years ago, that there is platinum in payable quantity, probably, in the Black Reef of the Black Reef series, which is being worked on Randfontein, for instance, and in many companies out East, where it is dignified by the name of "the" Main Reef with "the" shale foot-wall, by the geologists. My pointer for the North Reef of the Blue Sky series is its cobalt bloom, but how much cobalt there is in it I have not investigated, as a little cobalt makes much bloom; in the same way that chalcopyrite stain leads the new-chum to believe that he has struck a copper mine. We have every mineral out of the sun in this country if our slow-coach Government would but throw it open to prospecting, instead of limiting broad minds to narrow areas. Give us the Mozambique laws and have done with it!—Yours, etc.,

SCOTT ALEXANDER,
"Rand Stratigraphist."

Johannesburg, May 28.

Round vs. Rectangular Shafts.

To the Editor, *South African Mining Journal.*

Sir,—As Mr. "M. H. C.," whose initials no doubt veil a well-known East Rand mine manager, has not replied to the letter on the above subject appearing in your issue of the 18th inst. over the name of Mr. E. Mackay-Heriot, it is only fair to the mining engineers of the Rand as a body that Mr. Mackay-Heriot should be informed that the views expressed in the letter opposed to circular shafts does not represent the views generally held here with regard to their superiority over rectangular-shaped shafts under some conditions prevailing on the Rand, as is evidenced by the letter of "Ajax" appearing in your issue of February 17th. I for one strongly object to Mr. Mackay-Heriot dubbing as a Transvaal expert any one who describes the well-known American *Engineering and Mining Journal* as an English technical paper and so prejudiced that because the writer may be an English engineer, he must necessarily therefore be considered ignorant of the methods employed in modern rectangular shaft sinking operations. Happily the time has gone on the Rand for any one holding such strange and intolerant views to be considered an expert, and doubtless the expression of such views has been the cause of such little notice being paid locally to the matter. If Mr. Mackay-Heriot paid a visit to the Rand, and after inspecting the circular shaft on the New Modderfontein property, afterwards paid a visit to the adjoining property and saw four rectangular shafts being sunk, he could not help but express the opinion that there are some engineers who cannot shake off prejudice or adapt their methods to surrounding conditions and because their great-grandfather sank rectangular shafts in the days of early mining, modern mining conditions, however changed, cannot make the adoption of circular shafts advisable.—Yours, etc.,

VULCAN.

Iridosmine from the New Rietfontein Mine.

To the Editor, *South African Mining Journal.*

Sir,—Without wishing to play the role of the carping critic, I feel impelled to traverse certain portions of Mr. Horwood's article on the above.

After reading the paper with due care, it is quite clear that its only objective is to establish the hypothesis contained in the conclusions, and emphasised in the second part of the article, viz.: That as the sedimentary beds of the Witwatersrand system contain those metals which have their origin in the basic and ultra basic igneous rocks, therefore, our banket beds could not originally have contained those metals, but that they were extracted from the dykes by active super-heated gases, while later hydrothermal action probably played a great part in concentrating them in the bankets.

Mr. Horwood claims that he is justified in his conclusions by the evidence he produces, but, with all respect, I maintain that he has produced no such evidence. We have the statement that the home of the metals of the platinum group, and of nickel ores, is in the basic igneous rocks reiterated, needlessly so, for the fact is undisputed. We are also told that our pay reefs carry those metals, many of us have known this for years; but these facts do not preclude the possibility of iridosmine and other allied metals being an original constituent of the bankets, as Professor Young says. He also states that he found these metals occurring in rounded and flattened grains, as well as in rhombohedral crystals; a statement in clear opposition to Mr. Horwood's. Even were it not so, it would be of little importance, as it is admitted that the original metallic contents of a sedimentary bed would naturally undergo physical alteration as well as molecular reconstruction as a result of pyrometamorphism due to the intrusive dykes. Mr. Horwood's hypothesis insists upon the metal barreness of the whole of our sedimentary formations, until such time as the intrusive dykes tilted, fractured and fissured the superincumbent mass, the soluble metallic contents of the intrusive matter then permeating, not the whole of the overlying sedimentary rocks—already consolidated and indurated—not even the whole of the banket beds, but one banket reef here, and another of sandstone there. I submit that a serious consideration of the facts will lead to the adoption of the alluvial theory and the abandonment of such a hypothesis. The statement contained in par. 3, under the heading "Genesis," as to the similarity of ordinary quartz veins to the Rand bankets, will be regarded by most of the readers of the *S. A. Mining Journal* as being in direct opposition to the accepted belief, viz., that the quartz vein is simply the recrystalised matter deposited out of solution which filled the fissure, and which is metalliferous or not, just as the solution was charged with the metals or not. On the other hand, our banket beds, laid down horizontally, more or less, were made up of detrital matter, derived by erosion, etc., from older formations, and these beds are metalliferous or not, just as the rocks to which they owe their origin were barren or not. That there is an enrichment at the junction of dyke and reef is a most natural condition to expect, it being due to the metals of the beds flowing towards the position of greatest heat, at the point of the intrusion of the basic dykes.

The greater portion of the article deals in detail with the iridosmine found in our bankets and its physical and mineralogical features, but in no way affects Mr. Horwood's hypothesis. For instance, take the two last sections of par. 2: how do they help Mr. Horwood in arriving at his conclusions? We are told that 102,800 tons (why not 102,799 tons?) of rock yielded 910 grains of iridosmine as against 52,500 ozs. fine gold, and this is made the basis of a calculation to harmonize with that of Vogt in the preceding par. Are we to believe that the 910 platiniferous grains comprised the whole of the platiniferous contents of the 102,800 tons of rock crushed? It proves miraculous work indeed to be able to treat rock, 1,000 tons of which contain nine grains of metal, and recover the whole of it. If it is not intended to convey this, why are the figures used to institute a corrollary and comparison? Lastly, Mr. Horwood is guilty of the very common error of confounding the terms genesis and origin. He has not dealt with the genesis of the metals for a very simple reason. Professor Duncan —as quoted by the author—says: "If one could explain why the elements of high atomic weight are rare, then we should probably have the explanation of the genesis of matter." To trace the origin is a vastly simpler pursuit than explaining the genesis of the elements. The truth is that when chemistry or physics is able to explain the genesis of matter, the great secret of creation will stand revealed.

May I say, in conclusion, that while Mr. Horwood's latest contribution is of special interest, it is purely academic, but does not help in solving the every-day problems confronting the worker. After all, *the important problem* with us is the economical extraction of the payable metals from the rock, and, nothwithstanding the high falutin indulged in at times, by some of the scientific brotherhood, the problem is still in the solving. Can it be denied that too much time is devoted to the discussion of subjects of purely academic interest at the expense of real practical work.—I am, etc.,

LEWIS WATKINS.

[As pointed out in an article which appears in another part of this issue, what Mr. Watkins calls "purely academic" work is likely, if properly carried out, to have useful results on the economic side. The question of the origin of the gold in the Rand banket is precisely one of those "academic" problems that may have considerable bearing upon the work of the prospector.—Ed. *S.A.M.J.*]

Transvaal Oil Shale Syndicate.

The Transvaal Oil Shale Syndicate, Limited, has been formed to acquire a portion of the Mooifontein Farm, situate about nine miles north-east of Ermelo, in the Transvaal. The property is 2,419 acres in extent, and the Belfast-Ermelo Railway passes through it. The company acquire the right to a lease of the property for a term of 99 years from June, 1912, at a rental of £400, rising to a maximum of £600 per annum. The company will have the right of acquiring the freehold mineral rights at the price of £5 per acre, or the absolute freehold at the price of £6 10s. per acre, at any time during the whole period of the lease. It is stated that the property possesses great advantages for economical working, as the railway runs through it, while coal is on the spot, and can be worked immediately from the adits to a sufficient extent for development. Approximately £12,000 is stated to have been expended in proving the shale and coal seams upon the property by the predecessors in title to the vendors. The seams near the surface have been proved by a series of shafts and adits, and the deeper seams proved by borings. During the past two years the Middleburg Steam Coal and Coke Company has carried out a considerable amount of work, with the object of verifying the reports upon which they acquired the property. The capital is £60,000, in £1 shares, the whole of which are now offered for subscription at par. The syndicate will be in the position of a parent company; it will as a preliminary put down the necessary shafts to the large No. 4 seam of oil shale, and thoroughly open up and test the various seams of oil shale and coal by drives from these shafts. It is intended, as the developments reach a point where a large daily output can be assured, to dispose of the property as a whole, or in portions, to one or more subsidiary companies, which will instal the necessary equipment for distillation and the manufacture of the various products on a large scale.

Mr. A. R. Sawyer has left for England.

* * * *

Mr. Dashiels, of the New York Lubricating Company, is visiting the Rand.

* * * *

Mr. W. Henderson-Clark, London, managing director of the Anglo-French Exploration Company, will arrive on a visit to the Rand next week.

Rand Mines, Limited.

(Incorporated in the Transvaal.)

Notice to Shareholders of a Special General Meeting.

NOTICE is Hereby Given that a Special General Meeting of Shareholders in the Rand Mines, Limited, will be held in the Board Room, The Corner House, Commissioner Street, Johannesburg, on WEDNESDAY, the 5th day of JUNE, 1912, at 10.45 a.m., for the following purposes :—

To consider and if thought fit to resolve, in pursuance of Article 80 of the Company's Articles of Association, that the maximum number of Directors be increased from seven to eight.

The Transfer Books of the Company will be closed from 5th June to 11th June, 1912, both days inclusive.

Holders of Share Warrants to Bearer wishing to be represented at the Meeting must deposit their Share Warrants, or may at their option produce same, at the places and within the times following :—

(a) At the Head Office of the Company in Johannesburg, at least 24 hours before the time appointed for the holding of the Meeting.

(b) At the London Office of the Company, No. 1, London Wall Buildings, E.C., at least 30 days before the date appointed for the holding of the Meeting.

(c) At the Compagnie Française de Banque et de Mines, 20, Rue Taitbout, Paris, at least 30 days before the date appointed for the holding of the Meeting.

Upon such production or deposit, a Certificate with Proxy Form will be issued, under which such Bearer Warrant Holders may attend the Meeting either in person or by proxy.

By order of the Board,

RAND MINES, LIMITED,

H. A. READ, Joint Secretary.

Head Office, The Corner House, Johannesburg,
12th March, 1912.

Electrical Notes.

Resuscitation from Electric Shock.

The Commission on this subject appointed by the American Medical Association, the National Electric Light Association, and the American Institute of Electrical Engineers, has adopted the Schaefer system as the best method of resuscitation, and is preparing a chart giving details of first aid and describing the method.

New Tests for Insulated Wire.

The *India-rubber World* quotes the revised set of electrical regulations issued in 1911 by the Electrical Department of New York City, which provide that the insulation shall be of rubber or other homogeneous compound which has been approved, and specify a definite thickness for each size of wire. As a protection against too soft an insulation, the rules stipulate certain tests, among which is the following: The braiding is carefully removed from a portion of the sample, and the copper wire is connected with one terminal of an electric circuit, of which a testing tool forms the other terminal. The portion of the sample from which the braiding has been removed is placed on a flat surface, and the tool edge, which is placed across the sample, is pressed down on to the insulating cover with a pressure of 5 lb., which is maintained for about a quarter of an hour. The electric current, which must be at least 100 volts alternating, is then turned on, and the tool edge must not sink far enough through the insulation to touch the copper wire and complete the electric circuit—a pretty hard test for a small wire, but one to which the best manufacturers have agreed.

Electrical Engineers.

The South African Institute of Electrical Engineers held their usual monthly meeting at the School of Mines this week, when Mr. J. H. Rider presided over a large attendance of members. Messrs. T. H. Roberts, C. Shaw and W. M. Tennick were elected associate members of the Institute. Mr. W. E. Dixon Bennett replied to the discussion on his paper on "Radiotelegraphy in Modern Practice," in the course of which he stated that the Durban Bluff wireless station was not entirely dependent on current supplied from the main railway electrical plant, as a stand-by plant consisting of a 6 h.p. petrol engine and generator was provided at Wests Railway Station, close to the wireless station, which could supply current in the course of a few minutes. The maximum distance of working at night seawards from the Bluff was now well over 2,000 miles; but during the day the maximum was only about 600 miles. Considerable improvements had been made at the Slangkop station, which was now working satisfactorily at good distances up the West Coast, messages having been received from the incoming mail steamers 1,400 miles away. Recently Mr. Marconi had transmitted a greeting to the *New York Times* from Coltano, Italy, to Glace Bay, Nova Scotia, a distance of 4,000 miles, which was the latest achievement in wireless telegraphy. An interesting discussion was opened by Mr. C. W. R. Campbell on "The Design and Installation of Transformers from an Operating Point of View." The opener of the extempore discussion, which was highly technical, was followed by Messrs. Bernard, Woodworth, Webb, A. G. F. Heather, Professor Buchanan and C. S. Wright.

Our Twenty-First Anniversary Number.

THE LAST WORD ON RAND MINING.

To commemorate the twenty-first anniversary of the founding of this journal, a special number, distinct from the ordinary weekly issue, will be issued in July next. Fittingly to mark the occasion, the number will contain a comprehensive and concise account of the past history, achievements and present position of every gold mine on the Rand, illustrated and brought down to the latest possible date. It will review the industry generally as well as in its several technical aspects, and will include articles by experts on the chemical, mining and metallurgical progress and problems of the fields. A feature will be made of the personal side of the industry, and a section will be devoted to its technical and administrative leaders, enriched with portraits and other illustrations. Engineering on the Rand in all its phases, electricity, steam and air power will be treated, and the growth and progress of electric power supply will be exhaustively discussed. The gold mines of the outside districts and the tin, copper and coal industries of those districts will be dealt with thoroughly and at first hand. The great diamond industry of South Africa will have a section to itself, and here, as in the treatment of the base metal industries, the letterpress will be embellished with many striking and original illustrations. Mining in the Cape, Natal and Orange Free State Provinces will also be reviewed and the undoubtedly great mineral potentialities of those, as yet undeveloped, areas will be graphically set forth. German South-West Africa will find a place in the issue and a first-hand account of the diamonds, the copper and the tin mines of that promising field will be included. Moreover, the banks and other great financial institutions, the railways and harbours of the sub-continent will be adequately dealt with, and the whole problem of transportation as it affects the inland industrial centres will be reviewed. In this connection Capetown, Port Elizabeth, Durban, East London, Delagoa Bay and Beira will be separately and fully treated and their claims examined. Apart from mining, there will be a considerable section devoted to a description of the several subsidiary industries dependent on mining for a market. Chief among these will be cement, explosives, soap and candle-making, milling and the hundred and one activities that centre in the Rand. Rhodesia and Mozambique will be given a separate and extended treatment. The different mines will be described and illustrated, and the recent progress of the industry in those territories dealt with comprehensively and lucidly. In addition, the issue will contain a number of interesting and valuable contributions from leading men in the mining and financial world. many of whom have already sent their congratulations on the decision to issue a special commemorative number of the journal. Numerous letters received from past Rand engineers and mine managers, now resident in all parts of the world, contain offer of contributions. These will form a unique collection of valuable views and reminiscences, and will considerably enhance the interest of the volume. The work will consist of upwards of 350 pages, printed throughout on art paper. Prizes are offered to artists for the best design of a suitable and striking character, and particulars are given in another part of this issue of other valuable prizes to be awarded in connection with the number. It may be added that the work will be prepared, produced and printed in South Africa, and will aim to cover the whole field of mining in this country, and to prove a fitting monument to the great industry with which, from the beginning, the *South African Mining Journal* has been associated. The co-operation of everyone interested in the industry is being enlisted to make the venture a success, and already it promises to mark an advance on anything of its kind ever before attempted in South African illustrated journalism.

Mr. John Hart, one of the directors of the British Finance Co., Ltd., died of malarial fever on the Ellerton Mine, at present owned by the Unity and Victory G.M. Co., Ltd., of which the late Mr. Hart was the managing director.

The *Gwelo Times* hears very favourable reports of Mr. Tranmer's mine on the Lundi River, and that it will be one of the next producing mines in the district. It seems to be on the same line of reef as the Pretty Polly, and may turn out equally good.

INVESTORS' DIARY.

The following company meetings have been announced:—

June 4.—Ferreira G.M.; Modder B.
June 5.—Rand Mines.
June 7.—General Mining and Finance Corporation.
June 21.—New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.
June 26.—Transvaal Consolidated Lands.
June 28.—A Goerz & Co.
July 19.—Transvaal Consolidated Lands.

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Engineering Notes and News.

FUTURE DEVELOPMENTS OF THE GAS ENGINE.

Mr. Alan Chorlton, of Messrs. Mather & Platt, Ltd., Manchester, made some interesting remarks indicating the lines on which future developments of the gas engine are likely to take place, in the course of a paper on "Large Gas Engines," which he read recently to the Manchester Association of Engineers. Experiments have determined, he said, that on its present principle the economy of a gas engine will not be materially increased, and the question must, therefore, be looked at from other points of view. The particular type of engine that will ultimately prevail in the near future is difficult to determine, and one can only attempt to judge of it by what is taking place at the immediate present. From this Mr. Chorlton is inclined to predict considerable expansion in the use of the two-stroke type. It would seem that this type is likely to be largely used for car work, while for Diesel engines for ship propulsion it is the most suitable cycle which makers can use.

There is little doubt in Mr. Chorlton's opinion that at the present time the chief hindrance to the progress of the utilisation of large gas engines in the extensive manner which their thermal efficiency warrants is their somewhat high first cost. To reduce this the present maximum pressures and temperatures must be lowered and a better proportion obtained between the maximum and mean pressure; one authority suggests but two to one. To the practical engineer, with the necessity of the immediate future before him, this point of view (reduction of first cost) is the one which must strongly present itself. If the engine could be reduced down to a first cost more nearly that of a similar steam engine, it is safe to say that there would be a much greater use of large gas engines. Gas engineers are well aware of this, and many are no doubt investigating the subject on different lines. It seems obvious that these efforts must largely be in the way of simplification of the plant, and must reduce the present weights and strengths that are now necessary for the high compression economical engine. It is thought by some engineers that the constant burning type of gas engine is one of the most promising ways in which these results can be obtained, and work appears now to be going on in Great Britain in the development of this type.

The reduction of compression and maximum pressure in the standard engine means, of course, an increase in gas consumption, and therefore this *per se* is hardly an advisable course to adopt, but if we add to such an engine, said Mr. Chorlton, an improved method for utilising the waste heat of the jackets and exhaust, we find that the original economy is recoverable. Such a design involves the addition of an exhaust boiler and a simple but highly efficient steam cylinder. Whilst perhaps this is too costly an arrangement for the small value realisable from the waste heat of an economical engine, it is not so when the gas engine is specially designed for this purpose. This arrangement of a combined steam and gas engine is by no means a new one, and has appealed to many engineers. It seems to be one that is particularly applicable to engines of the two-cycle type from the fact that a boiler can be arranged very near to the cylinder, and that the loss of heat to the exhaust value, and during the exhaust stroke to the jacket is avoided. Referring to an illustration showing diagrammatically such a tandem compound engine, the exhaust boiler occupying the place of the reheater receiver of steam practice, Mr. Chorlton proceeded: It is interesting to determine the possibilities of such an engine. Let us take in the first instance the addition of a steam end to a normal economical gas engine. Assuming a standard engine to use 9,500 B.T.U. per B.H.P., then as ordinarily arranged with jacket feed to the boiler we may take 40 per cent. of this amount as recoverable, and at 80 per cent. efficiency of conversion at 100 lbs. pressure we get about 2½ lbs. steam per B.H.P. This in an ordinary simple steam engine would not give more than 10 to 12 per cent. of the main engine power. This amount of power is low and consequently it is realised that it hardly, if it at all, justifies the first cost of the steam cylinder, and consequently no development has taken place in this direction.

Now dealing with a special combined compound engine, each part of which is made in the most suitable way for the purpose required, we get a very different result. As has been said, in order to reduce the cost of the gas engine part the compression would be lowered, and with the ignition retarded, a much lower maximum pressure and temperature would result, the total heat units used would go up say to 12,000 B.T.U., but more would be rejected to exhaust; then with a special arrangement of boiler, economiser pipes, superheaters in exhaust, etc., 50 per cent. waste heat should be recoverable. The following figures should then be obtained:—

$$\frac{12{,}000 \times 50 \times 80}{1{,}185 \times 100 \times 100} = 4{\cdot}0 \text{ lbs.}$$

The steam cylinder used would be similar in type to the two-cycle gas one, *i.e.*, with no exhaust valves, as has been re-introduced largely in Germany as the Gleichstrom Maschine, with very economical results, and the jacketing of the ends could be done by exhaust gas. On small engines with this cylinder a consumption of 10 lbs. of steam has been obtained, so it will be safe to take 12 lbs. per B.H.P. This gives a power from the cylinder of one-third that of the gas cylinder and consequently reduces the consumption for total effective power to 9,000 B.T.U. per B.H.P., *i.e.*, less than the economical gas engine alone. The total cost should be less, for we have, taking approximate prices of gas engines at £5 per I.H.P. and steam at £3: Three-quarter gas engine at a reduced cost (lower pressures), say £4·00 per I.H.P., one-fourth steam cylinder (less special crank and valve drive but including exhaust boiler) at £3. The approximate comparison then is per I.H.P.:—

Gas Engine.	*Steam Engine.*	*Compound Engine.*
£5.	£3.	£3·75.

With the use of such an engine for mill driving purposes, in comparison with steam and gas engines, we reduce our capital cost somewhat and increase our savings per year. Such a steam auxiliary cylinder has other advantages outside economy. It is an excellent method of starting the engine, or for marine work for reversing, and it provides a means for the gas engine taking a considerable overload, so we may look for some considerable progress in this direction in the near future, as well as in other and more novel forms, such as the "Humphrey," "Turbine," "Brayton Engines," etc.

The New Found Out.—Cable: Crosscut from bottom of winze at 90 ft. below No. 6 level shows reef is 72 ins. wide, assaying 19 dwts. per ton. Prospect of length and breadth of ore (body) increasing, encouraging."

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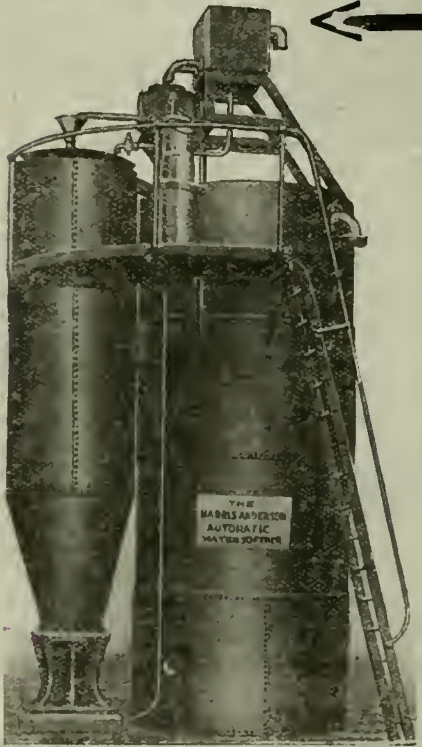

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Absolutely
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Fitted in
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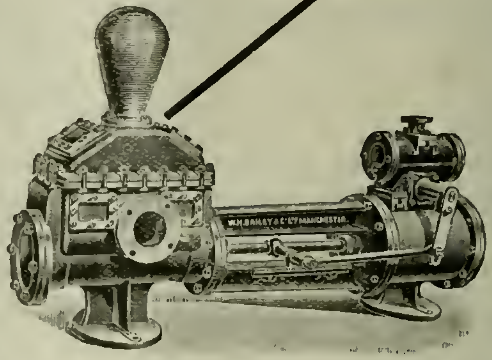

Fig. 1D.—"Davidson" Boiler Feed Pump.
For any Pressure with Pistons or Rams.

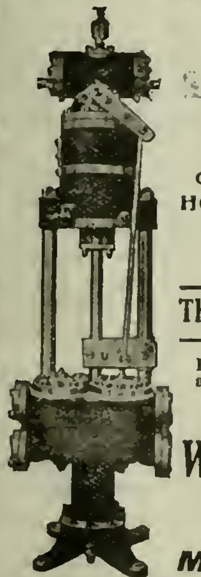

Fig. 50d.—'Davidson' Economical Boiler Feed Pump.

BAILEY'S "DAVIDSON" PATENT
STEAM PUMP
OF HIGHEST ECONOMY.
HOLDS THE RECORD FOR DURABILITY.
Uses 50 per cent. less Steam than Ordinary Pumps. Absolutely Positive in Action. Horizontal or Vertical.

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Finance, Commerce, and Industries.

Building Activity. Seven municipalities in the Transvaal Province during the month of April approved plans having an estimated value of £135,611, as against £136,477 for the month of March, showing a decrease of £866, and six municipalities in the Cape Province approved plans having an estimated value of £16,021. The Durban Municipality passed plans having an estimated value of £17,037.

* * * *

Commercial Exchange. On Tuesday of last week the East Rand Proprietary Mines opened a buying office in the Commercial Exchange. All the groups are now represented, and it is expected that a few large miscellaneous buyers will eventually take an office in the Commercial Exchange to facilitate business for themselves and the small army of brokers.

* * * *

B.S.A. Explosives. In spite of the fact that the dividend is raised from 5 to 7½ per cent., it would not appear that the results of the British South African Explosives Company for the year ended 31st October last were quite so good as for the preceding twelve months. According to the report, just issued, the net profits amounted to £63,600, or £100 more than for 1909-10, but this is after deduction of depreciation, to which only £22,800 was set aside this time, as against £25,400 in the previous year. Moreover, the profit includes £14,600 on interest account, as compared with £12,400. The net earnings, however, were amply sufficient to cover the increased dividend, which absorbs only £49,500, and the balance carried forward is, consequently, increased from £199,600 to £213,700. The directors state that the sales of explosives were a little larger than before, and the management was fortunate in having covered the Company's requirements of glycerine by anticipatory purchases at prices considerably lower than those ruling throughout the year.

* * * *

How not to Build a Railway! The Inhambane correspondent of the *Lourenco Marques Guardian* writes that the construction of the railway there is proceeding very slowly. The only engine that was available has been laid aside for repairs, although it was new three months ago! All work, therefore, is practically at a standstill. The engine that the engineer, Mr. Dendonza, bought from the Union Railways had not arrived, although it was delivered in Delagoa at the beginning of last month to be packed and sent on to Inhambane. Several wires have been sent to Lourenco Marques to the authorities to expedite its despatch, but they do not reply, and in the meantime the staff at Inhambane is taking it easy drawing their pay. Again, a whole shipment of rails, sleepers, bolts, etc., has been discharged in front of the magazine and is now lying 6 feet deep in the salt water, and nobody seems to know when it will be removed. Salt water, at any rate, will not do the rails any good! In addition came a shipment of about 400 casks of cement, the greater part being in a fearful state, and also a lighter-ful which took in water, the result being that the cement formed into blocks and had to be cut out with picks. This, as all will agree, is a scandalous state of affairs; it certainly seems that money is no object to the Government! To cap all, it is found that there is no stone available for the erection of the bridges, and, as if to complete the volume, the railway store-keeper is suspended owing to an alleged deficiency in stores and coal!

* * * *

Victoria Falls Power Co. In accordance with the powers obtained at the extraordinary general meeting held last month, the Victoria Falls and Transvaal Power Co., Ltd., have issued £1,000,000 in Five and a-Half per Cent. Second Mortgage Debentures, part of an authorised total of £2,000,000, ranking immediately after the £3,000,000 First Debentures already outstanding. The bonds are offered for sale through Messrs. Emile Erlanger and Co. at the price of 96 per cent., and are redeemable within twenty-four years by purchase or annual drawings at 103 per cent., by means of a cumulative sinking fund. The main facts regarding the issue are given in the form of a letter from the company to Messrs. Erlanger and Co., in which it was stated that, though the third and largest station, with a capacity of 84,000 horse-power, was only brought into commission in March, 1911, the net profits for that year, after allowing for depreciation and interest on the First Debentures, amounted to £130,000. A fourth station at Vereeniging is nearing completion, which will bring the total power up to 156,000 horse-power. The original scheme for obtaining power from the Victoria Falls has, of course, never been proceeded with, and the proceeds of the present issue will be devoted to the erection of further plant, which will increase the total capacity to 232,000 horse-power. It is stated that contracts have been entered into for the sale of current to the full capacity of the plant, and on this basis the future profits, after deducting First Debenture interest, are estimated at £510,000. The sinking fund on the First Mortgage Debentures, which commences in 1917, will require £165,000, and interest and sinking fund on the Second Debentures £80,000, leaving, after allowing for administration charges, a surplus of £241,000. The increase in the company's earning power during the past year has been rapid, and, if continued, as expected, a fair margin of security would be shown behind the Second Debentures, but the latter must be regarded as a speculative lock-up.

* * * *

Railway Classification of Machinery. A circular has been sent out by the General Manager, S.A.R., inviting an expression of the views of Chambers of Commerce on certain changes proposed to be made with reference to the classification of machinery in the Tariff Book. The circular in question sets forth: (1) That experience had shown that the list of component parts of machinery published on pages 204-205 of the Tariff Book was not sufficiently comprehensive, with the result that unnecessary correspondence was involved in queries and interpretations, and the question of revising the classification in this respect was now under consideration. (2) It was proposed to publish a list of the different classes of machinery entitled to be carried at Tariff 2, *e.g.*, mining, drilling, brickmaking, screwing, sawing, moulding, brewers' corking, and the like, and these would appear as follows in the classification: Machines and machinery, e.o.h.p., not mechanical power driven, 1; machinery—mechanical power driven—and component parts thereof, e.o.h.p. undamagable, 2, it being necessary to specify classes of machinery. To obtain the benefit of the No. 2 rate consignors have to specify the actual description of machinery on consignment note, and endorse thereon the words, "Mechanical power driven." If a consignment consists only of component parts, the following declaration must be made on the consignment note: "I hereby certify that the articles specified on this consignment note consist exclusively of bona-fide parts of (here insert description) mechanical power driven machinery," and unless the foregoing was observed tariff 1 would be charged. (3) In order that the list of classes of machinery might be as complete as possible, the department asked for the particulars of classes of machinery in which the Chambers were interested, and also the Chambers' views on the proposed change. (4) It would be observed that it was proposed to abolish the list of component parts. A notice from the General Manager, S.A.R., states that concurrently with the next issue of the Tariff Book it was proposed to introduce the principle of calculating charges for the carriage of timber on the actual or computed weights at the option of the Administration. The practice of the Government Railways in South Africa has hitherto been to charge for the carriage of timber on computed weights only.

Trackless Trams. In a special report on the tramway scheme, the Works Committee of the Germiston Town Council say that they are still of opinion that the track system is preferable to the trackless, but in view of the strong report submitted by Mr. H. N. Thomas, general manager of the Durban Municipal Tramways, in which so much emphasis is laid on the efficiency and suitability of the trackless trams, the difference in capital cost, the fact that they have compared his estimates of expenditure with those of the Town Engineer, and that they correspond so closely; also that previous estimates of revenue have, they think, been excessive; and finally, the emphatic statement by Mr. Thomas that a track tram would not pay, they are of opinion that the trackless should be adopted in preference to the track system. The committee's intentions are that in drawing the specifications (assuming that the Council will adopt the trackless system), provision shall be made for competitive tenders, and that the system to be finally selected will be reported upon when the tenders are received. The committee will recommend at a meeting of the Council to be held to-morrow that the Council approve of the principle of the adoption of a scheme of trackless trams in preference to track trams, that the schedule of tramway routes as detailed in the report of Mr. Thomas be adopted, and that an expenditure of £40,000 for carrying out and completing the work.

* * * *

Commercial Travellers' Licences. The conditions under which licences are at present issued to commercial travellers representing houses not domiciled in the Union are as follows:—Cape Colony: £50 per annum for the first house represented; £5 per annum for each additional house; maximum, £100. Transvaal: £10 per annum, or £6 half-yearly. Natal: £10 per annum. O.F.S.: £5 every three months. An undomiciled traveller's licence would therefore cost for the whole Union, minimum, £80, estimating that he visited the O.F.S. two seasons during the year; and maximum, £140. The proposals made by the Durban Chamber of Commerce last year and communicated to Government are as follows: Every traveller or agent or firm of travellers or agents trading in bona-fide partnership (excluding an association of travellers or agents), acting as representatives of one or more persons or firms not domiciled within the Union, must obtain a licence for the purpose of carrying on their calling. The charge for such licence to be:—For the Union of South Africa: £100 per calendar year, £50 per half calendar year. For the Cape Province only or for the Transvaal Province only: £50 per calendar year, £25 per half calendar year. For the O.F.S. Province only or for the Natal Province only: £25 per calendar year, £12 10s. per half calendar year.

* * * *

Following a German Example It is interesting to note that, following the German example, a British firm—Messrs. Callender's Cable and Construction Company—are now engaged in forming a bank, or a company which will serve the same purpose, to supply them with capital, and enable them to offer to accept shares in sound undertakings abroad in payment or part payment of contracts for the installation of plant. We expect to see many similar institutions established in future; and in course of time, when the investing public will have learnt the value of the new principle as a costless means of protecting British industries, it should come to pass that foreign and Colonial undertakings will find it difficult, if not impossible, to raise capital without offering to purchase the plant they may require from British manufacturers. Shareholders could readily satisfy themselves as to such an undertaking being duly carried out, in cases where tenders were not invited by public announcement, and while British manufacturers enjoy their reputation, there should be no hardship for a company in having to give such an undertaking. It might be difficult for Great Britain to adopt the new principle, notwithstanding that it is still investing much more capital abroad every year than any other nation, if other countries showed no disposition to follow her example and protect their industries. As a matter of fact it is largely because Messrs. Callender find their foreign competitors offering financial facilities in order to secure important contracts that they are embarking on their banking scheme.

* * * *

Cape Grown Tobacco. Two years ago the Capetown Chamber of Commerce organised the first sale of locally grown Turkish and Virginia tobacco. These sales have become an annual institution, and the third of them has been arranged to take place on June 3, when Mr. J. W. Jagger, M.L.A., as President of the Capetown Chamber of Commerce, will open the sale. The amount offered for sale in 1910 was 6,288 lbs. This increased to 21,419 lbs. at last year's sale, and it is expected, judging from the reports of growers, that no less than 100,000 lbs. will be forthcoming for the sale announced above. The tobacco in 1911 came from French Hoek, Eerste River, Paarl, Wellington, Tulbagh and Worcester, and each year has seen a larger number of growers sending in their produce. While the amount realised by the first auction was £564, last year the total rose to £1,878, and a sum of over £10,000 is expected from this year's sale. The Chamber of Commerce has taken a further step to encourage this industry by reducing the auctioneer's fee from 2½ per cent. as hitherto charged, to 1½ per cent. For Turkish tobacco the highest price realised in 1910 was 3s. 6d. per lb., and the average price 2s. 2¾d., while last year the figures were 2s. 7d. and 2s. 0½d. respectively. The average price obtained for Virginia tobacco at the 1910 sale was 8¾d. per lb., and at last year's sale 8½d. This industry is regarded as being in its infancy, as the soil and climate are favourable to the cultivation of cigarette tobacco, and it is, therefore, contended that the conditions are also suitable for growing the best class of cigar tobacco, which commands a practically unlimited market and yields a very high return.

BULLIVANTS'
STEEL WIRE
MINING ROPES

WIRE ROPES
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Contracts Open

The Chairman of the Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for the following services in the Transvaal Province: Alterations and additions to North School at Potchefstroom (June 28).

The Chairman of the Union Tender Board, Box 371, Pretoria, invites tenders for the supply, delivery, and fixing in position where necessary, certain show cases, furniture and fittings, to the Public Museum at Bloemfontein (July 31).

The Chairman of the Tender Board, Attorney-General's Office, Pietermaritzburg, invites tenders for the reconstruction of Prince's Bridge, Umgeni River (Albert Falls), (June 21).

The Chairman, Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of the following services to the Department of Irrigation:—Specification, 1,460 standards, about 14lb. weight each, six holes, galvanised iron or steel, for fence of barbed wires; 4,360 droppers, to suit same fence; 204 rolls two-ply four-point barbed galvanised fencing wire, barbs 6 inches apart; 7 rolls binding wire (June 12).

The Municipality of Benoni invites tenders for the erection of fire brigade station and quarters, and additions to Municipal offices (June 19); also for the supply of licence plates and badges for the year 1913 (June 27).

The Municipality of Ladismith, Cape Province, invites tenders for the supply of six inch steel pipes and other incidentals thereto for the proposed water scheme (July 15).

The Municipal Council of Johannesburg invites tenders for the supply of sanitary pails and lids (August 2nd), licence plates and badges (2nd August), steam piping (June 28), rolled steel joints (June 13); also for the supply and deilvery of a number of electricity meters (June 12).

The Municipal Council of Krugersdorp invites tenders for 10 lengths of 100 feet each 2½ inch canvas hose for fire brigade purposes (June 3).

Messrs. Gibson & Robertson, architects, Main Street, Bulawayo, invites tenders for the erection of new post, customs, and Municipal offices on a site having frontages to Main Street and Selborne Avenue, Bulawayo (June 29).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of 904,625 hardwood sleepers or (alternatively) creosoted Baltic sleepers (July 23).

The Municipality of Pretoria invites tenders for the supply of approximately 2,400 square yards of concrete or stoneware aerating tiles (June 7).

The Corporation of Pietermaritzburg invites tenders for the supply of one steam turbine with tandem generators, switchboard, and condensing plant (July 29).

The Buying Department, Farrar Anglo-French Group, Farrar Buildings, Johannesburg, invites tenders for the supply and delivery of sound new season's (1912) white mealies to the mines of their Group.

The Secretary to the Tender Board, South African Railways Headquarter Offices, Johannesburg, invites tenders for the supply of 60 lb. and 80 lb. section rails and fastenings to drawings, Type E.100 and E.200 (July 2)

The Rand Mines, Ltd., Buying Department, Box 1594, Johannesburg, invites tenders for the supply of the whole or any portion of the requirements of mealies to the Companies controlled by the Rand Mines, Limited, for a period of twelve months from 1st July, 1912.

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of oils (June 11); also for asphalt paves (June 4); also for bridgework to form extension of foot bridge, Witbank (June 11); also for the supply of 36,000 casks of Portland cement (June 18); also for the supply of writing and printing paper, boards, etc. (June 9)

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for structural steelwork, etc., for new foundry at Pretoria (June 4)

The Secretary to the Tender Board, S.A.R., Headquarter Offices, Johannesburg, invites tenders for the supply of 2,741 Petersburg standards of Baltic timber (June 11).

The Municipal Council of Johannesburg invites tenders for mackintoshes (June 1); also spares for stone crusher (June 14).

The Municipality of Boksburg invites tenders for the supply of rolling stock, converter plant, and overhead material, required in connection with trackless tramways (June 26).

The Municipal Council of Krugersdorp invites tenders for the supply of steel water pipes, etc., for the period from 1st July, 1912, to 30th June, 1913 (June 13).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of 600 posting books, required for use in the Customs Department (June 12); also for the supply, delivery, and fixing in position where necessary, certain furniture and fittings for the Post Office at Durban (June 19).

The Chairman of the Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for the erection of a school for 150 pupils at Krugersdorp West (June 14).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the following services, viz.: Fencing at the Leper Asylum (June 5); erection of police buildings at Bushbuckridge, Maviljen No. 250 (June 12); drainage system and sewerage purification works at the Asylum, Fort Beaufort (June 12).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of Oilskin Capes and Mackintosh Overall Leggings to the Department of Posts and Telegraphs during the period 1st July, 1912, to 31st March, 1915. The approximate annual requirements are 500 black oilskin capes and 500 black mackintosh overall leggings (June 5).

The Chairman of the Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for the following services in the Transvaal Province: Erection of boarding house, Girls' High School, Pretoria (June 7); additions to male surgical ward at the Boksburg Hospital (June 7); erection of a surgical and medical ward and operating theatre for female natives at the Boksburg Hospital (June 7).

The Chairman of the Tender Board, Provincial Secretary's Office, Bloemfontein, invites tenders for the erection of a bridge over the Modder River (June 11).

The Orange Free State Tender Board invites tenders for the supply of forage to the S.A. Police in O.F.S. (June 5).

The Chairman of the Tender Board, Attorney-General's office, Pietermaritzburg, invites tenders for the erection of a school building at Paulpietersburg (June 3); erection of a bridge over the Slang River (June 10).

The Municipality of Frankfort, O.F.S., invites tenders for the supply and erection of the pipe services and machinery in connection with the Town Water Supply (July 4).

Contracts Placed.

The tender of the British General Electric Co. has been accepted, for the supply of Edison Lalande Cells and renewals to the Department of Posts and Telegraphs:– 100 Edison Lalande Cells, 250 sets renewals for do., £156 17s. 6d. The following tenders have been accepted for the various services mentioned, viz.:—T. F. de Bruin, P.O. Deelpan, Lichtenburg, £889; erection of teachers' quarters at Leeuwkuil No. 23, Lichtenburg; A. E. Ordbrown, Box 2895, Johannesburg, £615; erection of school for 64 pupils at Modderbult No. 328, Heidelberg; Bracher & Andrew, Box 182, Potchefstroom, £1,787; erection of school and quarters at Haaskraal No. 173, Potchefstroom; W. H. Birt, new school, Bethlehem, £6,996; erection of a hostel at Bethlehem, Orange Free State; Wm. Bain & Co., Box 2724, Johannesburg, £5,387 6s., erection of a bridge over the Groot Vet River, District Winburg, Orange Free State.

Our Special Issue.

Owing to delay in the arrival of supplies of paper, caused by the strike in Great Britain, and for other minor reasons, it has been decided to postpone the issue of the Special Majority Number of this journal—which will be separate from the ordinary weekly issue—until July. This will have the additional advantage of making it possible to include in the issue complete annual reviews of the results from all the mines, as by then the last of the postponed annual meetings of Rand companies will have taken place. Those contributors who had not yet sent in their promised articles will note that the delay gives them the desired time to apply the finishing touches to their work. In case we have overlooked acknowledging receipt of any articles sent in, we take this opportunity of thanking their contributors.

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1. The **TRANSVAAL** is producing over one-third of the World's Gold Output.
2. **TRANSVAAL** Mines have spent 24 millions sterling on machinery and plant
3. The **"South African Mining Journal"** is the **Official Organ** of the **Mine Managers' Association.**

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Automobile Notes.

The Dust Season.

With a pardonable foreboding the South African Motorist views the advent of the dusty season, a time when motoring is stripped of much of the attractiveness which invariably attaches to the pursuit at all other seasons of the year.

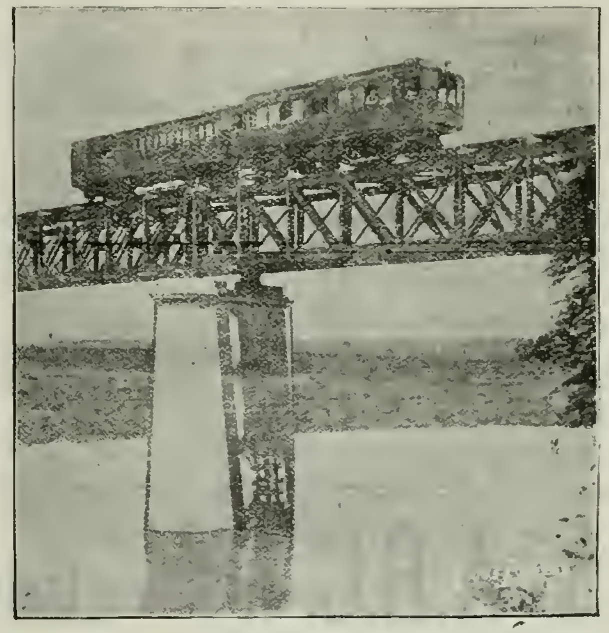
Many experiments have been resorted to in order to combat the dust nuisance, some meeting with a measure of success, but, generally speaking, the remedy is still far to seek. True, a solution of this vexed question, to a partial extent, is found in some of the coast towns, where the municipalities have hit upon the ingenious and novel plan of sprinkling the streets with sea water, the saline qualities forming a surface constation which effectively lays the dust on the roads so treated. The idea, while having much to recommend it, may appear at first sight, more or less impracticable in these parts, but a suggestion to treat some of the main thoroughfares of Johannesburg, by way of an experiment, with water to which salt is added, is given to the Municipality for what it is worth. The treatment of road surfaces with tar has been approved in many parts by the Dust and Dustless Roads Committee, and has also been tried in Johannesburg and other South African towns with most gratifying results. Surface tarring, with a view to laying dust, should be more widely adopted in these parts, especially during what may be termed the dry season, for the simple reason that an absence of rains—which characterises this period of the South African year—favours this particular process. This fact is borne out by road-tarring experiments carried out in the neighbourhood of London last autumn, which proved a failure, however, owing to the exceptionally wet winter. Scarcely a trace of the tar remaining, at the close of the season, on roads so treated. Reliable data, the Home journals point out, has, therefore, been supplied as regards different road preparations likely to give the best results under extreme conditions, such as those which characterised last winter, but which tar treatment, however, failed to establish.

The Traffic Problem.

As any means by which the pressure of congested traffic can be relieved is welcomed, the opinions of the Commissioner of London Police on this question may be deserving of recognition by the local authorities. While considering the protection of the public from dangerous driving as of paramount importance, he strongly deprecates the artificial restriction of the free circulation of traffic at busy centres; in fact he recommends pushing vehicles through as quickly as possible, and, in consequence, London police frequently signal to motorists to get on more quickly. Although Johannesburg traffic falls far short in volume when comparisons are attempted with large European cities, at the same time its unique character demands a special control, although a marked inability in this direction is often exhibited in those entrusted with this duty. While recognising the many efficient pointsmen who control the traffic at busy streets intersections, one cannot but refer to the ambiguous nature of many police signals given to motorists and others which only too clearly justify the foregoing view.

A New Rail Car.

The photograph here reproduced is of a rail car of 120-h.p., crossing the Vaal River at Vereeniging.



On an Official Test for the S.A. Railways.

The results showed a ton mileage per gallon of 228, at an average speed of 33 miles per hour, which is considered a record. The altitude being some 5,700 feet above sea level, speaks volumes for the efficiency of the Clandel-Hobson carburetter with which the car is fitted. This type of rail car and tender, by the Thomas Transmission Co., and Leyland Motors, Ltd., it is understood, has a great future in South Africa, and motor trains will, in time, appreciably relieve the much-criticised passenger train service obtaining at present.

Union Day Competition.

The competition for the Continental Tyre Trophy, which many expected would have been held on Union Day, has unavoidably been postponed to a later date, when it is hoped that the first contest for this beautiful trophy will be characterised by an entry gratifying alike to the donors and the T.A.C., under whose auspices the event is being carried out.

"Castrol."

C. C. Wakefield and Co., manufacturers of the famous "Castrol" motor oil, invite the attention of all motorists to the many important successes, at Home and abroad, achieved in motor car and motor cycle contests by competitors using their oil. In the "Brooklands" Championships recently, by way of illustration, three wins out of three events, in the opening Motor Cycle Race Meeting, were credited to users of "Castrol," a truly wonderful record, which no motorist can afford to disregard. In South African competitions, similar results seem to attend riders who favour this lubricant for their machines. To quote one: In the West Rand M.C.C. Mulder's Drift Hill Climbing Competition, users of Wakefield oils scored 1st in standard class, 1st, 2nd and fastest time in the T.T. class, and 1st and fastest time in side-car class. The manufacturer's contention, therefore, in regard to the suitability of these oils for South African conditions is clearly upheld.

Chamber Car.

The Irish commercial capital being so intimately associated with the building of liners and other vessels, in addition to being the centre of the great linen industry, it may come as a surprise to many to learn that it produces a very high-grade motor car, namely, the "Chambers"; in fact, it is the only Irish manufactured car, and is, therefore, interesting. Two models of the "Chambers" are made, a 12-16 h.p. and an 11-15 h.p., the smaller model having a bore and stroke of 80 x 102, and the larger 86 x 102. Chamber's Motors, Ltd., the manufacturers, have specialised in these machines for some eight years, and turn out an exceptionally high-grade car, which is in great demand, particularly with the Irish gentry. If Belfast workmanship in point of shipbuilding is to be accepted as a general criterion, then the Chamber's car, which, with the exception of the cutting of the gears, is exclusively Irish, must be a very dependable machine indeed.

The Glen Rosa mine, Selukwe, the property of Messrs. Lister and Mackintosh, started crushing on the 1st inst. with a Tremain. Results are said so far to be very satisfactory.

Satisfactory developments are reported from the Blucher mine, in the Rennie Taylour Concessions, which is being developed by the Exploring Lands and Minerals Company.

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New Patents.

255. George Henry Frederick Brazier.—An improvement in devices for hydraulic classification and the like.
256. Frederick Walter Baynes and Malcomess & Company, Limited.—Improvements in pumps.
257. James Wilson.—A new method of utilising waste small coal and unconsumed combustible remaining in engine ashes by means of making them into briquettes by the addition of organic binders or inorganic binders.
258. John Shanks.—An improved sanitary cap.
259. Bertram Robert Hester.—New method of extraction of precious stones and metals from their foreign particles.
260. William James Barnett and John Mitchell Lafayette Henry.—Improvements in spray devices for purifying mine air.
261. Leslie Stewart Muir.—Improvements in hose and pipe systems for distributing air to rock drilling machines and the like.
262. Thomas Bradshaw and Thomas Alexander Dryden.—Safety apparatus for truck haulage systems.
263. Charles Arthur Coles and Johannes Wilhelmus Eykelenboom.—Dust collector for rock drills.
264. Andre Leon Felicien Levy Strauss.—Improvements in torches suitable for igniting fuses.
265. Bernhard Behr.—An adjustable holder for candles, haberdashery, etc.
266. Noah Victor Hybinette.—Improvements in the electrolysis of metal salt solutions.
267. Frank Humphreys.—Improvements in the construction and use of surveyor's tapes.
268. Charles Friederich Eduard Oscar Schmidt.—Improvements in feeding means for tubular and like grinding mills.

South African Railways. The following statement shows for the month of April, 1912, the approximate tonnage and percentage of commercial seaborne traffic from the different ports to stations within the competitive zone, i.e., Vereeniging—Pretoria, Springs—Klerksdorp inclusive, and including the South Rand and Vereeniging—Canada Junction lines.

	Tonnage.			Percentage.		
Traffic.	Cape Ports.	Port Natal.	Lourenco Marques.	Cape Ports.	Port Natal.	Lourenco Marques
Group I.						
Rate 1 ... ... Rate 2 ... ... Rate 3	4,450	10,884	13,300	15·54	38·01	46·45
Group II.						
Rate 4 ... ... Rate 5 ... ... Rate 6 ... ... Rate 7 ... ... Rates 8 and 13 ...	1,092	1,880	9,722	8·60	14·81	76·59
Total	5,542	12,764	23,022	13·41	30·88	55·71

The Week's Company Meetings.

ROSE DEEP.

Marked Improvement.

Combating Miners' Phthisis.

The adjourned annual meeting of shareholders of the Rose Deep Limited, was held last week in the Corner House, Mr. H. Eckstein presiding. There were present Messrs. E. A. Wallers, S. Evans, A. G. Gill, J. H. Ryan, J. L. Jourdan, M. Honnet, J. N. Webb, F. Boerckel, S. M. Nelson, J. W. Webb, F. H. Barry, H. McCormick, and S. C. Steil (Secretary), representing 347,202 shares out of an issue of 700,000.

The Chairman's Speech.

The Chairman said: The annual meeting which had been convened for the 7th of March, has been adjourned to this date, in order to give every shareholder, whether he be residing in this country or abroad, ample time to study the reports and accounts which we have now met to consider, and which cover the twelve months ended the 31st of December, 1911. It is desirable that equal facilities for perusal of the reports should be given in future without thereby unduly delaying the date of the meeting. The company's articles of association will have to be altered so as to extend the time which may elapse between the date of the meeting and that at which the accounts are made up. It is proposed to arrange for the annual meeting to take place in future towards the latter part of May, which is the most convenient and at the same time the earliest possible date.

Marked Improvement.

Before dealing with the results of last year's operations, I would like to refer to the address delivered at the last annual meeting by Mr. W. R. Schumacher, which, as you may recollect, was characterised by a decidedly hopeful tone, and I am glad to say that the cheerful view which he then took of the prospects of the mine is borne out by the marked improvement in the results achieved during the year under review. The net profit earned of £342,832 compares favourably with the figure of £317,752 for 1910. This is the more gratifying, as the yield which in 1910 was, if anything, rather above the average grade of the mine, has during the past year come down to the more normal return of 27s. 11d. per ton. Even this figure may appear a little high, but it must be remembered that sorting has been increased from 13.8 to 15.6 per cent., which naturally improves the mill grade. But for the fact that, during the greater portion of the year, the mine was handicapped by shortage of native labour, there is no doubt that still better results would have been obtained. The tonnage milled, amounting to 695,000 tons, exceeds that of the previous year by 38,600 tons, and working costs at 17s. 11d. show a decrease of 11d. per ton. While the dividend has been maintained at the previous rate of 40 per cent., a sum of £50,499 was appropriated out of profits on account of capital expenditure amounting to £81,055. The net liability at the close of the year, after allowing for the gold reserve of £25,700 on hand, was £4,856.

Gold Reserves.

In this connection, I might refer to the fact which has already been brought to your notice, namely, that it has been decided to abolish the gold reserve altogether, and the aforesaid amount was made the subject of a special declaration in March of this year. The gold mining companies had established these gold reserves chiefly for the purpose of adjusting fluctuations in the grade of the ore mined, by either adding to or withdrawing from the amount held in reserve as the case might be, and thus enabling more or less regular monthly profits to be declared. The view has, however, been expressed in many quarters lately that it would be preferable to declare the profit which has actually been earned each month. Moreover, the Government has decided to disregard the gold reserve accounts entirely and to ask for a return of actual profits earned, and the Transvaal Chamber of Mines also arranged to issue similar returns. Under the circumstances, it seemed best to do away with the gold reserve and to face such fluctuations in the monthly profits as are unavoidable in a mining venture. Reverting for a moment to the accounts, the amount appropriated during the year out of profits in respect of capital expenditure is short of the sum actually spent under this head by £30,556. Liquidation of this item, and of such further small balances as remained unspent as at the 31st of December last on account of authorised votes, will not present must difficulty, as the declared gold reserve of £25,700 will, of course, be available in profit and loss account in addition to current profits. I will now deal with some of the more important features of the operations of the company during the past year, and I will also go back a little further and attempt to reconcile present results with those foreshadowed at the time of the amalgamation of the old Rose Deep and Glen Deep companies.

Satisfactory Value.

The development work accomplished during the year resulted in 729,000 payable tons, value 6.4 dwts. being disclosed. The footage and tonnage is somewhat lower than that effected in 1910, but the value is satisfactory. On comparing the total payable ore reserves as at the end of the last two years respectively, an increase is shown of 116,686 tons, the value being practically the same. In the consulting engineer's report the payable ore reserves, which amount to the large total of 3,670,160 tons, have been segregated under various headings with a view of showing the relative proportions that are available or accessible for stoping. It might be explained that in the total ore reserves all the ore is included which has been sufficiently exposed by development to enable an estimate of its value being made. It does not necessarily follow that all such ore is immediately fully available for stoping, but it will be seen that only a small portion cannot be readily attacked.

It is interesting to know that the long looked-for increase in the company's labour force which took place during the latter part of the year was almost immediately followed by an appreciable rise in the profits, the last quarter averaging just under £35,000 actual profit per month, as against £28,600 average for the preceding three months. I am glad to be able to state that the mine is still fairly well supplied with labour, and that the tropical natives, of whom we have a considerable number, appear to be doing well. The regulations which have been laid down for the comfort and welfare of this particular class of natives have been most carefully carried out by those responsible for their due observance. It is gratifying to know that the death rate at the Rose Deep has been little over one-half of the average rate of all the gold mines.

Twelve Months' Work.

Every effort is being made to expedite the extraction of the largest possible quantity of ore from the upper levels of the north section of the Rose Deep mine, so as to avoid losing any appreciable portion through caving. Work in this section has, however, to be carried on with great care and cannot proceed on a very large scale. About 120,000 tons were mined from these workings during 1911, and with some luck the management hopes to go on at about the same rate for several years to come. A more extended use has been made of machine drills, which will tend to minimise the inconvenience occasioned in times of labour scarcity. Experiments made with hammer drills have given much promise of success, especially where used for taking up footwall, and, in the event of labour becoming again less plentiful, it is hoped that these drills will prove a satisfactory substitute for hand labour, one machine worked by one boy doing the work of five hammer boys. A reference to the consulting engineer's and manager's reports will show that various important schemes, all tending to effect concentration and working economies, have been completed, such a centralisation of pumping, surface connection between the Glen and Rose mills, and a connecting haulage underground between No. 3 and No. 4 sharts. A number of small main rope haulages are now at work in the slopes, and this has resulted in the saving of a good many boys. Shaft sinking is completed with the exception of a few feet at No. 4 shaft.

Electrification.

The electrification of the plant is practically completed, but the supply of a sufficient quantity of electricity and compressed air by the Rand Mines Power Supply Company is still delayed. We appreciate the initial difficulties attending any vast undertaking of this nature, and I think the power company fully realise the importance of carrying out their obligations. Our claims for actual loss sustained owing to delays which were not beyond their control have been duly recognised, and we have every reason to believe that such further plant as is required in order to ensure a sufficient supply will be this year. The installation of two electrically driven fans has much improved the ventilation of the mine, but it is readily admitted that ventilation is only one of several measures which have to be adopted as an effective means of improving the working conditions, and consequently the efficiency of underground work, and of checking the incidence of that dreadful disease miners' phthisis. The efforts of your management, in common with others, are directed towards the problem of killing not only the dust created by drilling, which is already being done with a considerable measure of success, but also of laying the dust caused by blasting. Indications are not wanting that some effectual remedy will have been found before long, so that the current of air which artificial ventilation passes through the workings will only contain such infinitesimal quantities of dust as will do no harm to the underground worker whether he be white or black. It is only fair to state that not until comparatively recently has it been realised how large a proportion of workers have, in the course of time, been affected by this dreadful disease, and I have no doubt that, now the seriousness of it has been brought home to everybody, the mines and the men themselves, will not rest till they have worked out their own salvation. As this is a matter which affects the welfare of the whole community, and to a very large extent the prosperity of the whole Union of South Africa, it is surely not too much to ask that all concerned, namely, the mines, the men, and the State, should be prepared to take on their shoulders a share of the burden which it is proposed to impose by legislation for the benefit of the sufferers and their families.

Problems Multiplying.

You will have gathered from the various points on which I have just touched that, as the mining industry expands, so the problems with which it is confronted multiply, and many of the schemes which are now occupying our attention, and which almost invariably involve considerable expenditure, were not thought of a few years ago. This explains to a great extent the discrepancy between the results obtained by the enlarged company and those forecasted at the time of the amalgamation of the old Rose Deep and the Glen Deep. The difference lies in working costs, and in the fact that the amount of profits available for distribution had to be curtailed to meet certain requirements on capital account which were not contemplated when the consulting engineers worked out the figures contained in their report of August, 1909. Full details of such expenditure were given in the manager's reports for 1910 and 1911, and the total of the two years amounted to the large figure of £161,671, all but £30,000 of which has been appropriated out of profits. We are now in a more comfortable position in this respect, in that practically all the outstanding votes have been closed. The management is straining every nerve to reduce working costs below the average of the second half of last year, i.e., 17s. 8d. per ton, which is nearly 2s. higher than the figure estimated for the first year after amalgamation, but many factors militate against the attainment of these estimates, some of which I have already dealt with; others are: increased cost of recruiting, increased native wages, increased cost of feeding the natives, and, lastly, the effect of several provisions in the new mining regluations, principally that limiting the working hours underground to eight hours per shift. The plant is now working at its full capacity, and the record tonnage of 65,200 was milled in March of this year. If we can maintain a monthly tonnage crushed of well above 60,000, I hope that we shall see some slight reduction of working costs, notwithstanding the difficulties I have pointed out. Of the authorised votes for capital expenditure only £1,676 remained to be spent at the end of last month, and, as far as we can see to-day, no further expenditure will need to be contemplated for some time to come. The average profit of the first four months of this year is nearly £7,000 per month in excess of that obtained over the same period last year. There is no need for me to emphasise the significance of these figures.

Smooth Running.

Our quarterly reports have been amplified a little, and I think they now contain in a concise form all such information as is of interest, including the financial position. This should enable shareholders to form a fairly accurate idea in regard to the amount which is likely to be available for dividend purposes. Gentlemen, I propose to follow the advice given to the chairmen at a recent meeting of the Central Mining and Investment Corporation, Limited, in London, namely not to be too eager to make forecasts so as to avoid being hauled over the coals and disappointing shareholders in the event of unforeseen circumstances preventing the fulfilment of promises which have been made in the best of faith. I can safely say, however, that at the present moment things are running very smoothly, and that the prospects of a successful year are most encouraging. It might interest you to learn that the management is steadily carrying on work in the Rose section with a view of gaining further knowledge of bodies of main reef and south reef, which have not been thoroughly prospected. Indications encourage the belief that a quantity of payable ore will be found to exist which has not been considered in the calculation of the life of the mine, which was estimated in December, 1909, at rather more than thirteen years. The board gladly acknowledge the good work done by the manager, Mr. A. J. Walton, who has been ably assisted by his staff. The advice of the consulting engineer, Mr. W. T. Anderson, who has resigned to take up an important appointment on the East Rand Proprietary Mines, will be much missed, and I should like to take this opportunity of wishing him every success in his new career. Mr. Robert Raine is acting as his successor. I now beg to move the adoption of the reports and accounts for the year ended the 31st of December, 1911.

The report and accounts were adopted.

Messrs H. C. Boyd and E. A. Wallers were re-elected directors.

Messrs. C. L. Andersson and Co. and Messrs. F. W. Diamond and English were reappointed auditors.

WITWATERSRAND CO.

Improved Returns.

The New Shaft.

A Question of Grade.

The annual meeting of shareholders of the Witwatersrand Gold Mining Company was held at noon on the 29th May.

The Chairman's Speech.

In moving the adoption of the reports and accounts, the chairman, Mr. J. Munro, said: For your consideration, I beg to submit the directors' report, together with the audited balance sheet and accounts for the year ended 31st December, 1911, as well as the reports of your consulting engineer and mine manager which cover the same period.

Sale of Claims.

A block of 26.3256 claims which is so situated that it would be impossible for this company to economically work, was sold during the year to the Simmer and Jack East, and the purchase price amounting to £13,162 17s. has been written off property account. In the early part of the year the monthly profits were not so satisfactory as we had reason to expect, but since July there has been a steady and considerable improvement. The ore crushed was 10,169 tons less than in 1910. There was a decrease in the yield of 1s. 6d. per ton, and an increase of 7d. per ton in working costs, which accounts for the decrease of about £46,000 in profits as compared with 1910.

Profits.

The profit from all sources amounts to £173,692 12s. 1d., out of which, after providing for depreciation, profits tax, and sundry small disbursements, two dividends of 17½ per cent. each, absorbing £148,750 were declared.

New Shaft.

At the end of the year the vertical shaft in the southern section of the property had attained a depth of 944 feet, and the northern incline shaft, which is to intersect the vertical shaft, to a depth on the incline of 772½ feet below the main cross cut on the 12th level. The permanent equipment of the vertical shaft was well advanced at the end of the year, and a railway siding from Delmore Station constructed. Capital expenditure on this section of the property during the year amounted to £96,043 15s. As is our custom, the payable ore reserves were re-calculated at the end of the year, and are estimated at 1,225,084 tons of a recovery value of 5.65 dwts. You will notice from the consulting engineer's report that a large quantity of low-grade main reef and bastard which may prove payable has not been included in this calculation.

Current Year's Returns Improve.

Since the close of 1911 there has been a marked improvement in the returns from the mine. This is clearly indicated by the monthly profits for the first four months of this year. For January the total gross profit was £15,845; February, £15,575; March, £17,512; and April, £18,581. These figures are most encouraging, and we have every reason to hope that a still further improvement will be effected. The above results have been accomplished by mining rock of a grade more in keeping with the average grade of the mine. This policy has entailed an increase in working costs, but it has been justified by results. It is now recognised that low working costs are not always synonymous with the best economic results. Low working costs very often mean the mining of too large a percentage of wide reef of poor grade, and this tendency should be avoided as much as possible. A considerable influx of natives took place in the early part of the current year, and this has enabled the mine to increase the scale of development operations. Very encouraging results have been obtained, especially at the top of the southern section, where most of the driving has been carried on. Steady progress has been made with shaft sinking, and at the end of April the vertical shaft had attained a total depth of 1,389 feet, and the northern incline shaft a depth of 944 feet.

It was originally intended to hold the annual general meeting of the company at the usual time, viz., the end of March, but in order to meet the wishes of European shareholders it was postponed to this date. The reports and accounts were circulated, here and in London, about the end of March, an arrangement which gave sufficient time to shareholders on the other side to make representations if they wished to do so at this meeting.

A special general meeting will be held at the close of this meeting to make such alterations in this company's articles of association as to enable the annual meeting to be held at a date which will give European shareholders ample time to consider the reports and accounts prior to the meeting.

In July last Mr. W. M. Prout resigned the management of your property, and Mr. F. B. Lewis was appointed in his place. I now beg to move the adoption of the directors' report and accounts.

Mr. Llewellyn Edwards seconded the motion. He remarked that it must be gratifying to note the appreciable improvement which had taken place in the returns. The results were due to the great care and assiduous attention which the directors had devoted to the control and management of the property. The work of the directors had been in every way in the highest interests of the shareholders.

Mr. F. W. Baxter asked when it was anticipated to strike the reef in the vertical shaft.

The Chairman replied that the shaft was a pioneer shaft in that district, and it was difficult to say when the reef would be struck. The directors however, anticipated that the reef would be struck at a depth of about three thousand feet.

The report and accounts were adopted.

Messrs. S. B. Joel and H. Nourse were re-elected directors

Messrs. Stuart and F. W. Diamond were reappointed auditors.

The special general meeting to pass alterations in the Articles of Association, indicated by the chairman in the interests of the European shareholders was adjourned for a week because there was not the necessary quorum present.

NEW PRIMROSE.

Increased Dividend Justified.

At the annual meeting of shareholders of the New Primrose G.M. Company,

The Chairman, in moving the adoption of the reports and accounts, said: It gives me pleasure to place before you the directors' report and accounts for the financial year ended 31st December, 1911. As usual, you will find the fullest information in regard to the working and results for the twelve months under review in the reports of your consulting engineer and mine manager which are printed with the directors' report.

Operations and Profit.

During the year the mill crushed 281,648 tons of ore, an increase of 24,480 tons as compared with 1910. The total profit for the year was £217,658 5s. 6d., to which has to be added the balance of £42,034 3s. 7d. brought forward from 31st December, 1910, thus showing a credit to appropriation account of £259,692 9s. 1d. After providing for profits tax, depreciation and sundry disbursements your directors were in a position to pay two dividends of 20 per cent. each during the year, and to shareholders registered on the 30th December an additional distribution of 30 per cent. in the form of a bonus. I may here be permitted to inform shareholders the circumstances under which the policy of paying bonuses in addition to regular dividends was adopted. The result of the operations for the year 1904 justified an increased dividend, but the directors considered it advisable to conserve some of the company's funds in order to equalise dividends in future years, as it was then thought that the year's profit was above the normal profit earning capacity of the mine. The result of subsequent working, however, demonstrated that with careful management the high standard could not only be maintained, but substantially increased. At the end of 1906 the directors therefore decided that in addition to the half-yearly dividends a bonus should be paid to shareholders. Since then bonuses have been paid annually in addition to regular dividends, and the distribution made at the end of the year under review completes an amount equivalent to the issued capital of the company.

Dividend Record.

Dividends amounting to 662½ per cent. have been paid since the formation of the company, which, together with the bonuses above referred to, make a total distribution of 762½ per cent., or £7 12s. 6d. per share. Profits will in future be distributed solely in the form of dividends. You will see from the consulting engineer's report that it was considered advisable during the year to close down the May Deep shaft, as the ore from this portion of the property can now be more economically worked from the shaft on the adjoining section.

Ore Reserves.

According to our custom, the ore reserves were re-estimated at the end of the financial year, and now stand at 423,311 milling tons of an estimated recovery value of 6.7 dwts. It would be as well to mention that this figure does not include a large tonnage of reef which is available in the old workings, as it is difficult to estimate the amount and value of this rock.

The Current Year.

Having dealt with last year's accounts, it will interest you to receive some information regarding the current year's operations. The results obtained continue to be most gratifying, and a profit of £68,000 was made during the first four months of the current year. Of course the mine has now reached a stage when considerable fluctuations in grade may occur, and it cannot be expected that the present high level of profits will be maintained for an indefinite period. On the other hand, the further the re-investigation of the older parts of the mine is proceeded with, the more it becomes apparent that large quantities of ore were left undisturbed at the period when the mine was first worked. Though some of the ore left behind was at that time considered to be of too poor a grade to be mined, it is entitled in these days to be classed as valuable reef, besides which areas of high grade ore have been discovered, and will add considerably both to the life and the profit earning capability of the New Primrose. It was originally intended to hold the annual general meeting of the company at the usual time, viz., the end of March, but in order to meet the wishes of European shareholders it was postponed to this date. The reports and accounts were circulated, here and in London, about the end of March, an arrangement which gave sufficient time to shareholders on the other side to make representations if they wished to do so at his meeting.

A special general meeting will be held at the close of this meeting to make such alterations in this company's articles of association as to enable the annual meeting to be held at a date which will give European shareholders ample time to consider the reports and accounts prior to the meeting.

On the 31st of July, Mr. R. Clarkson, who had managed your property since the previous September, resigned his position, and Mr. J. L. van Eyssen was appointed in his stead. I now beg to move the adoption of the reports and accounts.

The report and accounts were adopted.

Mr. G. Imroth's appointment as a director in place of the late Mr. Harold F. Strange was confirmed, and the retiring directors. Messrs. G. Imroth and Charles Marx, were re-elected.

Messrs. J. P. O'Reilly and F. W. Diamond were reappointed auditors.

A special meeting was to have taken place subsequently to make the alteration in the articles indicated by the Chairman in the interests of European shareholders, but as there was not a quorum this meeting was adjourned for a week at the same time and place.

GINSBERG G. M. COMPANY.

Improved Profits.

At the seventeenth ordinary general meeting of shareholders of the Ginsberg Gold Mining Company, Mr. J. Munro presiding.

The Chairman, in moving the adoption of the reports and accounts, said: I beg to submit for your consideration the directors' report and accounts for the year ended 31st December, 1911. In the reports of your consulting engineer and mine manager for the period under review full information is contained as to the year's operations. The tonnage crushed was slightly lower than that for the previous year, but the extraction shows a considerable improvement.

Appropriation of Profit.

A profit of £59,344 8s. 2d. was made on the year's working, which, added to the amount of £23,975 19s. 1d. carried forward from last year, gives an available amount of £83,320 7s. 3d. Two dividends were declared during the year, namely on the 30th of June, 10 per cent., and on the 30th of December, 15 per cent., which absorbed £52,500, and, after allowing for profits tax, depreciation and sundry small disbursements, the balance carried forward to next year is £22,394 17s. 11d.

Ore Reserves.

The ore reserves were re-estimated at the end of the financial year, and amounted to 367,646 tons of an estimated recovery vaue of 6.8 dwts. These figures show an increase both in quantity and quality as compared with last year. The installation of a tube mill, mentioned in my remarks last year, was completed about November, 1911, and the results obtained therefrom are quite satisfactory. During the year it was decided to carry out certain important repairs to the Ginsberg shaft, which were of such a nature that it necessitated the shaft being closed down for a period of five months. Arrangements were made for keeping the mill fully supplied with ore from the northern section of the property, and the profits realised during this period were in no way diminished. You will notice from the consulting engineer's report that it was ascertained during the year that the position at which the north reef is cut off by the East Rand Dyke is farther to the south than was formerly expected. This is a most important factor, as it will add a considerable reef area to that previously calculated on.

The Current Year.

For the first four months of 1912 the total gross profit amounted to £24,508, giving a monthly average of £6,127. This is a considerable improvement on the average profit realised during 1911, and I believe that we are justified in anticipating that this improvement will be maintained for some time to come. During the last four months the mine has had the full benefit of the tube mill, and with the aid of this plant it has been found possible to increase the tonnage milled and to improve the extraction. In addition to this the native labour supply has been sufficient for our requirements, and all stoping is being carried out by hand. This has reduced the amount of waste rock stoped and the grade has benefited accordingly. On the whole the mine looks very promising at the present time. Very little driving has been done for some months past, but the sinking of the north shaft has been resumed, and the development of that portion of the reef still to be opened up to the north of the East Rand dyke will be proceeded with as rapidly as possible. It was originally intended to hold the annual general meeting of the company at the usual time, viz., the end of March, but, in order to meet the wishes of European shareholders, it was postponed to this date. The reports and accounts were circulated here and in London about the end of March, an arrangement which gave sufficient time to the shareholders on the other side to make representations if they wished to do so at this meeting. A special general meeting will be held at the close of this meeting to make such alterations in this company's articles of association as to enable the annual meeting to be held at a date which will give European shareholders ample time to consider the reports and accounts prior to the meeting. I now beg to move the adoption of the reports and accounts.

The report and accounts were adopted.

The appointment of Mr. Gustav Imroth as a director in place of the late Mr. Harold F. Strange was confirmed, and Messrs. John Munro and G. Imroth, retiring directors, were re-elected.

Messrs. Henry Hains and J. P. O'Reilly were reappointed auditors.

At the special general meeting which followed alterations were made in the articles of association to enable the annual meeting to be held at a date which will give European shareholders ample time to consider the reports and accounts prior to the meeting.

NEW RIETFONTEIN CO.

The Dyke Puzzle.

Reduced Costs.

Increased Reserves.

The annual meetings of shareholders of companies of the Barnato group of gold mines were held on the 29th May in the Board-room, Consolidated Buildings, Mr. J. Munro presiding. The first meeting held was that of the New Rietfontein Estate Gold Mines, Ltd.

The Chairman, in moving the adoption of the report and accounts, said: I have much pleasure in placing before you the directors' report and accounts for the year ended 31st December, 1911, together with the reports of the consulting engineer and mine manager for the same period. As the technical reports go so fully into the details of the year's operations I need only draw your attention in general terms to the more important items of the year's work.

Reduced Working Costs.

A feature of the year's operations, and one I am convinced you will appreciate, is the substantial reduction of 5.839s. per ton in the working costs. For this reduction, which has enabled us to treat at an increased profit ore of an average value of 3s. below that crushed during 1910, you are indebted to the energy of your manager, Mr. F. Graham Bell. The working profit for last year was £39,349 4s. 6d., against £15,625 14s. 6d. earned in the previous year, to this must be added estate revenue, rents, etc., which realised £5,537 5s. 5d., and these amounts together with the balance of £4,224 14s. 3d. carried forward from last year give a sum of £49,111 4s. 2d. to be dealt with. After providing for profits tax and several small standing charges your directors were in a position to declare a dividend of 5 per cent. at the end of the year, which absorbed £30,504 4s., leaving a balance of £8,031 3s. 1d. to be carried forward to the current year's account.

Unsuccessful Boring.

Boring operations were carried on to a considerable extent during the year, but I regret to say that we have not yet succeeded in locating the reef to the south of the dyke, of which I made mention at last year's annual meeting. While watching developments in the district your directors have decided for the present entirely to devote their attention to opening up the large reef-bearing area above the dyke, which is equal to 248 claims, and of these 58 are still untouched. At the present time development is practically confined to the vicinity of No. 1 shaft and the 12th level is being driven on, but until this shaft has been sunk some distance further, and the nature and value of the reef ascertained at depth, it is impossible to say how this section of the mine will turn out.

Two Years Ore Reserves.

It should be borne in mind that we have ore reserves in sight equal to two years' milling, and that in addition to these reserves a large tonnage is still available for reclamation work. The ore reserves, as usual, were recalculated at the end of the year and show an increase of 19,705 tons, the average assay value remaining practically the same as that for the previous year. It was originally intended to hold the annual general meeting of the company at the usual time, viz., the end of March, but in order to meet the wishes of European shareholders it was postponed to this date. The reports and accounts were circulated here and in London about the end of March, an arrangement which gave sufficient time to shareholders on the other side to make representations if they wished to do so at this meeting. A special general meeting will be held at the close of this meeting to make such alterations in this company's articles of association as to enable the annual meeting to be held at a date which will give European shareholders ample time to consider the reports and accounts prior to the meeting. You will notice from the directors' report that it will be necessary to confirm the appointment of Mr. Gustav Imroth as a director in place of the late Mr. Harold F. Strange. Mr. Strange had been a director of your company since its inception, and always took the keenest interest in its affairs. It was therefore with great regret that your board received the sad news of his death in July, 1911. I now beg to move the adoption of the reports and accounts.

The report and accounts were adopted.

The meeting confirmed the appointment of Mr. Gustav Imroth as a director in place of the late Mr. Harold F. Strange, and re-elected Messrs. J. Munro, S. B. Joel, H. A. Rogers, J. Friedlander, E. Brayshaw, C. Marx and G. Imroth, retiring directors.

Messrs. Thomas Douglas and Henry Hains were reappointed auditors.

At the special general meeting which followed resolutions were passed altering the articles of association to enable the annual meeting to be held at a date which will give European shareholders ample time to consider the reports and accounts prior to the meeting.

DURBAN ROODEPOORT.

Shafts Repaired.

Main Reef Stopes.

Good Year Looked For.

The fifteenth annual meeting of the shareholders of the Durban Roodepoort Deep, Limited, was held on May 29th at the Corner House, Mr. E. A. Wallers presiding. There were present Messrs. H. Eckstein, J. Jourdan, H. C. Boyd, J. H. Ryan, M. Honnet, E. Renaud, S. C. Steil, F. H. Barry and H. J. McCormick, representing 256,244 shares out of an issue of 440,000.

The Chairman, in moving the adoption of the report and accounts, said: The reports and accounts for last year have been in your hands for some time, and shareholders have therefore had the opportunity of carefully considering the very complete statements of the consulting engineer and manager which have been presented. Our object in having postponed this meeting until today, and in intending to hold annual meetings at a similar time of the year in future is, as you know, to give shareholders ample time to study the full account of the year's operations that is always put before them in the annual reports, and further, to enable them to send us any suggestions and criticism that are, in their opinion, called for by their consideration of the facts in their possession, so that we may deal with any of these points at the annual meeting. I think you will agree that a consideration of the details of last year's work impresses us first with the fact that exceedingly difficult mining problems were unfortunately met with, particularly in local crushing of ground at Nos. 2 and 3 shafts, and were successfully overcome.

Underground Troubles.

The movement of ground at No. 2 shaft was the most serious difficulty, and hauling at that shaft had to be suspended from May to the end of August. This, as you will realise, affected our profits very considerably, because in addition to the serious interference thus caused to our hoisting operations, the pump columns in the shaft were naturally affected by the pressure of ground and there were, consequently, stoppages of our pumping plant and flooding of the lower levels of the mine. And then, of course, the fact that all the repair work to shafts and pumping plant had to be paid for also seriously affected the profits for the period I have referred to. However, as I have just said, these troubles were successfully overcome; and the next, and encouraging points that will have appealed to you in the consideration of your affairs are that, notwithstanding the decrease of your profits to approximately £2,400 per month for four months out of the year, the total net profit for the twelve months amounted to £58,959.

Increased Ore Reserves.

And, further, in spite of the fact that the serious troubles I have referred to naturally seriously hindered development operations underground, the total footage for the year shows an increase over the previous year of 3,296 feet and the consequent increase in our payable reserves amounts to 226,000 tons of the same average value as the ore that was already standing in reserve. Your total payable reserves are dealt with in full detail in the consulting engineer's report, and I will not refer further to them beyond drawing your attention to the fact that your position in this respect has been very satisfactorily strengthened.

Working Costs.

As regards the general mining operations for the year there are a few features which I think should be noted with satisfaction. The working costs show a reduction of 3d. per ton for the year. This does not sound very much, but it means a good deal when it is remembered that the heavy abnormal costs in the shaft repair work, etc., that I have dealt with, were borne by working costs. And then there is the fact that the proportion of main reef mined and the proportion developed have been appreciably increased. This perhaps requires a little further explanation. As you are aware, the consistent gold carrier in your mine is the south reef, and very consistent in payable value it has proved to be over practically the whole of your mine so far developed. It is, however, a narrow reef and, as we have told you from time to time, essentially a reef that requires hand labour for satisfactory and efficient working. You have, in addition, the main reef, which is more erratic in its value, but is a satisfactory profit-earner in a fair proportion and has the added advantage of being suitable for machine drilling work. There is, therefore, distinct benefit in having developed an increased proportion of payable main reef, because the supply of hand labour for the south reef is, unfortunately, always fluctuating, and when we are short of hand labour boys we can put machines into our payable main reef blocks. I need not labour the point to enable you to see clearly that to have such main reef blocks in reserve is of great benefit to us at times when we are short of natives, and enables us at least to keep our tonnage up reasonably well, though the reef is not of so high a value as is the south reef. Our labour supply has been but moderately good throughout the year, and at no time have we had sufficient hand labour natives to procure tonnage sufficient to keep the mill running at its full capacity of 25,000 tons per month.

Capital Expenditure.

The expenditure on capital account which had to be provided out of profits during the year was considerable, as you will have seen. Out of a net profit of £58,959 we were only able to distribute one dividend of 5 per cent., which absorbed £22,000, the payment of profits tax to the Government accounted for £5,522, and the remaining balance of profit, amounting to £31,437, was appropriated towards the £36,247 spent on capital expenditure during the period under review. This heavy outlay that we have had to face during the last two years has been a very distinct drain on your profits, and has naturally very adversely affected the distributions that have been possible, and has, I am afraid, tried the patience of shareholders. The expenditure last year was mainly in connection with the electrification of the plant, and that is now completed and working very satisfactorily. It is due to the two new electrically driven compressors, which form part of our electrification scheme, that the development footage and results for last year were so satisfactory. The only remaining important item of capital expenditure is now the centralisation of the pumping plant and the concentration of all water in the mine to the bottom of No. 1 shaft. This work is being carried out now, and I think we can safely say that we can see the end of these heavy drains on profits that in future should be more fully available for distribution to shareholders. This centralisation of pumping is work that must be done and will pay us handsomely for doing, as you will have seen from the consulting engineer's reference to the subject. Our pumping costs to-day average approximately £1,900 per month, and our engineers advise us with confidence that the new plant will handle all the water very much more effectively than the present scattered pumping plants, and at a cost of under £1,000 per month, assuming that the volume of water to be handled does not increase materially beyond its present proportions. This work will cost approximately £20,000, but as I have just said we hope that we can see the end of these large appropriations from profits that have been reinvested in the undertaking during the last two years, in the purchase of claims, the electrification of the plant and this pumping plant.

Concentrating Underground Work.

You will have seen from the consulting engineer's report that we are making plans to lay out the 12th level across the property as a main concentrating and tramming level, and are generally endeavouring to improve underground conditions, having always in mind the necessity of concentration of work and of reducing the number of unskilled labourers employed by means of labour-saving devices. With this end in view, also, the management has been carefully testing the use of small machines in our narrower south reef stopes, but it is too soon yet to give expression to any definite views on the subject. To sum up the position, gentlemen, we hope to see an increased distribution to shareholders this year as compared with last year, barring any unforeseen accident, and at the same time steadily to liquidate the existing liability of which the temporary financing presents no difficulty. The development of your mine continues to reflect values which, as you will have noticed, are quite satisfactory, and I think the general position of the mine and plant entitles us to look for a successful year's work. In conclusion, I have pleasure in placing on record the board's high appreciation of the services of the consulting engineer, Mr. P. Cazalet, the manager, Mr. A. P. Rouillard, and the staffs at the mine and head office during a very strenuous and more than usually difficult year's work. I now beg to move the adoption of the report and accounts for the year ended 31st December, 1911.

The report and accounts were adopted

Messrs. E. A Wallers and H. C. Boyd were re-elected directors.

Messrs. J. P. O'Reilly and E. Danckwerts were reappointed auditors.

ROBINSON G. M. CO.

Honourable Old Age.

Mining Difficulties.

The Life Problem.

The twenty-second annual general meeting of shareholders in the Robinson G.M. Company, Ltd., was held on the 29th May. There were present Messrs. E. A. Wallers, chairman, C. Meintjes, H. Eckstein, Comte F. de Ferrieres, H. C. Boyd, M. Dold, J. Jourdan, and S. C. Steil, secretary. There were represented 29,941 shares out of the total issue of 550,000 of £5 shares.

The directors' report and the statement of accounts were submitted and the report of the auditors read.

The chairman, in moving the adoption of the report and accounts, said: Owing to the later date at which we are holding this meeting, shareholders have had some considerable time in which to study the very complete reports and accounts dealing with the operations of last year. There is one outstanding feature in this company that I am sure all have realised, and that is that our mine, in its exceedingly honourable and profitable old age, is naturally not getting easier in its working conditions. The blocks of ore remaining in the mine, particularly in our rich reefs—the south reef and the main reef leader—are, of necessity, getting more and more scattered. and therefore no real concentration of work is possible but, instead, the number of working faces at which operations are being conducted steadily increases, the distance to be travelled is greater, and the cost of the supervision of the work and the shovelling and transport of the ore is also more costly. And then, too, our increasing age means that the problem of supporting the ever enlarging areas of excavated ground becomes more pressing for attention at our hands, which you will have gathered it is receiving in the sands filling work that is proceeding and which got more into its swing during the latter half of last year. This year a still more marked progress has been made, and we expect very shortly to be lowering over 50,000 tons of sands monthly into the workings.

Safety and Working Costs.

These points I have referred to are responsible to a considerable extent for the fact that the working costs for last year show an increase of 2s. 6d. per ton when compared with the previous year. Another factor that has had its influence on working costs is found in the record of the development work, which shows a large increase over the previous year and is, of course, necessary to block out the 5.3 claims of which the undermining rights were acquired from Government. However, I think you will agree that, taking into consideration the various mining difficulties which are inseparable from a mine like the Robinson, the results for last year can be regarded as distinctly satisfactory; and it will be advisable here to refer briefly to the financial results of the year's work that are presented in the accounts in your possession.

Better Grade.

The working costs, as I have just said, show an increase of 2s. 6d. per ton, but the grade also shows an increase of 3s. 11d. per ton, and therefore the resultant profit per ton has an advantage of 1s. 5d. over last year's figures. This increase in grade is due to the fact that a rather smaller percentage of main reef was milled during 1911 than the previous year and, consequently, a somewhat increased percentage milled of the richer south reef. The total tonnage milled, at 592,700, shows a decrease of 46,200 tons when compared with 1910, and it is a curious fact that your mine, which has practically always had a fairly adequate supply of good voluntary natives, suffered a good deal in that respect last year, especially in regard to natives for shovelling and tramming. The profit per ton, as you will have gathered from the figures I have just quoted, shows an increase of 1s. 5d., but in view of the smaller tonnage treated the total working profit realised amounted to £911,308, as compared with £936,756 for the previous year.

Accounts.

To this figure of £911,000 must be added the interest on investments and sundry revenue which, after allowing for various donations, etc., amounted to £17,937, and we get a total of £929,245, carried to appropriation account. Two dividends, one of 15 per cent. and one of 12½ per cent. absorbed £756,250, the Government received in profits tax the substantial sum of £84,410, the amount spent on capital account was £46,153, and the amount paid to Government in respect of the undermining rights was £58,220. We thus carry forward to this year the sum of £260,100—an exceedingly sound financial position, gentlemen, I feel sure you will agree, and one which I think very thoroughly bears out my description of our company as enjoying an honourable and distinctly profitable old age.

Capital Expenditure.

The details of the expenditure on capital account you will have observed in your consideration of the manager's report. The major portion of the expense was incurred in connection with the installation of the Butters Filter plant, which cost £31,000. This is a large sum of money, but the plant, which commenced operations in September last, has been a great success, and I have no hesitation in saying that, though costly, it will prove a good investment for us. The development work for the year, as I remarked earlier in my address, shows a considerable increase, and I would add here that the values disclosed by the work in the new ground acquired from the Government are, as was anticipated, quite to our satisfaction.

Profits and Life.

And now as to the position and prospects for the current year. We have had letters from a few shareholders desiring information as to the life of the mine, what the profits will be and why they have decreased somewhat of late. I think you will agree that it would be extremely unwise of me, and unfair to the shareholders concerned, to attempt to give detailed answers which, in the very nature of things, cannot be regarded as final. I have tried to show some of the difficulties which are attendant on the working of a mine like yours, and I shall now give the details of the ore resrves, and indicate to you the policy on which we propose to work during the current year.

Of the rich reefs, viz., the south reef and main reef leader, it is estimated that we have blocked out a total of 1,221,661 tons of an average value of 11.4 dwts., calculated on a stope width of 73 inches. In addition, we consider we should recover from old workings, pillars, etc., on these reefs a further 305,000 tons, the value of which it is obviously impossible to state definitely, but that certainly should not be less than 11.4 dwts. This gives us a total of over 1½ million tons of very high grade rock. As regards the main reef, it is more difficult to give definite figures, but we think that on a conservative basis we have available on this reef 1,307,000 tons of a value of 4.2 dwts. In addition, there is probably quite 500,000 tons of main reef worth about 3 dwts. that may have some profit in it for us in the future. However, at the present time we have, approximately, 2,800,000 tons on all three reefs in the proportions and of the estimated values that I have given you, and this is exclusive of tonnage on the rich reefs still remaining to be blocked out in the ground acquired from Government and estimated at roughly 400,000 tons. As you will have seen from the manager's report, there is a very considerable decrease shown in the payable main reef reserves, when compared with last year's figures. Blocks considered payable last year have proved unpayable in stoping, caving has taken place, and in order to make for safe working conditions some main reef has been covered up by sand-filling, working costs are higher, and therefore the pay limit of the reef has consequently to be increased and certain blocks eliminated from the payable reserves. These are the reasons which account for the decrease in the tonnage of reserves, and you will have realised that, in any case, the margin of profit in the working of this reef is small.

Present Policy.

As to the policy to be pursued during the current year, I would say at once that the object we have in view is to obtain the greatest possible monthly profit consistent with safe working. It is clear to you, I take it, from what we have said, that with the conditions that are inseparable from age, it is necessary to watch things very carefully and modify from time to time, in certain directions, the methods of working. The capacity of your plant enables the treatment of 55,000 tons per month, and if it were possible to fill the plant every month with this tonnage from your rich reefs, and at the same time keep the mine safe, it would be well to do so. We cannot do this, however, because, as I have tried to explain, the blocks of south reef and main reef leader are becoming steadily more isolated and scattered. We have therefore set ourselves to increase the percentage of payable main reef mined, to endeavour to increase the tonnage milled to 55,000 tons per month (the full capacity of the plant) to increase the sands sent down the mine to over 50,000 tons per month, and last but not least, to try to reduce working costs, so that the main reef, which to-day presents but a small margin of profit, shall produce better profits. That is the task, gentlemen, or rather the series of tasks, and they are not easy. We cannot command success, but we have the best reasons to have confidence in our management, and we know the best will be done towards the attainment of these objects.

Mr. W. T. Anderson, who rendered valuable services to this company as consulting engineer, has recently taken up the important position of general manager to the East Rand Proprietary Mines, where I feel sure he will further add to an already very successful career. Mr. P. Cazalet succeeds Mr. Anderson as your consulting engineer. I should like, also, to express the board's keen appreciation of the work of Mr. Selby, your manager, and his staff. Mr. Selby, who resigned his position about two months ago, to take up the management of the Geldenhuis Deep, vigerously and effectively faced and overcame many difficult problems during the year, and to him and his men under him our thanks are largely due for the excellent results achieved. Mr. Palmer Carter, formerly manager of the Ferreira G.M. Co., has been appointed manager in place of Mr. Selby. I beg to move the adoption of the report and accounts for the year ended the 31st of December, 1911.

Mr. Jourdan seconded the motion, which was carried unanimously.

The appointments of Mr. S. Evans and Mr. E. G. Renaud as directors were confirmed, and Messrs. R. W. Schumacher and E. G. Renaud, the retiring directors, were re-elected.

Messrs. C. L. Andersson and Co. and H. J. Macrae were reappointed auditors, and their remuneration for the past audit was fixed at two hundred guineas each.

Special Meeting Adjourned.

The special meeting called to make an alteration in the articles of associatio in regard to the directorate was, owing to the absence of the necessary quorum, adjourned to next Wednesday at 10.45 a.m.

GLENCAIRN MAIN REEF.

Future Prospects Indicated.

The Life Question.

Low Accident Rate.

The nineteenth ordinary general meeting of shareholders of the Glencairn Main Reef Gold Mining Company was held on May 29th in the Board-room, Consolidated Buildings, Mr. J. Munro presiding.

The Chairman, in moving the adoption of the report and accounts, said: I beg to submit for your approval the report of the directors and accounts for the twelve months ended 31st December, 1911, to which are attached the reports of the consulting engineer and mine manager, in which full details are given as to the working and results of the operations for the year under review. The value of the ore milled and the cost of treatment were practically the same as in the previous year, but the ore sent to the mill was less by 21,533 tons. A greater quantity of accumulated slime was however treated, and the result of the year's operations shows a small increase over the profit of 1910.

Profits Distribution.

The year's profit from all sources amounts to £29,035 14s. 11d., out of which, after providing for profits tax and sundry small disbursements, a dividend of 5 per cent., absorbing £27,500, was paid. Several blocks of reef-bearing ground, which were estimated as being within the pay limit when calculating the ore reserves at the end of 1910, have been found to be of lower grade than anticipated, and have therefore been eliminated from your consultin gengineer's estimate of ore developed at 31st December, 1911, which is calculated at 925,000 tons of an average recovery value of 3.5 dwts. per ton.

No Mine Plans.

At last annual meeting of shareholders it was suggested that a plan of the mine workings should be attached to this year's annual report. The suggestion has had the careful consideration of your directors, but it was felt that such a plan would tend to mislead shareholders as to the prospects and life of the mine rather than afford information. In this connection I would point out that of the ore now being sent to the mill a large proportion is reclaimed from stopes in the old workings, which was unpayable under the conditions prevailing in the early history of the company. Shareholders will observe that the margin of profit per ton is very small, and the greatest attention has to be given to working costs and payability of the ore milled. So many factors enter into the question that it is impossible to give even an approximate forecast of the life of the mine, but unless we are saddled with undue burdens, the company should continue to pay small dividends for some years to come.

Dangerous Mining: Few Accidents.

Though the work of reclaiming ore from old stopes is admittedly dangerous, it is gratifying to be able to report that fatal accidents to native labourers were considerably below the average of the Rand, and that not a single fatal accident to a white employe occurred during the year under review. This reflects great credit on the management and all concerned in the working of the mine. The total gross profit for the first four months of 1912 amounted to £10,579, and it is hoped that the profit will be maintained at about this level for a considerable time, though fluctuations cannot always be avoided. It was originally intended to hold the annual general meeting of the company at the usual time, viz., the end of March, but in order to meet the wishes of European shareholders it was postponed to this date. The reports and accounts were circulated here and in London about the end of March, an arrangement which gave sufficient time to shareholders on the other side to make representations if they wished to do so at this meeting.

A special general meeting will be held at the close of this meeting to make such alterations in this company's articles of association as to enable the annual meeting to be held at a date which will give European shareholders ample time to consider the reports and accounts prior to the meeting. Towards the close of the financial year Mr. G. G. Holmes, who had been manager of your property since November, 1910, resigned his position and Mr. T. C. Bruce, who had previously acted as manager of the mine, was appointed in his stead. I now beg to move the adoption of the reports and accounts.

The report and accounts were adopted.

The meeting confirmed the appointment of Mr. Gustav Imroth as a director in place of the late Mr. Harold Strange, and Messrs. Imroth and John Munro, retiring directors, were re-elected.

Messrs. Henry Hains and J. P. O'Reilly were reappointed auditors.

There was no quorum for the special meeting to alter the articles of association and this meeting was adjourned for a week.

GOVERNMENT AREAS.

Progress of Shaft Sinking.

Approaching the Reef.

A Successful District.

The second ordinary general meeting of shareholders of the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd., was held in the Board-room, Consolidated Buildings, at three o'clock on May 29th, Mr. J. Munro presiding.

The Chairman, in moving the adoption of the report and accounts, said: It gives me pleasure to submit to you the directors' report and balance sheet for the period ended the 31st of December, 1911, as well as the reports of your consulting engineer and mine manager covering the same period. Sinking operations were continued throughout the period under review, and the footages attained at the end of the year were as follows: North-east shaft, 1,420 feet; north-west shaft, 1,609 feet; south-east shaft, 1,388 feet; and south-west shaft, 477 feet.

Shaft Sinking and Labour.

In the latter shaft sinking had to be stopped early in the year, as the native labour force at our disposal then was not sufficient for all purposes, but towards the end of August we managed to obtain an adequate supply, and we were in a position to resume sinking operations in the south-west shaft, which have continued ever since at an excellent rate. Since I last had the pleasure of addressing you the permanent hoisting plants at all the shafts have been completed, quarters for the white employes have been erected, as well as the native compounds, and boarding-houses for the white men on the property. The construction of a system of railway sidings connecting the shafts and stores with the main line of the South African Railways was also undertaken. From the tabular statement accompanying the manager's report you will see that the average cost of shaft sinking was in the neighbourhood of £30 per foot, which includes the cost of sinking, timbering, pumping and baling. It will interest you to know the progress which has been made on your property, and I shall briefly deal with the work done since the 31st of December last. The sinking of all four shafts is proceeding steadily, and the rate of progress all round has been satisfactory. The footage accomplished during the four months ended the 30th of April, 1912, was as follows:

	Feet Sunk.	Total depth at 30/4/12.
North east shaft ..	475	1,895ft.
North-west shaft ..	584	2,193ft.
South-east shaft ..	794	2,182ft.
South-west shaft ..	666	1,143ft.

Record Progress.

It will be seen that the most rapid progress was made in the south-east shaft. Here we achieved a record for vertical shaft sinking in March, when the footage for one month totalled 233 feet. Interest at the moment is centred in the north-west shaft, which is nearer the reef horizon than either of the other shafts. The present depth of the shaft is some 2,300 feet, and it was hoped that the reef would be reached in the neighbourhood of this depth. However, as you are aware, there were no boreholes on the property, and such data as was available was at points a considerable distance away. It now appears probable that another 200 or 300 feet will have to be sunk before the reef is encountered. Our technical advisers have gone very carefully into the lay-out of the mine, and once the reef has been reached no time will be lost in starting development. With regard to the scheme on which development operations will be conducted, it is proposed to adopt a modification of colliery practice, as the low angle of dip in this section of the Rand renders the usual method of development on these fields too tedious and costly. The railway siding to the two southern shafts has been completed, and coal is now being delivered to these shafts in bulk.

Surrounding Properties.

When addressing you last year I mentioned that your property was surrounded by mines which had been crushing for some time, and by several others which were about to enter the crushing stage. Of those that have been actively producing the Modderfontein Gold Mining Company continues its successful career, giving excellent results. The Geduld Proprietary Mines, I understand, is showing considerable improvement, the development in the lower levels giving most satisfactory values over milling width. The Modderfontein B and the Brakpan Mines have commenced reduction operations since last we met, both with satisfactory results. The Modderfontein B gives good returns and handsome profits, and the Brakpan Mines is showing most consistent values, with profits which are on an ever-increasing scale, and I have it on the best authority that the development is exposing ore of a most satisfactory nature. Judging from the successful operations of your neighbours, I have no hesitation in saying that we can reasonably expect an equally successful future for your company. It was originally intended to hold the annual general meeting of the company at the usual time, viz., the end of March, but, in order to meet the wishes of European shareholders, it was postponed to this date. The reports and accounts were circulated here and in London about the end of March, an arrangement which gave sufficient time to shareholders on the other side to make representations if they wished to do

A special general meeting will be held at the close of this meeting to make such alterations in this company's articles of association as to enable the annual meeting to be held at a date which will give European shareholders ample time to consider the reports and accounts prior to the meeting.

Towards the end of March last year your then manager, Mr. T. C. Bruce, resigned his appointment, and your board with the advice of Mr. J. G. Lawn, your consulting engineer, appointed Mr. M. H. Coombe to that position. Mr. Coombe came to us with an excellent reputation and a long experience in shaft-sinking work, and the results obtained under his management amply justify your board's selection. I now beg to move the adoption of the reports and balance sheet as submitted to you.

Mr. G. Imroth, in seconding the motion, said he felt that the sinking operations had now reached that stage when naturally shareholders would ask when the reef was to be struck. The chairman had told them that they were in hopes that by now the directors would have been able to give them that information. But they had to ask shareholders to exercise a little more patience. He had every reason to think that it would not be for long. They all hoped that when they did get the reef they would strike it good. In view of the very successful results shown by three immediate neighbours, that hope was a very reasonable one. The area was an enormous one of over two thousand six hundred claims. The whole of the capital of one million four hundred thousand pounds was represented by the same amount in cash, and he was sure shareholders would agree with him that they had every reason to look forward with confidence that the company would prove one of the most important gold producers on these fields.

The report and accounts were adopted.

Mr. Charles Marx, retiring director, was re-elected.

Messrs. Thos. Douglas and Ernst Danckwerts were reappointed auditors.

At the special general meeting which followed, the articles of association were altered, as indicated by the chairman, in the interests of European shareholders.

Mr. G. Imroth took the opportunity to point out that, in spite of the facilities given to European shareholders to be represented at the meeting, and though there had been eight meetings of companies of this group to-day, scarcely a single European shareholder had been represented. Might he assume that that apparent apathy was due to the fact that the European shareholders were so satisfied with the management of the companies that they did not consider it necessary to be represented?

VAN RYN DEEP LIMITED.

The Late Reconstruction.

A Promising Area.

Satisfactory Development.

The seventh annual general meeting of shareholders of the Van Ryn Deep, Ltd., was held on 29th May at 2.30 o'clock, in the board-room, Consolidated buildings. Mr. Munro presided and there were also present Messrs. W. Dalrymple, G. Imroth, C. Marx, W. H. Dawe, G. R. Airth, F. W. Baxter, J. A. Cohen, J. H. Ryan, J. F. Rutherford, P. Richardson, and C. A. O. Bain.

In moving the adoption of the report and accounts, the chairman said: The directors' report, together with the balance sheet for the year ended the 31st of December, 1911, as well as the report of your consulting engineer and mine manager, are now submitted for your consideration. The development carried out during the year under review was in the main accomplished from the west shaft and the results obtained were of a most encouraging nature. In some portions of the levels, ore of poor grade was found, but in other areas high grade has been encountered, making the average value of the ore reserves very satisfactory. The tonnage of ore developed at the end of the year was 603,716 tons of an estimated value of 7.17 dwts.

Development.

Since the end of the year the east shaft has been sunk to the sixth level, and three levels are now being driven to the south of the big downthrow fault which was met with in this shaft. The fourth and fifth levels are being carried out eastwards into a section of ground of which practically nothing is known, and the reef so far explored shows gratifying values; at the sixth level a cross-cut is being driven to the reef. Better values have recently been met with in the first level west from the west shaft and also in the third level west. The sinking of the west shaft has now been resumed. It seems probable that the effect of the downthrow fault, which proved such a serious hindrance to development in the east shaft, will not be so marked in the west shaft. On the whole the development of the mine is opening up a considerable tonnage of ore of satisfactory grade and it is expected that about one million and a half tons of payable reserves will be available by the time the reduction works are ready to start.

Equip

The design of the equipment is now making considerable headway, and a start will be made at the beginning of next month with the excavations for the foundation of the mill. The reduction works will be on a basis of 40,000 tons per month, and it is expected that the plant will be ready to start in some twelve months' time. The results achieved by the mines in the neighbourhood such as the Kleinfontein, Van Ryn and Modderfontein, who are old producers, and by some others which have commenced milling during the last year, have been very gratifying. The Brakpan Mines, for instance, is on the immediate dip of your property and the reduction operations of that mine have been watched by us with great interest. Their development drives are almost up to your southern boundary showing excellent values and the profits made by them are increasing in volume month by month.

Finances.

Towards the end of last year the cash resources of your company became virtually exhausted and your board approached the largest shareholders with a view of putting the affairs of your concern on a satisfactory financial basis. An offer was received from them, declaring themselves ready to provide the necessary working capital to fully develop your mine and to equip the same with an up-to-date plant.

Reconstruction.

This offer necessitated the reconstruction of your company by reducing the capital from £1,496,114 to £598,446 and the provision of £598,446 of cash raising the total capital to £1.196.892. This proposal was provisionally accepted by your board and a special general meeting, which was called by them for the purpose, confirmed the acceptance of the offer. The new 598,446 shares were offered to shareholders at 21s. per share and were guaranteed at that figure, subject to a commission of 1s. per share, with the result that the guarantors had to take up practically the whole of the issue. As the necessary certificate from the Registrar of Companies was not obtained until after the end of your financial year, the consequent entries could not appear in the accounts submitted to you. The whole of the reserve shares in the old company, including 126,943 shares over which an option was held, were, with the consent of the option holders, cancelled under the reconstruction scheme. It was originally intended to hold the annual meeting of the company at the usual time, viz., the end of March, but in order to meet the wishes of European shareholders it was postponed to this date. The reports and accounts were circulated, here and in London, about the end of March, an arrangement which gave sufficient time to shareholders on the other side to make representations if they wished to do so at this meeting. A special general meeting will be held at the close of this meeting to make such alteration in this company's articles of association as to enable the annual meeting to be held at a date which will give European shareholders ample time to consider the reports and accounts prior to the meeting.

At the last annual meeting a shareholder raised the question whether a meeting of shareholders could not take place in London after the meetings here had been held. Your board has given this question very full consideration and they have come to the conclusion that such a course would be impracticable. As they have taken steps to give shareholders in Europe ample time in future to be represented at the annual meetings, I do not think there is any necessity for me to say any more about it. I now beg to move the adoption of the reports and accounts.

Mr. W. Dalrymple, in seconding the motion, said: Taking into consideration the fact that the eastern section of your property has not so far been opened up to any extent, I think we must consider the ore reserves and average value as they stand at present quite satisfactory, and hold out every reasonable expectation for the future of your company as a gold producer. It will be seen that the eastern section so far is disturbed and faulted, and this is also the experience of your neighbour on the outcrop, viz., the New Kleinfontein Company. These dislocations naturally entail a considerable increase in mining expenses; however, the grade of the ore is found to be of high value, which much more than compensates for the increase in cost. I think it will be generally admitted that the mining area of the Modderfontein, the Van Ryn, and New Kleinfontein Company constitutes a gold-bearing area in the matter of average value second to none on the Witwatersrand fields, and everything points to the fact that this gold impregnation should gradually be opened up on your property; hence your managament can prosecute their development work in an easterly direction with every reasonable confidence. Going west, the reefs in your property conformable with the outcrop, though of good widths and regular and under easy mining conditions, are of a poorer grade; however, at the same time the Apex Company, adjoining your western boundary, have in the course of their developments opened up ore from the commercial aspect of quite satisfactory value. Gentlemen, I think we can look forward with every confidence to the point when gold production can be commenced. Now that the finances have been arranged to enable your company to reach the producing stage with a 40,000 ton reduction unit, and given that the delivery of machinery will be up to time, your company should inaugurate its career in as auspicious a manner as your neighbour, the Brakpan Mines.

The report and accounts were adopted.

The meeting confirmed the appointment of Mr. Gustav Imroth and Mr. J. H. Ryan as directors in the places of the late Mr. Harold Strange and Sir Abe Bailey, resigned

The retiring directors, Messrs William Dalrymple and Charles Marx, were re-elected.

Messrs. Alex Aiken and Henry Hains were reappointed auditors.

At the special general meeting, which followed, the resolutions indicated by the chairman, were passed, the interests of the European shareholders.

GELDENHUIS DEEP.

Active Development.

The Milling Capacity.

A Transition Stage.

The seventeenth annual meeting of shareholders in the Geldenhuis Deep, Limited, was held on May 29 in the Corner House, Mr. H. Eckstein presiding. There were present: The Comte de Ferrieres, Messrs E. A. Wallers, R. M. Connolly, S. C. Steil, F. H. Barry, H. J. McCormick, J. E. Allington, C. Meintjes, M. Honnet, H. P. Rogers, H. Neuhaus, and S. M. Nelson, representing 361,298 shares out of an issue of 585,578.

The Chairman said: An adjournment of the annual meeting, which had been convened for the 8th of March, was decided on in order to give shareholders resident outside South Africa every opportunity of studying the reports and accounts whch cover the twelve months ended the 31st of December, 1911. The board is desirous of affording equal facilities for perusual of the reports in the future, and an alteration of the company's articles of association will be proposed at an early date, the object being to extend the period which may elapse between the date of the meeting and that at which the accounts are made up. Our annual meeting will, therefore, take place in future towards the latter part of May, which is the most convenient and also the earliest possible date.

Results of Operations.

The results of the company's operations during the year under review are not as satisfactory as we would wish them to be. We also have to consider the fact that the profits earned during the first quarter of this year are lower than those obtained during any three months of last year, though April has, I am glad to say, shown up much better. Turning first to the accounts, a net profit of £232,611 is shown, as against £268,118 for 1910. An unappropriated balance of £114,411 was brought forward from last year. Capital expenditure on equipment and property, as fully detailed in the reports, amounted to £96,549, and profits tax to £18,121. These two items, totalling £114,670, are, as you will see, practically balanced by the amount left over from last year. The amount carried to the balance sheet at the 31st of December, 1911, viz., £56,625, therefore represents very closely the difference between the profit of £232,611 and the dividends paid during the year, which absorbed £175,725. Adding to this unappropriated balance of £56,625 the gold reserve of £6,627, the financial position shows a credit of £63,253. If we exclude all assets other than cash, Government stocks and gold in transit, the actual cash position shows a liability of £3,066. An item of £22,836 appearing on both sides of the balance sheet represents the sum total of the annuities agreed on with the Government as the consideration payable in respect of undermining rights granted to us under certain water-rights and bewaarplaatsen, 17.1866 claims in extent, on the western boundary of our property. Payment has been arranged in twelve yearly instalments of £1,903 each, and it will be seen from the accounts that the first instalment has been paid and charged to appropriation account, in reduction of the amount for which the Government figures as a creditor in the company's books. The terms arranged with the Government are considered satisfactory. Work has already commenced in this area and there is every reason to believe that it will prove a desirable acquisition.

Some Comparisons.

I will now comment on the results of last year's operations, which are dealt with in detail in the reports before you. A comparison with the results of the previous year's working and with some of the figures put before shareholders prior to the amalgamation of the old Geldenhuis Deep, Jumpers Deep and Geldenhuis Estate Companies, may be of interest. I shall also refer briefly to the results obtained during the first few months of the year. Compared with 1910, the tonnage crushed shows a decrease of 24,750 tons. The shortfall, though regrettable, is not serious, and it can hardly be contended that the profits for the year have suffered to any appreciable extent on this account. The yield of 27s. 9d is down 3d. per ton, which is equivalent to £10,000 per annum. I might add that the payable ore reserves, which at the end of 1910 had an estimated value of 6.1 dwts., are calculated to give a yield of about 29s. per ton, that is with 20 per cent. sorting and an extraction of 95 per cent. The explanation of the apparently low yield obtained from the tonnage mined last year is that only 60.4 per cent. came from payable ore reserves, and that the value of the ore making up the remaining 39.6 per cent. was considerably below that of the payable reserves I wish we could eliminate the whole of this lower grade ore, but this is not practicable. The proportion of ore mined from reserves is, however, capable of being improved on and increased attention is now being given to the matter of reducing the quantity of development rock going to the mill and mining a smaller proportion from such sources, other than payable ore reserves, as can be conveniently left untouched. During the first three months of this year the actual yield has gone up to 28s. 2d. per ton, which is no doubt largely due to the fact that the proportion of ore mined from payable reserves has been brought up to 74 per cent., as against 60.4 per cent. for 1911. This is decidedly a satisfactory feature. Unfortunately, working costs have been going up steadily—they were 21s. 11d. in 1910, 22s. 1d. in 1911, and during the first quarter of this year 24s. 1d. per ton. The last named figure includes a development charge of 2s. 5d. per ton, and this charge has since been further raised, i.e., to 3s. 6d., which is the estimated approximate cost, based on recent results, of replacing each ton mined by a payable ton developed. Let me add that this item of development provision will be revised from time to time and that, in fixing it at 3s. 6d. as from the first of this month, I think we have, if anything, erred on the right side.

Working Costs Tackled.

You will be glad to know that Mr. Selby, who took over the management of the mine about three months ago, is satisfied that the present figure of working costs is excessive, and he is now concentrating his attention on this most important point. It is being tackled in a thorough and systematic manner, and I feel confident that we shall see a gradual improvement in this direction. I think some explanation is due to shareholders of the discrepancy between the data put before them in 1909 and the figures I have quoted to-day. The results which were then foreshadowed were based on such general conditions as obtained in July, 1909. It was estimated at that time that the company would be in a position to crush at the rate of 917,000 tons per annum, that the yield would be 24s. 10½d., and working costs 18s. 9d. per ton. In his report for 1910 the consulting engineer drew your attention to the difficulties met with in trying to carry out the idea of milling on this scale, owing to the expected supply of native labour not being forthcoming. There is the further fact, to which I shall refer later, that during 1911 we have effected a much bigger development footage than that contemplated three years ago, which has interfered with mining operations to some extent. Working costs of 18s. 9d., which were based on the larger tonnage, were naturally impossible of attainment with the smaller scale of operations; labour has become less efficient and more costly; such items as sandfilling and renewals of plant have been particularly heavy of late; costs have been affected by narrower stoping and closer sorting, which has, of course, tended to increase the yield and latterly several provisions in the new Mining Regulations, principally that limiting underground work to eight hours per shift, have added to our working expenditure. The yield is about 3s. per ton higher than the 1909 figure of 24s. 10½d. This is explained by the necessity of raising the pay limit of the mine, owing to the higher working costs. At the end of last year (1911) the estimated value of the payable ore reserves was 6.2 dwts., whereas the yield of 24s. 10½d. was based on a mine grade of 5½ dwts. and on a smaller percentage of sorting and extraction than that shown in the results for 1911.

Circumstances beyond Control.

I think you will agree that an investigation of these various points clearly shows that the failure to attain the contemplated scale of operations, and the consequent difficulty of earning the profits which were anticipated, are due to circumstances which could not have been foreseen and which were beyond our control. In January of this year it was decided to close down the north plant, thus limiting, for the time being, the monthly tonnage to the capacity of the east and west reduction plants, viz., 60,000 tons. Needless to say the north plant will be kept in good repair so as to be ready for use in the event of circumstances favouring the resumption of milling operations on a larger scale. Our decision to shut this plant down was prompted by two reasons: (1) The three plants could only be run efficiently and economically if working at their full capacity. The quantity of ore coming from the north section is gradually diminishing, and it was estimated that the tonnage likely to be supplied by the whole mine in the near future would be less than 70,000 mill tons per month. By running two plants to their full capacity it was calculated that 60,000 tons would yield practically the same profit as would be obtained, when crushing and treating 70,000 tons, under less economical conditions. (2) It became evident some time ago that development would have to be pushed more vigorously and that the footage effected during the early part of 1911, viz., about 1,700 feet per month would have to be nearly doubled if a serious drop in the ore reserves were to be avoided. It was also considered desirable to increase the number of available stope faces, so as to be able to work a larger proportion on single shift, and improve the efficiency, which unfortunately has been very poor on this mine. The management was, therefore, instructed to increase the footage to not less than 3,000 per month, and for the last seven months of the year the monthly average was 3,112 feet. The carrying out of this policy, which is of vital importance, and which will have to be pursued unremittingly, naturally absorbed a large proportion of the available labour force, and stoping operations had to be curtailed to some extent in consequence thereof. Under the circumstances, the closing down of the north plant was undoubtedly the proper course to adopt.

Payable Ore.

Of the total ore exposed by development operations for the year, 45 per cent., equal to 652,663 tons were payable, value 6.7 dwts. The low percentage of payability is disappointing, but the value of the payable tonnage is satisfactory. In the consulting engineer's report, the payable ore reserves, totalling 2,262,840 tons, value 6.2 dwts., as against 2,521,481 tons, value 6.1 dwts., at 31st December, 1910, have been split up under various headings. It will be seen that of the whole tonnage only a comparatively small proportion, viz., 332,115 tons, is unavailable at present; the remainder is either fully available or will be rendered available for stoping by current development and sandfilling. An extensive programme of sandfilling and packing is being carried on in the east section, all details having been arranged with the Government Mining Engineer. His requirements for the protection of the railway line passing over our property are being carried out with all possible care and despatch. Arrangements for sandfilling or packing in the west section are now being considered. The large total of 237,600 tons of sand has been lowered into the mine during the last fifteen months. The expenditure incurred in this connection has not been without benefit to the mine, in that sandfilling has facilitated the extraction of ore from the north section, and has generally steadied the country in the neighbourhood of No. 2 shaft. It is hoped that the erection of the stage hoist at No. 2 shaft, which has been completed recently, will enable No. 1 shaft being closed down by the end of the year. Our aim is to further concentrate in hoisting, as economies are bound to result from the shutting down of one or more of the six winding shafts we have at present.

Power Supply.

There has been a good deal of delay in the supply of electricity and compressed air by the Rand Mines Power Supply Company, but we have reason to believe that our full requirements will be met before the end of the year, which will benefit us in many ways. You have already been advised that the gold reserve was abolished in March of this year, and as the actual profit earned is now being declared, fluctuations in the monthly declarations will have to be faced. The details of the laying out of the Primrose Township have been settled and are awaiting final approval of the Townships Board. No time will be lost in proceeding with the scheme, once the necessary authority has been obtained. Shareholders will, I feel sure, not be slow in appreciating the fact that the quarterly reports have been amplified so as to give a very complete record of the company's position every three months. Only a very small portion of our programme of capital expenditure remains uncompleted, and a sum of £20,000 should be amply sufficient to cover the balance of the authorised votes which were still open as at 31st March, the principal items being: Underground winder for No. 3 shaft; new headgear for No. 2 shaft, and electrification of the plant.

Position Summed Up.

The whole position can be summed up in a few words: Owing to various reasons, which I have fully dealt with, the policy outlined some three years ago for the working of the mine has had to be modified in several respects. We are still in a state of transition, and, that being so, it would be unwise to venture any prediction at this juncture as to the immediate or future prospects. Working costs will certainly have an important bearing on future results, and I am confident that the management will not rest until a decided improvement can be shown in this direction. Your manager, Mr. H. Musson Thomas, having resigned in February of this year, Mr. Paul Selby, who has been very successful in the management of the Robinson Gold Mining Company, Ltd., was appointed in his stead. I now beg to move the adoption of the reports and accounts for the year ended 31st December, 1911.

The report and accounts were adopted.

Messrs. R. M. Connolly and M. G. Elkan were re-elected directors.

Messrs. C. L. Andersson and Co. and Messrs. Alex Aiken and Carter were re-appointed auditors.

CONSOLIDATED LANGLAAGTE.

The New Plant.

Excellent Equipment.

Starting Up Next Month.

At the ninth ordinary general meeting of shareholders of the Consolidated Langlaagte Mines, Limited, which was held on the 29th of May,

Chairman's Speech.

The Chairman, Mr. J. Munro, in moving the adoption of the report and accounts, said: I beg to submit for your consideration the directors' report and balance sheet for the year ended the 31st of December, 1911, as also the reports of your consulting engineer and mine manager for the same period. The only item in the balance sheet calling for special comment is that of £226,885 3s. 1d., appearing under the heading of "Amount transferred from Appropriation Account." This amount represents the actual expenditure incurred during the year on surface equipment, shaft sinking, and development in the southern section of your property, and will be dealt with in the general adjustment of accounts at the end of the current financial year. In commenting on the year's operations, it will be convenient to deal first with the figures relating to the outcrop mine, and thereafter refer to the work done on the southern section of the property.

Outcrop Mine.

There was a reduction of nearly 2s. per ton milled in working costs, notwithstanding the fact that 23,926 tons less ore were crushed than that treated in 1910, and as a consequence the total profit of £84,667 8s. was slightly in excess of the latter year's return.

The payable ore reserves in this portion of your property were calculated at the end of the year to be 397,017 tons of an estimated recovery value of 5.9 dwts. A considerable amount of development has yet to be done on the Star section, and there is every promise that a large tonnage of payable ore will be exposed as the work progresses. I may here mention that all development expenditure on the outcrop mine is charged to working costs.

Southern Section.

Your consulting engineer deals so fully with the scheme of equipment and the work accomplished at the end of the year on the large area comprising the southern section of your property that I propose only to refer to the work done since the close of the year. Excellent progress has been made with the new surface equipment, and it is anticipated that the whole of the machinery will be ready for a trial run within the next fortnight, and that we shall be ready to start crushing with the new mill by the beginning of July if power is available. In the designing of the new reduction plant our engineers have made use of the best information available as regards the latest Rand practice, and, while it includes nothing of an experimental nature, the plant will compare favourably from the point of view of efficiency with any on the fields.

Old Plant to Close Down.

It is our intention to close down the old mill on the outcrop section of the mine as soon as the new reduction works have been put in commission, and treat the ore from both sections with the new plant. The south mine continues to open up in a most satisfactory manner. It was decided about two months ago to reduce the scale of development operations, as we have now got ample ore reserves in sight to meet our requirements. The payable tonnage developed during the first four months of the year amounted to 170,103 tons, making a total at the end of April of about 1,400,000 tons. In addition to the driving, a large footage of winzing and rising was accomplished, as it is our intention to have everything in ship-shape order for stoping by the time the new mill is ready to run. Shaft sinking has not been neglected. The great advantage of keeping the shafts well ahead is thoroughly realised by our technical advisers, and sinking is still being carried on steadily. At the end of April the east shaft had attained a depth of 2.263 feet, and the west shaft a depth of 2.355 feet. I can assure you we look forward to the starting of the new plant with every confidence, and once the initial troubles incidental to all new plants have been overcome, we anticipate much higher profits and a bright future for the company.

Financial.

Now that we are about to emerge from our difficulties and, as I firmly believe, enter on an era of prosperity, the time is opportune briefly to review the financial position of the company. When the present scheme of equipment was formulated in September last, it was found that in addition to the loan of £250,000 guaranteed under the reconstruction scheme of 1908, a further amount of £250,000 would be required to complete it. The Johannesburg Consolidated Investment Company and Messrs. Barnato Bros. undertook to provide this further amount at the same rate of interest as the first mortgage debentures carried. The position to-day is that the debenture issue has been reduced to £75,000, and the amount borrowed from the Johannesburg Consolidated Investment Company and its partners in the loans, totals £371,000. There are still several large payments to be made in connection with the new equipment, but it is anticipated that the money available will be sufficient to meet all requirements. There is every probability that before the end of this year the option over the reserve shares will be exercised, and also that the thereafter remaining balance of the company's indebtedness is likely to be placed on a fixed footing, thus making the profits earned available for the payment of dividends. It was originally intended to hold the annual meeting of the company at the usual time, viz., at the end of March, but, in order to meet the wishes of European shareholders, it was postponed to this date. The reports and accounts were circulated here and in London about the end of March, an arrangement which gave sufficient time to shareholders on the other side to make representations if they wished to do so at this meeting.

A special general meeting will be held at the close of this meeting to make such alterations in this company's articles of association as to enable the annual meeting to be held at a date which will give European shareholders ample time to consider the reports and accounts prior to the meeting.

Under the supervision of your consulting engineer, Mr. A. E. Payne still continues as manager of your property. I now beg to move the adoption of the reports and accounts.

Mr. J. H. Ryan.

Mr. J. H. Ryan, in seconding the adoption of the report and accounts, said: After hearing the speech giving details as to the present position of the company, I rise with a view to congratulation rather than criticism on the position we have arrived at, as I think we are at last launched on what, I hope, will be a successful career. Many of us have been shareholders in the Consolidated Langlaagte since its early history, and though good profits have been earned the board has found it necessary to collar the profits and put them back into the development and equipment of the property. This policy I quite endorse, and hope we will now derive the benefit of such reinvestment. I notice from the appropriation account that no less a sum than £226,000 has been appropriated for shaft sinking and equipment, and that there is still a balance of £84.768, unappropriated, thus showing that our mine is capable of earning good profits. The directors inspected the new plant last week, and I, as one of them, cannot help being struck, with the fact—when comparing with other plants—that your new equipment has been carried out in a masterly fashion; no unnecessary luxuries seem to have been indulged in, yet everything possible in the direction of economy and efficiency seems to have been thought of, and your thanks are due to the manager and the engineering staff of the Johannesburg Consolidated Investment Company, who are responsible for this. The outcrop of your mine has in the past yielded good profits, and judging from the excellent developments of the southern section to date, we should do better when fairly at work with the new mill. Your consulting engineer reports that developments are carried on on both the south reef and main reef leader; the disclosures on the south reef being most satisfactory, and in those on the main reef leader, though rather more erratic, the percentage of payability is higher in the southern section than it was in the outcrop mine. To me it is very assuring to find that apart from the payable developed ore reserves in the outcrop mine, namely, 397,000 tons of 5.9 dwts., we have the excellent reserve of 1,222,000 tons valued at 8.2 dwts. in the southern section, more particularly when the consulting engineer reports that this is calculated over an average stoping width of 47 inches, as one must feel that with a decent width of stope, machine drills can be worked more extensively and to greater advantage, and thus assist in cheapening costs and making your work less affected by native labour fluctuations so detrimental to the regular feeding of a big mill, and the carrying out of an active development policy

In reply to a question the chairman stated that according to their contract they were entitled to receive power for the new works on the 1st of July. It was just possible it might be a little later before it was ready, but the report of the Power Company assured them that its technical advisers were of opinion that the company would get its power during July.

The reports and accounts were adopted.

The appointment of Mr. Gustav Imroth and of Mr. J. H. Ryan as directors in place of the late Mr. H. F. Strange and of Sir Abe Bailey, resigned, was confirmed. The retiring directors, Messrs. Ernst Danckwerts and John Munro, were re-elected.

Messrs. Henry Hains and Thomas Douglas were reappointed.

At a special general meeting which followed, the alterations in the articles indicated by the chairman, in the interests of European shareholders, were made.

BANTJES CONSOLIDATED.

Sound Reserve Position.

Improved Facilities.

First Declaration of Dividend.

The fifteenth annual meeting of the shareholders of the Bantjes Consolidated Mines, Ltd., was held on May 29th in the Corner House, Mr. E. A. Wallers presiding. There were present Messrs. G. Sonn, J. S. Sheldrick, O. Scheuermann, M. Dold, W. T. Graham, W. H Dawe, G. C. Fitzpatrick, H. Eckstein, E Rothschild. and F. Elkan, and the Comte de Ferrieres, representing 235,199 shares out of an issue of 502.306

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts said: The full details of last year's results, which have been in your possession for some time, will have been particularly interesting to you, because it represents the first complete year's run of your reduction works. You will, however, have noticed that the net profit of £54,072 earned during the year is, we consider, short of the normal profit that should be earned, and is therefore not sufficiently indicative of the value of your mine. The reason is that until August last, the native labour force was not sufficiently strong in number to provide more than an average of about 19,000 tons per month from the mine stopes, and the deficiency was supplied by crushing the development rock from surface dumps. There is a small profit to be obtained from the treatment of the surface dump rock, but it obviously does not supply an equal profit to that obtained from ore out of the stopes, and our object was to eliminate the surface ore entirely and replace with normal grade stope rock. As I have just said, we were not able to effect this until August last, when we had improved our native labour force, and on the occasion of the use of the surface dumps the grade improved by about 4s. per ton. Working costs were naturally increased somewhat, but the resultant profit, as you will have seen, showed a marked improvement.

Appropriation of Profit.

In looking at your appropriation account, you will see that to the year's profit of £34,072 there remained to be added an amount of £11,325 brought forward from the previous year. The total of £65,397 thus obtained was dealt with in the following manner. The Government profits tax paid was £6,800, and the amount spent on completion of the plant, buildings, etc., was £34,733, towards which sum, however, we had in hand two amounts of £1,111 and £3,651 in respect of proceeds of stands sold during the year and working capital unexpended. The net amount spent, therefore, on capital account out of your profits was £29,971, and we are left with a balance unappropriated of £28,626 which has been carried forward to this year's account, together with gold in reserve to the value of £2,768 which has since been declared.

Development Charges.

The only other figure in the balance sheet which calls for any comment is the item of £6,455 on mine development suspense account, which represents money charged out in working costs during last year and now in hand. Our practice is to include in our working costs every month a sum sufficient to develop a payable ton of ore for every ton taken out. Thus, under normal conditions of labour supply, etc., we should show at the end of every year rather more payable tons in reserve than we started the year with, and there would be no credit to development suspense account. Last year, however, as you will have noticed in the consulting engineer's report, in which the ore reserves are set out in detail, we had not sufficient labour to spend all the money provided for development, and the total payable reserves of 896,000 tons of 7.3 dwts. show a decrease of 62,000 tons when compared with the previous year. The ore reserve position is, nevertheless, perfectly sound, as you will have realised, and this decrease on the year need cause no anxiety whatever, because much of the footage accomplished was in the nature of advance work which, though not on the reef, will enable an appreciable tonnage to be added to your reserves without a great deal more work or expense. To illustrate what I mean, I would tell you that the 6th level, which is intended for a main haulage level, is being driven on straight lines, without reference to the reef. This level will extend right across from the central to the western shaft, and at the end of last year 1,000 feet of driving still remained to be done. Very active shaft sinking was also effected during the year, especially at the central shaft, which was deepened 858 feet and is now below the 12th level. This, I would point out to you, is an especially satisfactory feature when it is borne in mind that station cutting and cross-cutting has been in hand from the 9th to the 12th levels inclusive, and that your development work is now six levels ahead of the lowest point where stoping is in operation in the central section of your mine. This is a very strong position, because we thus have a series of attacking points which will appreciably facilitate the rapid development of ore during the current year if sufficient native labour is available.

The eastern shaft was also deepened a further 343 feet, but not much subsidiary development work was done here because it was more desirable to concentrate the available force around the central section—concentration in our work is always conducive to the best efficiency. From a consideration of these various points in our year's development work, I think you will agree, gentlemen, that I was correct in advising you that the comparatively small decrease in our reserves during last year need cause us no sleepless nights!

Development Values Normal.

As usual with us, most of the work was done on the south reef, and the values disclosed were normal, as you will have seen from the particulars given in the reports of your consulting engineer and manager. A considerable portion of the work was in ground in which, from the values we had met with in the ore above, we anticipated we should meet with rather lower values than the average of the mine. On the whole, the values of the south reef are satisfactorily maintained. As regards the main reef leader, we did a certain amount of work both east and west of the central shaft, with rather encouraging results. Since the beginning of the year we have had in hand more extended work on this reef between the surface and the 3rd level, and about mid-way between the central and western shafts. Very satisfactory main reef leader was met with, and we are now cross-cutting lower down, viz., from the 4th and 6th levels. If we meet with similar values there, we shall have reason to congratulate ourselves, because to have blocked out in reserve a fair quantity of payable main reef leader which is suitable for attack by machine drills helps us to become more independent of the fluctuating hand-labour force, and to keep up our tonnage in times when we are faced with a decrease in the numbers of that class of native worker.

Labour and Machine Drills.

The south reef remains, however, your most important gold carrier, and this reef is narrow, as you know, and requires for its most profitable working an adequate supply of good hammer boys. This supply is, as a rule, both limited and fluctuating, and with the great inconveniences of this fact in mind, the manager during the current months has been making careful experiments with small machine drills for working in the south reef stopes. His efforts in this direction are now showing encouraging results, as in last month 18 per cent. of the ore stoped was broken by small machines at an average stoping width of 42 inches. There is a good improvement to be noted here, because last year the ore so broken amounted to, roughly, 5 per cent. only.

The plant is giving excellent results, and the Butters filter plant, which was put into operation last July, has thoroughly justified itself. Your consulting metallurgist, Mr. F. L. Bosqui, describes your plant now as one which by its extraction results, occupies a leading position.

Current Year Prospects.

And now as to the position and prospects for the current year. I am not going to indulge in any prophecy, but I have given you the facts as disclosed by last year's operations, and will now indicate one or two features of this year's work. You will have realised that in your mine, as in others under our control, we are quietly but steadily trying to improve our facilities for the cheaper handling of the ore, and simultaneously to accomplish the work with less unskilled labour. You will have noticed, also, that your financial position at the end of last year, as reflected in the balance sheet in your possession, was satisfactorily clear of all debt. The profits earned for the first four months of this year have amounted to £23,500 (the profit for last month being £6,170), exclusive of the reserve of £2,980 also declared, and we have been considerably short of the tonnage for our full plant capacity. Further, I can assure you that all expenditure will be watched with an exceedingly careful eye, and last but not least, our first declaration of a 5 per cent. dividend in respect of the current half-year's profit will be made next month (Hear, hear.)

There have been several unavoidable changes during the year in the management. Your consulting engineer, Mr. W. T. Anderson, resigned in order to take up his present important position with the East Rand Proprietary Mines, Ltd., and we wish him success. Mr. Kinkead, who managed your mine from the start, also resigned to take up farming, and we feel sure that his energy and ability will continue to serve him in good stead in his new work. Mr. P. Cazalet is now your consulting engineer, and Mr. W. W. Lawrie has been appointed manager. To all these gentlemen, and to the respective staffs, our thanks are due for the good work effected during the year I have reviewed.

I now beg to move the adoption of the report and accounts for the year ended 31st December, 1911.

Congratulations.

Mr. Sheldrick: Do I understand that the company intends to declare a dividend?

The Chairman: **Yes.**

Mr. Sheldrick said that, speaking as an English shareholder, and for other English shareholders, who had held shares for a long time, he could not help feeling gratified at the distinctly improved position of the Bantjes. They had had to wait for a long time, but had always recognised the difficulties the directors had laboured under, and he must congratulate them on what seemed to be a very much improved position.

The Chairman said he was very glad to receive these congratulations. He had intimated the dividend because it was fairly obvious, from a perusal of the balance sheet, that the dividend would be formally declared in a few days' time.

The report and accounts were adopted.

The directors of the present board were re-elected and Messrs. C. L. Andersson and Co. and Mr. E. Danckwerts were reappointed auditors.

NEW UNIFIED.

Profits on the Up-Grade.

Tube-mill Advantages.

Mine looking well.

At the annual meeting of shareholders of the New Unified Gold Mining Company,

The Chairman, Mr. J. Munro, in moving the adoption of the reports and accounts said: In submitting the report of your directors and the accounts for the year ended 31st of December, 1911, I would refer you to the reports of your consulting engineer and mine manager, in which the fullest information of the operations for the year under review is contained. During the year 122,345 tons of ore were crushed, which is slightly under that for the year 1910, but owing to the reduction of 1s. per ton in the working costs and an improvement in the grade of two shillings per ton the profit of £51,987 16s. 11d. for the year shows the considerable improvement of £18,870 3s. 11d., to which should be added a sum of £1,155 12s. 3d. received from rents, sundry revenue, interest, etc., The amount available for distribution, including the balance brought forward from last year's account, was £60.078 8s. 6d., out of which two dividends of 5 per cent. and 10 per cent. respectively were paid to shareholders registered at the 30th of June, and 30th of December, 1911, and after providing for profits tax, depreciation, etc., a balance of £11,575 4s. 1d is carried forward to next account.

Improved Recovery.

You will notice from the consulting engineer's report that the tubemill started running in September, and that a considerable reduction in the value of the sands residues was effected after its installation. As usual at the end of the year the ore reserves were re-estimated and now amount to 288,343 tons of an estimated recovery value of 6.73 dwts. This quantity is slightly in excess of what it was last year and the value is about the same. It would be as well to mention that in this figure the main reef is not included.

Profits Advancing.

As to the future, I have pleasure in drawing your attention to the fact that the monthly profits at this mine continue on the upgrade, and the total gross profit for the first four months of the year amounted to £19,220. The mine is loking well, and in the bottom levels main reef leader of high grade has been exposed. The leader has been the mainstay of the New Unified, and it is worthy of note that there has scarcely been an unpayable patch. The sinking of the main shaft has proceeded steadily and the shaft had reached a total inclined depth of 2,588 feet at the end of April. There is every reason to believe that the present rate of profits will be maintained for a considerable time. It was originally intended to hold the annual general meeting of the company a the usual time, viz., the end of March, but in order to meet the wishes of the European shareholders it was postponed to this date. The reports and accounts were circulated, here and in London, about the end of March, an arrangement which gave sufficient time to shareholders on the other side to make representations if they wished to do so at this meeting.

A special general meeting will be held at the close of this meeting to make such alterations in this company's articles of association as to enable the annual meeting to be held at a date which will give European shareholders ample time to consider the reports and accounts prior to the meeting.

In September, 1911, Mr. F. B. Lewis, who had been in charge of your property for some time, was transferred to another mine of the group and Mr. J. E. Healey was appointed in his stead. I now beg to move the adoption of the report and accounts.

The report and accounts were adopted.

The appointment of Mr. Gustav Imroth as a director in place of the late Mr. Harold Strange was confirmed, and the retiring directors, Messrs. E. Danckwerts and S. B. Joel were re-elected.

Messrs. J. Mackillican and F. W. Bompas were reappointed auditors.

At the special general meeting which followed the articles were altered, as indicated by the Chairman, in the interests of European shareholders.

CITY DEEP.

The Lawsuit.

Letter from the Solicitors.

Ore Values of the Levels.

Remarkable Consistency in Values.

The annual general meeting of shareholders in the City Deep, Ltd., was held on the 30th of May. There were present Messrs. R. W. Schumacher (chairman), J G. Hamilton. J. H. Ryan, M. G. Elkan, H. Neuhaus, G. Sonn, J. E. Allingham, F. L. Brown, H. Daniel, F R. Lynch, D. Christopherson, W. H B. Frank, W. H. Dawe, C. Meintjes, M. Dold, E. A. Wallers, and S. C. Steil, secretary.

The Chairman, in moving the adoption of the report and accounts, said: I beg to present to you the reports and accounts for the year ended the 31st December, 1911. The working results for this period have not come up to our expectations, and cannot be regarded as representing the true capabilities of the mine. Only 349,713 tons of ore were milled, of which 260,661 came from the mine, and 89,052 tons from the surface dump. The working profit amounted to £134,886, of which £105,928 was derived from the ore mined, £24,986 from dump rock, and £3,972 from the treatment of accumulated slimes.

Indifferent Labour: Lack of Power.

The mine suffered severely owing to want of native labour, to the poor efficiency of the underground force, both white and black, and to the lack of compressed air during the earlier portion of the year. It was also found that better ventilation, as well as better facilities for the handling of men and material, were required for the upper levels of the mine.

Ore Reserves.

The total ore reserves at the 31st December, 1911, amounted to 1,911,883 tons, valued at 8.1 dwts., exclusive of 136,922 tons contained in shaft pillars which will not be available for mining until the close of the life of the mine. The ore reserves show an apparent reduction of 335.759 tons as compared with the figures given in the previous annual report. The difference is accounted for chiefly by the fact that our most recent calculations have been on more conservative lines, especially in regard to the areas above the upper levels of the mine. A considerable amount of additional work had also to be done in blocks that were already included in the ore reserves of December, 1910; it was found necessary, for instance, to continue driving the 7th level, which had been stopped in the hope that the ground between the 6th and 8th levels could be mined without it. In view of this decrease in the ore reserves the directors have, as they explain in their report, deemed it desirable to write off an amount of £25,713, which represents the difference between the actual expenditure on development during the year and the amount charged to working costs, and also a further amount of £15,022, which was spent in preparatory work just before stoping operations actually commenced. I must add that it has been decided to raise the development redemption figure from 2s. to 3s. 6d. per ton milled, dating from the 1st April, 1912. It is calculated that the higher figure will leave us on the safe side and enable at least one ton of payable ore to be developed for every ton of rock that is mined. When the company gets into its normal stride later on, and current development costs are less than 3s. 6d. per ton milled, the redemption figure will naturally be reduced and monthly profits will benefit accordingly.

Working Results: Development Good

The point that I would like to impress on shareholders most forcibly is that while the working results for 1911 have been poor, the mine development values have continued good. There is nothing whatever intrinsically wrong as far as the mine is concerned. I have been asked by shareholders to let them know the ore values in the City Deep level by level, so that they may have a fair idea of the prospects of the property. I gladly comply with this request. The following figures deal with the development up to the 31st March, 1912:—

Level.	Feet Sampled.	Average width of reef. inches.	Average value. dwts.
5th.	1,245	37.9	15.4
6th.	5.110	30.4	15.7
7th.	3.965	32	15
8th.	6,990	33.7	15.8
9th.	4,725	33.9	11.8

The 4th level has just been started from a raise above the 5th level in the neighbourhood of the west shaft, and the reef has averaged 90.9 dwts. over 9.6 inches for 65 feet sampled. Driving has also recently been begun at two points on the 10th level, near the eastern shaft—that is in a poorer section of the mine—and the values exposed over 135 feet driven are 9.6 dwts. over 37.8 inches. It is remarkable to see how consistently good the values have been from the uppermost level downwards.

Taking the ground from west to east the best and richest section of the mine, as far as we can judge today, appears to lie between the two shafts and extending for a distance of about one mile. I can give you the values in greater detail in the following way: Take the plan of the workings, which is issued with the annual report. This plan is on a scale of 1 to 10,000, that is, one inch on the plan represents 10,000 inches on the property. Draw a line from the top of the plan to the bottom, due north and south, just a little to the west of the No. 1 or east shaft. Then, to divide the property into sections measuring 1,000 feet from east to west, draw a number of other parallel lines at a distance of 1.2 inches apart from each other. You will find that you have divided the property into ten sections, of which all, except the two outer ones, represent distances of exactly 1,000 feet from east to west. I now give you the average values of the reef on all the levels together in each of these lateral sections, beginning with the western end. These values deal with the development as at the 31st March, 1912, that is they are three months' ahead of your map:

	Reef width. ins.	Reef value. dwts.
Extreme Western Section, 400 feet (6th level only)	30.1	11.9
Next 1,000 feet (going eastwards)	35.1	9.3
Next 1,000 feet (ditto) ..	43.1	8.2
Next 1,000 feet (ditto) (the No. 2 shaft is 150 feet to the right of the centre of this section)	30.0	16.9
Next 1,000 feet (going eastwards)	28.3	18.8
Next 1,000 feet ditto	26.4	27.6
Next 1,000 feet ditto	34.9	15.9
Next 1,000 feet ditto (almost up to No. 1 shaft)	33.5	16.0
Next 1,000 feet ditto	32.2	12.5
Last 500 feet (8th and 9th level only. These levels are cut off by the dyke near the Eastern boundary of the property)	26.3	5.9

One of the Finest Mines in Existence.

I have underlined the values in the richest section which extends over 5,000 feet. This mile of ground constitutes probably one of the finest mines in existence. Judging by the ore values in the Wolhuter property which lies immediately to the North, the whole of the large area of ground in the central portion of the City Deep extending from the present workings upwards to the north boundary is likely to contain ore of good value. On the 9th, that is the lowest level, the values in this portion of the mine also continue good, so it may fairly be claimed that no southern limit to the enriched zone has yet been encountered. The ground in the extreme east of the mine is somewhat broken, and the ore values suffer in consequence. In the extreme west the reef is, on the whole, unbroken and regular, but the ore values are a little disappointing. There are, however, distinct chances of improvement in this area because the values in the lowest levels of the Meyer and Charlton to the north and the City and Suburban Mine to the west are most encouraging.

I must add that little work was done during the year on the south reef. We hope to be able to pay more attention to the development of this reef in the near future.

I have quoted to you the values of ore development at considerable length because I wish shareholders to have the fullest information, and to realise the vast extent of the City Deep mine, consisting as it does in all of 1,098.8 claims, including 13.5 claims under waterright, equivalent to approximately 1,615 English acres.

Foolish Rumours.

Once shareholders realise the size, the importance and the value of their property they will no longer allow themselves to be scared by foolish rumours that are circulated from time to time by professional operators on the Stock Exchange.

The Law Suit.

You were officially informed last November, and again at the end of December, that the legal advisers of this company are of the opinion that no anxiety need be felt by shareholders about the lawsuit which has been brought by the Federation Company against the City Deep, Limited, in which the validity of our titles over 464 claims are brought into question. Our solicitors have, in reply to my request, addressed the following letter to the company:

28th of May, 1912.

The Chairman and Directors of the
City Deep, Ltd., Johannesburg.

Gentlemen,—As requested we now beg to report that the state of the case recently instituted against your company by the Federation Company, Limited, is as follows:

The action was commenced in December, 1911, and in it the plaintiffs allege that as successors in title to one W. B. Shormer they are holders of a certain agreement between him and the late Mr. Bezuidenhout, sen., the former owner of the farm "Doornfontein," whereby they are entitled to certain surface rights and, inter alia, part of the proclaimed portion of that farm, on which your company now holds 461 claims, and that your company's predecessors in title therefore could not legally have acquired their title to these claims.

From this you will notice that the plaintiffs do not assert that they have a better claim to the mineral rights now owned by your company, but merely allege that the origin of your company's claim title is open to question.

Acting on your instructions, we have done everything in our power to get the case disposed of as quickly as possible, and it is now set down for trial in the Supreme Court at Pretoria during the early part of August next.

Whether the plaintiffs will actually go on with the case must, to a large extent, depend on the judgment which will shortly be given in the action recently brought by the same company against the heirs of the late Mr. Bezuidenhout, sen., and Mr. Jan Eloff, which was heard during this month.

Apart from the other defences entered on behalf of your company, on the advice of counsel your company relies on the Bezitrechts, that is the confirmation of titles, which from time to time, strictly in accordance with law, were granted by the Government in respect of the aforementioned 464 claims, and if we remind you that your company's property is thus secured by the most complete protection which the Gold Law gives to holders of claims, we think that you can confidently look to the ultimate result of the case—a claim title covered by a Bezitrecht is unassailable unless obtained by fraud. No such plea has been put forward by the plaintiffs.

We trust that this long-standing matter will be once for all disposed of during the month of August.

Yours faithfully,
VAN HULSTEYN, FELTHAM & FORD.

This gives you the position up to date. I repeat the words "your company's property is thus secured by the most complete protection which the Gold Law gives to holders of claims." I must add that we shall endeavour to obtain judgment on the main issues. To win on some side issue that would not bring finality would be most unsatisfactory to us. An attack on long-established titles is a very serious matter and must indirectly affect all claimholders as well as ourselves. The sooner, therefore, the question is finally settled the better it will be.

Prospects of the Mine.

Referring back to the prospects of the mine, I would point out to you that working conditions are being gradually improved. The number of stope faces is being steadily increased by means of winze and raise connections between the levels; a crosscut from No. 2 shaft to the plane of the second level, a distance of 1,100ft., has recently been started, and should intersect the reef towards the end of the current year. This crosscut will greatly improve ventilation in the uppermost levels of the mine, and afford the increased facilities that are required for the handling of men and materials in that section of the property.

The efficiency of the underground force, which has been abnormally low ever since milling started, has commenced to improve, but the results are still by no means satisfactory. A deep-level mine like the City Deep must always experience some difficulty in attracting and keeping a good class of men. It is the usual thing for mines on these fields to lose at least 10 per cent. of their native labour force every month, owing to the fact that the natives will not work for long periods of time. Ten per cent. of the best and most experienced natives go and are replaced by an approximate equivalent number who, for the greater part, are untrained and ignorant of mining work. It naturally takes some time to teach these natives, and it may, therefore, be assumed that, under present condiions, at least 15 per cent. of the natives that have been trained leave the employ of the mining companies every month. This in itself is a great drawback, bu many of the mines are further handicapped by the monthly changes that take place among the white men, especially those working underground.

Peripatetic Miners.

At the City Deep these changes have been excessive, and have greatly disorganised our work and retarded our progress. It is most necessary to do everything possible to help to settle these men, who are of a migratory nature and like to roam from property to property. We propose now to offer them, as soon as they have been in the company's employment for a certain period of time, special building facilities on freehold lots in the township of Regent's Park, which belongs to the City Deep, and is situated on nice, rising ground a little over a mile away from the main shaft of the mine. Our intention is to encourage and to help men to settle down and to found their own permanent homes. This is what all great employers of labour in South Africa should do. We shall be actively assisting a section of the population, from which we may hope in consequence to draw a large number of our workers in future. We shall naturally start on a small scale, and not rush into heavy expenditure. The cost to the company will be small even if we give the land for nothing, or for next to nothing, as we hope to, and the indirect benefits should be great.

Financial Position.

As regards the cash position, the whole indebtedness of the company, as shown in the balance sheet, per the 31st of December, 1911, has been repaid out of profits, and the company has been accumulating cash since the end of March of this year. The further capital expenditure that the company has to incur in order to compete its equipment on the basis of crushing 60,000 to 65,000 tons per month, amounts to approximately, £45,000 from to-days date. This sum includes £10,000 to be spent underground for air mains, etc., £9,000 to provide accommodation for two thousand additional natives, and £16,000 for the installation of a sanitation system. There is also an additional sum of £20,000 that will eventually be required, though not for some time, for the electrification of the two Whiting hoists at the west shaft. There is no further expenditure in connection with the surface reduction plant, which is in excellent condition.

Future Liabilities.

I now deal with the cash liabilities as regards the underground work. We have, as you will remember, to continue to sink the eastern shaft for a vertical distance of approximately 800 feet in order to strike the plane of the reef. The cost of shaft-sinking is estimated at £25,000. This sum naturally does not include the further expenditure that will ultimately be necessary when this shaft will be used for the hauling of ore. It is the policy of the company, as you may know, to cheapen costs by concentrating all hauling operations to the western shaft for the time being; the western shaft is capable of supplying the mill up to 85,000 tons a month, and it will not be necessary to equip the eastern shaft fully until it is considered desirable to crush more than 85,000 tons monthly. All heavy equipment expenditure in connection with the eastern shaft will, therefore, not take place for some time. In reply to inquiries by shareholders, I would state that the cost of repairs to the mill has been very small, and that the slight surface cracks in the reinforced concrete work have caused no anxiety.

Nissen Stamps.

The four Nissen stamps, which were installed as an experiment to take the place of 10 of our ordinary 2,000lb. stamps, have been working very satisfactorily for a year, and have now been purchased by us.

Power Penalties.

Some shareholders have inquired what sum we have received for damages from the Rand Mines Power Supply Company for not having adhered to their contract and not having supplied us with the full requirements of power at the specified time. The answer is that the company accepted a sum of £4,202 as damages, and that we have now evry reason to expect that the full requirements of the company will be met before the end of this year. If we had pushed matters to extremes we should have had an expensive, lengthy and, perhaps, doubtful lawsuit, and we should at the same time have damaged the credit of the Power Company, and so have rendered it difficult for that company to raise the large additional cash funds required by it.

Dividends.

We now come to the question of dividends, about which shareholders are naturally anxious to be informed. I have told you that the cash position was about square at the end of March; that we have liabilities to be met in the near future amounting to about £45,000, apart from £25,000 for the sinking of No. 1 vertical shaft, and £20,000 to be spent later on the electrification of the hoists at the west shaft. We are now making profits at the rate of well over £20,000 per month. For the month of May we shall have increased our tonnage milled to about 35,000 tons from the mine, and it is hoped that the company will be crushing the full 60,000 tons at about the end of the year. It will be seen, therefore, that the rate of monthly profits should undoubtedly increase. It is obvious that no dividend will be declared at the end of June next, but there seems to be every likelihood of a small dividend at the end of the current year. After 1912 shareholders ought to be able to expect with confidence the distribution of regular and satisfactory dividends.

I have endeavoured to explain that the general prospects of the mine are bright; that the profits are, as far as we can see, bound to improve; that our legal advisers have no anxiety about the pending law suit, and I trust that shareholders who have been patient so long will bear a little longer that they may reap the full rewards which we firmly believe will now soon come.

I have to record that Mr. J. H. Whitford, who did very good work in developing the mine, resigned his position as manager last June. Mr. J. M. Morris was appointed in his stead, but his services were dispensed with in January, when Mr. M. Tillard was appointed acting manager.

Mr. Hamilton's Confidence.

Mr. J. G. Hamilton seconded the adoption of the report and accounts. He remarked it was quite evident from what the Chairman had said that the results so far obtained in milling were not representative of the possibilities of the mine. The developments level by level given by the Chairman were exceptionally good, and pointed to the fulfilment of the most sanguine expectations as to the ultimate results. They had suffered by a considerable shortness of native labour, and even then much of the labour obtained by a new producer was absolutely untrained, and it took time and money to make it efficient. In regard to the ore reserves he had no hesitation in thinking that the values would more than make up for what ore reserves might have to be written off. He endorsed the Chairman's hope that a small dividend would be paid at the end of the year, but even if that were not so he felt confident that the normal stride would have been gained next year and that the company would then be pursuing that successful career to which it was entitled.

The report and accounts were adopted.

The meeting confirmed the appointment of Messrs. E. A. Wallers, F. R. Lynch, M. G. Elkan and J. H. Ryan as directors vice Messrs. H. C. Boyd, J. G. Hamilton, H. Neuhaus, and Sir Abe Bailey resigned.

Messrs. E. A. Wallers and M. G. Elkan, retiring directors, were re-elected.

Messrs. C. L. Andersson and Co. and Mr. C. Stuart were reappointed auditors, and their remuneration for the past audit fixed at two hundred and fifty guineas each.

VILLAGE DEEP

Policy of Development.

Maintaining Ore Reserves.

Brighter Dividend Prospects.

The twelfth annual ordinary general meeting of shareholders of the Village Deep, Ltd., was held on the 30th of May, in the board room, Corner House. Mr. H. C. Boyd presided, and there were also present Messrs. Charles Marx, H. Eckstein, T. Reunert, Raymond W. Schumacher, G. Sonn, H. Daniel, W. M. Brown, J. Munro, P. Richardson, B. T. Bourke, M. Honnett, J. Jolly, J. E. Allingham, B. Southwell, W. H. B. Frank, F. L. Brown, A. Mendelssohn, and E. A. Wallers, representing 372,868 shares out of an issue of 1,060,671.

The Chairman said: This meeting has stood adjourned till to-day in order that shareholders might have ample time to consider the reports and accounts for the year 1911 which are now submitted for your approval. You will have seen that the scale of operations increased materially during the year, 29,132 feet of development being effected, an increase of more than 5,000 feet; while nearly 62,000 tons more were crushed than during 1910; and the recovery was over 2s.1d. per ton higher. This improvement in grade was mainly due to somewhat increased sorting, better extraction—owing to improvements effected in the plant—and closer mining. The increased amount of south reef milled is noticeable, and this probably also had an appreciable bearing on the improved recovery. It is to be noticed that the manager records that the actual yield from this reef was higher than the development values had led us to expect. Working costs were nearly 3d. per ton higher, so that the working profit for 1911 was 8s. per ton against 6s. 1d. for 1910, a very satisfactory feature of the year's work. The net profit amounted to £227,332 7s. 5d., or an improvement of a little over £67,000 compared with the previous year's results. Two dividends of 5 per cent. were distributed, which absorbed £106,067 2s., and capital expenditure was met amounting to £134,800 0s. 9d., which included £6,465, the payment for a period of fifteen months for the undermining rights acquired in respect of 7.3 claims as recorded in the report for the year 1910. I am glad to say that the reef in these claims is opening up satisfactorily. Full details are given in the manager's report of the capital expenditure, which was mainly on the equipment of No. 3 shaft, underground equipment in the Turf section, electrification of the plant, improved and extended accommodation for whites and coloured employes, and on excess development.

Large Development Footage.

Mention has already been made of the large development footage accomplished during the year, which is fully detailed in the manager's report. No. 1 incline shaft was connected with the Turf Mines workings on the 16th level, and a main haulage way has been opened on that level between the two incline shafts. The ore reserves, as recalculated at the 31st of December, had the same average value as at that date in the previous year, while an increase of, roughly, 216,000 tons is shown. The increase in south reef is a matter for congratulation. As is pointed out in the reports, the ore reserve figures do not entirely reflect the improvement effected in the development position, as owing to the fact that the main reef leader drives had been largely carried in the footwall, an additional tonnage had been blocked out by drives, and to a great extent by the necessary winzes, but not valued at the close of the year, as the necessary box-holing had not been done. If, as was expected, 80 per cent. of this ore should prove to be payable, additional 633,000 tons would thereby be brought into the payable ore reserves at a comparatively small cost. I am glad to be able to state that the amount of this ore transferred to the ore reserves during the current year, tends to show that this estimate of payability is conservative. As is stated in the directors' report, we do not now aim at doing more than maintaining the ore reserves. In pursuance of this policy the scale of development has been reduced during the current year. The reef disclosures compare very favourably with those of last year. The intention is to meet all further expenditure on development and incline shaft sinking out of working costs, and to that end, as you were informed in the report for the quarter ended the 31st of March, the charge for development was raised from that month to 3s. per ton milled. It may even be necessary to increase this to 3s. 6d. per ton milled to cover the expenditure for the year. This is being considered. It is well to emphasise the fact that in addition to the current development work a large incline shaft 38ft. 6in. wide and a smaller development shaft are being sunk in the Turf Mines section from the 17th level. At date the shafts are 360ft and 300ft. deep respectively on the incline. In addition, the cost of running No. 3 shaft exclusive of ventilation and pumping charges has to be met out of this development charge as that shaft at present is virtually only used for handling men, materials and rock in connection with development. A suitable charge is, however, made against any small tonnage hauled for the mill, with which the shaft running expenses are credited. This condition of affairs must continue for at least this year. If the machinery on order, to which I shall presently refer, comes forward in time, we shall be in a position at the end of the year to close No. 1 vertical shaft entirely, and to drop all the rock from the eastern half of the Village Deep section and most of the ore from the western down to the main haulage on the 16th level Turf section, whence it will be hauled through No. 3 shaft.

Further Expenditure Necessary.

With the adequate electric power supply which should then be available this centralisation, which is necessary for the working of the mine in depth, should favourably affect our working costs. To attain this position, however further capital expenditure is unfortunately necessary. A new man hoist has to be provided at No. 2 shaft capable of lowering men to the 16th level. The Whiting hoist at No. 3 shaft has to be electrified, and larger reels must be provided for both the hoists to permit of rapid hauling. Various items of surface expenditure must be incurred round No. 3 shaft, and trucks, etc., must be provided for the 16th level haulage. That is, something in the neighbourhood of £40,000 have yet to be spent this year. The profits earned to the end of April have amounted to £93,310, making with the special declaration of the gold reserve in March a total profit of £118,065, out of which about £12,000 have been spent on capital account.

Provided development values continue in their present satisfactory position, a recovery in the neighbourhood of 28s. 6d. per ton on the average can safely be reckoned on. With the higher costs now ruling, due to the necessity of meeting the comparatively heavy underground expenditure out of working costs, it has been deemed expedient to raise the pay limit somewhat for the time being. This entails leaving 175,000 tons of the reserves standing temporarily, but enables us to aim at the grade just mentioned without any danger of reducing the average value of the remaining reserves.

Payable South Reef.

62,000 tons of payable south reef have been developed during the first four months of this year, and we are at present developing payable ore on this reef on eight levels to the west of No. 2 Shaft. On the tenth level, midway between No. 1 and No. 2 Incline shafts, payable south reef has lately been discovered, the first time payable values have been disclosed on this reef in the centre of the property since a small body was found several years ago on the first level. Further exploratory work will naturally be conducted in this direction. Even more important is the fact that generally the disclosures in the Turf section are better on the whole than the average of those in the Village Deep section. South reef of encouraging value is being opened at either end of the 17th level, and it is interesting to note that in the lowest workings of the property good values are being obtained. The development incline from the 17th level, which, as I have already mentioned is 300 feet deep, is being sunk on the main reef leader, which has averaged throughout that distance 12.8 dwts. over 47 inches. The main incline, which at first carried the main reef leader, exposing very similar values, is now carrying the main reef, which at present is payable. Without attaching too much importance to individual figures such as these, it is obviously extremely encouraging that the bottom of the mine should be giving such satisfactory indications.

Confidence.

From the general position of the mine, therefore, it is clear that we may look forward with confidence to materially increased dividends during the current year. To Mr. H. Stuart Martin, the consulting engineer, Mr. J. Whitehouse, the manager, and his staff, we are indebted for their efforts which have enabled us to record very material improvement in the position and prospects of our property. I feel sure that I shall only be voicing your feelings in saying how deeply we deplore the death of Sir Julius Wernher, in whom the industry has lost a great leader in every sense of the word, and that we all desire to extend to his family our deepest sympathy in their bereavement. I now beg to move, the adoption of the directors' report and statement of accounts.

The report and accounts were adopted.

Messrs. J. H. Ryan and E. A. Wallers, retiring directors, were re-elected. The auditors, Mr. T. Douglas and Mr. C. Stuart, were reappointed.

Directors Increased.

The annual meeting was preceded by a special meeting, when a resolution was passed increasing the number of directors from eight to nine. There were five hundred and seventy proxies against the change.

In reply to Mr. Daniels, the chairman stated that the increase of directors did not mean an increase in directors' fees.

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Notes and News.

General Mining Meeting. Though the annual meeting of the General Mining and Finance Corporation took place yesterday, we are, unfortunately, precluded from publishing a report of Sir George Albu's speech, owing to our having to go to press at an early hour. In our next issue, however, we hope to deal with Sir George's remarks.

* * * *

East Rand Central. East Rand Centrals have been the cause of some excitement on the Stock Exchange this week, owing to the receipt of buying orders from London. It is hoped on the other side that the good news from Brakpan will facilitate the framing of a scheme to finance the 424 claims on Schapenrust belonging to the company. Even if the scheme fails, the shares are not much over-valued, as the company has about 8s. per share in hand, apart from the claim-holding.

* * * *

Viking Developments. Work has been quietly proceeding at the Viking mine, near Salisbury, for between two and three years, and judging from the latest reports the owners are to be congratulated on possessing what has every appearance of being a really valuable property. In the eastern section of the mine the main shaft is being sunk with all rapidity and is expected to reach the 500 feet level by the end of August next. The main shaft of the west section has also been taken in hand and is expected to reach the same level at the end of the year. The new compressor plant is working admirably, and driving is proceeding from all possible faces. It is expected that a reduction plant will be started up in about twelve months' time. Mr. W. P. Fisher has just recently returned to Johannesburg from the mine and expresses himself well satisfied with the position there.

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Neumann Mines. There is nothing very eventful to be recorded in connection with mines under Neumann control. The productive concerns plod steadily along, and are securing good results. At the Witwatersrand Deep, it is particularly gratifying to learn, the water trouble shows some sign of abatement, although it may be a considerable time before the effect of this is observable in the shape of increased profits. The Wolhuter is securing consistent returns. At the Main Reef West the labour position is improving, and the tonnage crushed last month was greater. As stated elsewhere in this issue, a large Sirocco fan is being installed at the East shaft of the Knight Central mine.

* * * *

Latest from the Village Deep. From all accounts the Village Deep property is looking very well at present, and the outlook for maintenance of profits is good. The April crushing was 49,200 tons, and a profit of just under £23,000 was won. During May a record tonnage, it is satisfactory to note, was put through the mill. The large Sirocco fan is running satisfactorily, and not only maintains good ventilation conditions in the Village Deep, but it has much improved the volume and quality of air in the adjacent Village Main Reef mine as well. In the Turf Mines section the steep dip of the reef referred to in previous issues of this journal is being maintained, and, as has already been pointed out, this stratigraphical feature has a marked and important influence on the tonnage per claim contained in the southern blocks of the proposition.

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Piggs Peak. The Ruby Creek Concession, belonging to the Piggs Peak Development Company, is now being actively prospected by the company. The concession covers a large area, which is believed to be mineralised. Latest reports from the Piggs Peak mine are highly satisfactory.

Barnato Profits Increasing.

The eight producing subsidiaries of the Barnato group earned an aggregate profit for last month of £66,133, which is £2,797 better than the April earning. The same number of stamps (970) were in operation, but over 5,000 additional tons were milled, and the output was £8,500 higher. The Consolidated Langlaagte, Ginsberg, New Primrose, New Unified, and Witwatersrand each record increased profits; the declines in the profits of the other subsidiaries are small and unimportant. In each instance where a greater profit is announced, a larger tonnage put through the battery is evidently the reason for the improvement. The grade appears to have been uniformly maintained, and the working expenses show little or no fluctuation. The Witwatersrand (" Knights "), it is to be noted, crushed over 40,000 tons during the month, and the profit was over £19,000. Both this mine and the New Primrose, at which a profit of £18,192 was earned, appear to be achieving very satisfactory results. The Consolidated Langlaagte's profit of £9,239 compares favourably with £8,640 earned in the preceding month, and now that the new mill is about to start up, increasing returns may be looked for from this venture. The Johannesburg Consolidated Investment Company's profits have, it is to be observed, been steadily increasing since the beginning of the year. In January and February they were under £60,000, but the March earning was £61,223, that for April £63,336, and for May £66,133.

* * * *

Consolidated Mines Selection Co.

The speech of Mr. Francis Muir at the meeting of the Consolidated Mines Selection Co. in mail week was interesting, because of the promise it held out for the future. The company, as is now well known, is largely interested in the Brakpan Mines, the Transvaal Coal Trust, and other enterprises, but its chief asset is Brakpan Mines. Brakpan will reach the dividend-paying stage this half-year, a distribution of 15 per cent. having been officially foreshadowed, and a somewhat higher dividend at the end of the year. As regards the Transvaal Coal Trust, this company has been paying dividends for a number of years, and now that its large holding of Brakpans (it may be recalled that the company sold its gold mining rights to Brakpan for 260,000 fully paid shares) is about to fructify, the dividends should be considerably enhanced. Altogether, therefore, the Consolidated Mines Selection Co. is in an extremely happy position, and having last year reduced its capital by writing off a large sum representing previous losses, there is nothing standing in the way now of the shareholders receiving substantial dividends. There is, of course, a debenture debt of £117,320, but this is being reduced.

* * * *

The Laying of Dust in Mines.

The references to the dust problem by Mr. R. W. Schumacher at the annual meeting of the Rand Mines, the other day, will be a source of genuine satisfaction to all who feel concerned with regard to the ravages of miners' phthisis. " A great deal of knowledge and experience," he remarked, " has been gained during recent years, and measures that we believe to be effective have already been taken on a number of the mines. Phthisis is caused by the dust from the hard sandstone rock. This dust must be laid immediately by the free use of water, at every point where it is raised, whether in drives, raises, stopes, or elsewhere. Water must be laid on at every necessary place in the mine, and the men must use it. We have been making interesting experiments at the City Deep lately by mixing molasses with the water that is sprayed, and the results have so far shown that this is a decided improvement on the use of water alone. I repeat that our belief is that if a great combined effort is made on the lines that I have indicated the fatal disease of miners' phthisis can be reduced to very narrow limits, and we are of opinion that the contribution to the insurance fund will, after a few years, assume comparatively small proportions."

Wetting Materials.

The use of molasses as a means of maintaining the dust in a moist condition after it has been laid by spraying is an important part of the treatment by water—probably the most important. The laying of the dust is a comparatively simple matter; the essential point is to keep it laid, if the process is to be really efficient. Various chemicals have been used for the purpose in European collieries, such as crude salt or chloride of lime, but the results are said not to have been commensurate with the expense involved. The hygroscopic character of molasses seems well suited to the purpose of binding the dust into a sort of adhesive paste, even after the original supply of water has been almost entirely evaporated, while the proximity of the sugar fields in Natal should render it cheap and abundant.

* * * *

The Central Mining Meeting.

The mail brings the full report of the Central Mining meeting in London. Central Mining and Investment Corporation, Ltd., is that which, as is well known, took over the interests of Messrs. Wernher, Beit and Co., and is, perhaps, the most important concern on the Rand, from the point of view of figures. It does not confine its business to the Transvaal, or even to West Africa and East Africa, in both of which it has large interests. At present, the company's share interests in South Africa, as well as its investments in British and foreign Government securities, amount to £5,819,000, as against £3,628,000 a year ago, of which the increase of about £1,200,000 is accounted for by the purchase of the Eckstein interests, and £1,000,000 has been invested in gold mining shares. The company has invested £1,800,000, which is not yet dividend-earning, but a considerable part of the amount should reach this stage during the present year. The income for the last eighteen months reached £513,000, of which £446,000 was net. Dividends paid have amounted to 16s. per share, or 4½ per cent. on the capital, and, as will be remembered, there was no final dividend for 1911. The resumption of dividends was foreshadowed by Mr. F. Eckstein, who presided, after the close of the current half-year's operations. £450,000 has been put to depreciation, but market quotations already show a surplus of £100,000 over the amount thus set aside, and £67,000 is carried forward. The decline of gold mining shares, Mr. Eckstein remarked, has been continuous, but it has gone too far. He announced that Central Mining's Johannesburg office " rests on a basis which should be a guarantee against any errors or possible improper conduct on the part of any official not being discovered within a short period. The system is to allocate consulting engineers to the different mines, and this, coupled with a keen supervision from the head office, and the mechanical and metallurgical departments, enables the Board to keep a close check on the mine management itself." It is satisfactory to know that the profits of the Central Mining group last year exceeded those of the previous year by £340,000. Improvement is the order of the day, but it has involved much capital expenditure, of which the full benefit has to be seen.

* * * *

The Future of " Tanks."

The proposals for the increase of the capital of the Union Minière were accepted in mail week with the unanimity customary on these occasions. The Union Minière is to increase its capital by 25,000 shares of £4, which will be issued at £16, and will also issue £400,000 of 4½ per cent. bonds. At the same time, it will have to issue 25,000 shares, which are called dividend shares, having no capital value, but having the same rights as the £4 shares. These shares will be issued to the Katanga Committee, which will hand over 40 per cent., or 10,000 shares to the Tanganyika Concessions. The Tanganyika is a creditor of the Union Minière, and is to receive bonds in liquidation of the debt. It will also, as a shareholder, be entitled to subscribe for its quota of the new capital shares, but assuming that other people are willing to take up the new shares of the Union Minière, it does not appear that the situation imposes any strain on the resources of the Tanganyika, though it may entail some reduction in its proportion of interest in the property. M. Jadot's mission to the Congo confirms the reports of the value of the properties. It supports the proposal to build coke ovens, which should be producing coke delivering coke to the Star of the Congo at £5 10s. per ton. Before then, however, the Wankie Company should be delivering coke to Star of the Congo at £5 10s. per ton. The proposed electrical process is being investigated in Europe. The technical control is to be modified. In future there will be a single direction in Africa under the supervision of the Board advised by a technical committee having its headquarters at Brussels.

* * * *

Rhodesia Gold Mining and Investment.

The report for the year 1911 of the Rhodesia Gold Mining and Investment Company shows a net realised profit of £6,217. The share assets, taken at their market valuation at December 31, show a further large unrealised profit, but the directors believe that these prices do not represent the value of their holdings, and have thought it better not to realise any large number of shares, as they expect to get a considerably better price. The company has a considerable interest in Lonely Reefs and Cam and Motors, and has sold the fifty-eight claims of the Sabi mine and 280 adjoining claims to the Sabi Gold Mining Company for 130,000 fully-paid shares and some cash. The other principal mining properties in which the company was interested at the end of the year were the Bernheim group, the Pretty Polly, and the Felixburg claims. The Pretty Polly started crushing in June, 1911, with a 5-stamp battery, and up to the end of the year had milled 3,607 tons for a yield of £10,988, which showed a profit on treatment of £4,699; and on the Felixburg claims prospecting has shown such results that the consulting engineer considers that development should be extended so as to open up enough ore to justify the erection of a small mill.

* * * *

The Geology of Van Ryn and Modderfontein.

In the treatise on the "New Geology" of the Witwatersrand system which he prepared to accompany his geological map of that portion of the Southern Transvaal, which is covered by the beds of the system, Mr. W. E. Bleloch gave a special sketch map to illustrate his views regarding the continuity of the Van Ryn and Modderfontein series of reefs through the Kleinfontein and Klipfontein areas and on to Rietfontein. Since then he has been busy prospecting along the line with the object of giving practical demonstration of the truth of his theory that these reefs are to be found more or less exactly as they are shown upon his map, and, as a result of his operations, he considers that his evidence is now fairly complete and unassailable upon any grounds. The continuity of the lower Witwatersrand beds to the north-east of Boksburg, instead of to the south-east, has always been easily susceptible of proof. The more important proposition, that of the identity of the Van Ryn and Modderfontein series, with other series distinctly traceable to the north of the Blue Sky series on the claim area of the East Rand Proprietary Mines, has not generally been accepted. The evidence collected by Mr. Bleloch in support of this view is unquestionably strong, and as far as ocular demonstration can go, his proofs, in the shape of parallel sections and comparative samples of reef and country rock, appear indisputable. In connection with this work, a syndicate, named the Rietfontein-Van Ryn Extension Syndicate, Ltd., with a nominal capital of £40,000, is being floated, primarily to deal with various claim areas extending over a distance of nearly 5¼ miles, from about three-quarters of a mile east of Rietfontein Station to the large pan south of the Benoni Township. From the title it will be evident that Mr. Bleloch disputes the view of the Geological Survey with regard to Rietfontein. How far facts corroborate his attitude on this question we are unable to say without further information, but, as regards the other part of the theory, that of Van Ryn and Modderfontein extensions, his evidence, as we have remarked, is undoubtedly strong.

TOPICS OF THE WEEK.

THE RAND MINES MEETING.

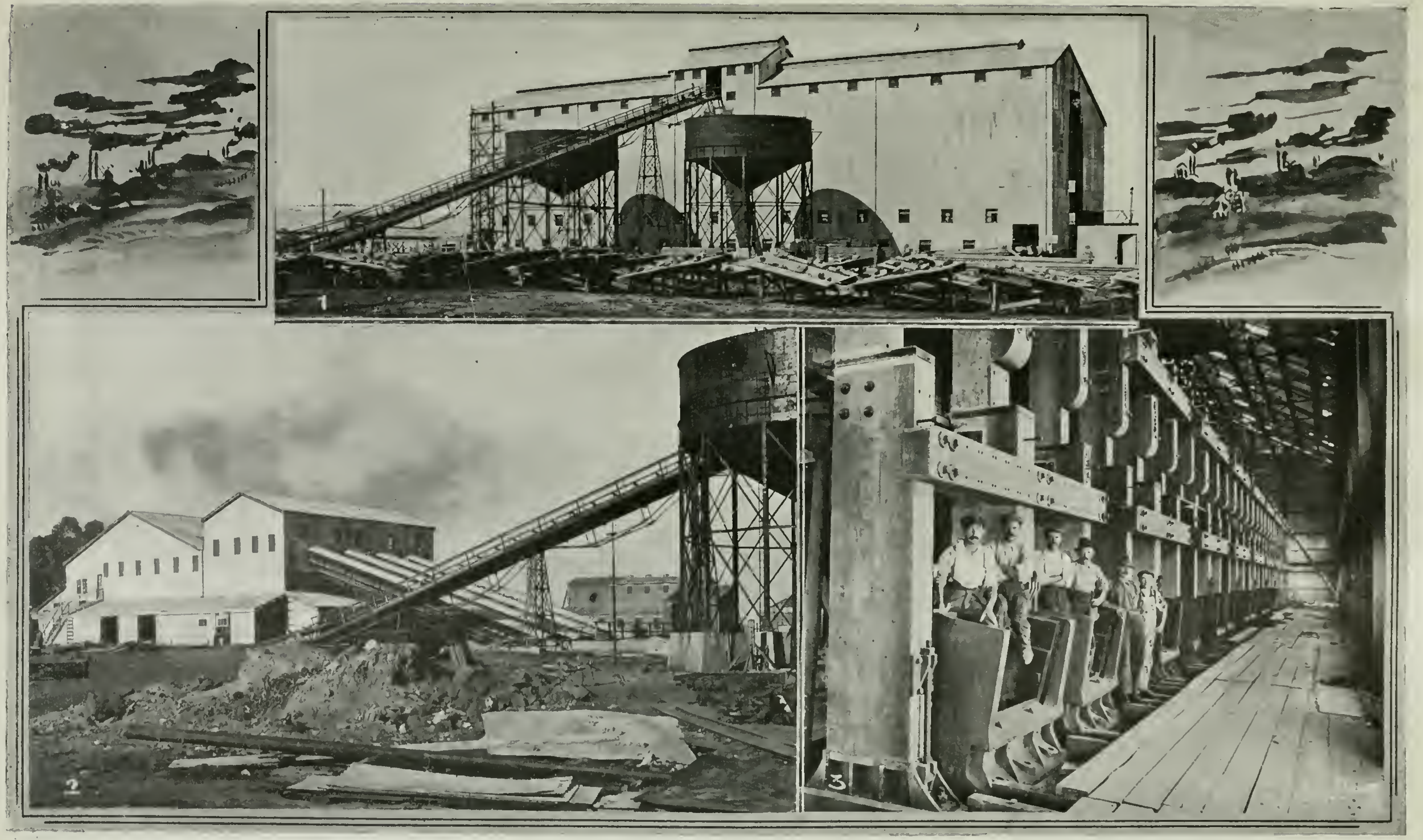
The Rand Mines annual meeting this week provided the Chairman, Mr. Schumacher, with the opportunity to review the industrial features of the year, to make several announcements of some novelty, and to reiterate the confidence of the chief controlling house in the future of the Rand. The absence of any reference to politics, *qua* politics, and the brevity of the remarks dealing with native labour, distinguished Mr. Schumacher's speech from that made on the same occasion in former years. Lengthy as is this year's speech, and detailed as it may, in places, necessarily be, the shareholder and the student of Rand economics can afford to miss no part of it. Mr. Schumacher's brief review of the position and prospects of the individual mines of the Rand Mines group is as succinct and compact of information as such a review well can be. We print it this week in detail, and we need not dwell further on it here. Regarding general progress during the year, Mr. Schumacher spoke without undue enthusiasm. The big programme of reform sketched by him last year, he admitted, was still far from completion. Indeed, its ambitious nature entailed nonfulfilment at so early a stage. "We have only had time to achieve partial success," he said. "We have, though, already improved, and we think permanently improved, the working conditions of some of our important mines, and these improvements are indicative of further progress that is to follow. At other mines we have not been able to make as rapid an advance; conditions everywhere are not equally favourable, and in some cases more time is required to achieve success than in others; but everywhere the signs are not wanting that we are working on right lines. I deal first with the mines where the better results are most marked—mines that are already working at ease, if I may use the expression; that is, without constant and undue pressure, which is never conducive to good work." On the big questions that concern all the mines equally, such as metallurgy, power supply, native labour, phthisis, housing, bewaarplaatsen and taxation, Mr. Schumacher had many true and authoritative and several new and interesting things to say. In metallurgy, owing principally to the introduction of the Butters' filter and to more efficient tubemilling and classification, Mr. Schumacher was able to point to the number of improvements that have been effected; and to the fact that the recovery of dissolved gold is regarded as practically complete, the loss, as compared with that in the old decantation process being almost negligible. On the vexed question of an agreement regarding native labour between the groups, Mr. Schumacher contented himself with a pious hope, but his remarks on the subject of economy of labour underground, though brief, indicated that directors are at last fully alive to what is a notoriously weak spot in the industry. "The labour position generally," he said, "is more favourable to-day than it has been recently, but some of our mines have been, and still are hard pressed, for the supply has not kept pace with the ever-increasing demand. I must add, though, that it is the belief of most people who have a thorough knowledge of the subject that great economies can still be effected in the use of native labour, especially underground, where it is chiefly employed. The organisation and control of native labour on the mines is not everywhere as perfect as it might be, and this is a point to which we call the special attention of our mine managers." That a steadily increasing use is being made of small machine drills is proved by the following comparison drawn from the mines of the Rand Mines group: The percentage of tonnage from stopes in December, 1910, was:—By large machines, 57 per cent.; by small machines, 3 per cent.; by hammer boys, 40 per cent. In December, 1911, it was 58 per cent., 14 per cent. and 28 per cent. respectively. The excellent housing scheme started at the City Deep bids fair to have many imitators; and it is good news that the Minister of Mines is favourably disposed to the Rand Mines proposals to utilize for model villages the surface rights not required for mining purposes, on other properties. Mr. Schumacher's statement on the intricacies of the power question was detailed, but not more so than the shareholders have a right to expect. The chief features of the settlement that has been come to between the Rand Mines and the Power people are the payment of a lump sum of £35,000 as liquidated damages, and the acceptance of a new form of contract "which appeared desirable in the light of the experience so far gained." Mr. Schumacher's remarks on the phthisis question we deal with elsewhere; and it only remains to note his conclusions on the outlook in general. No better proof of the confidence of the directors in the future could be adduced than their decision to pay a dividend of 110 per cent. for the current half year, though Mr. Schumacher admitted that the company had not altogether earned it. "We consider," he said, "that our action is quite justified, in view of the improved results which we expect from our companies before very long." Mr. Schumacher examined, with pardonable pride, the future of the Rand Mines, Ltd. Apart from the possible new discoveries or new assets that may be acquired from time to time, the future of the company lies in the working of the great mines that are of proved value and that own immense stretches of deep level ground. In the Central Rand it commands the deep level ground uninterruptedly from the western boundary of the Crown Mines to the eastern boundary of the Nourse Mines, a distance of over eight miles. The lives of its mines in this central area will not necessarily be limited by their present southern boundaries. Reefs at the southern boundary of the Crown Mines, Ltd., of the Village Deep, Ltd., of the City Deep. Ltd., and Nourse Mines, Ltd., in Mr. Schumacher's opinion, will lie at so great a depth that no new company will ever be formed to work them further to the south and at a still greater depth. This is regarded as tolerably certain owing to the enormous capital expenditure and to the risks that would have to be incurred in starting new mines at vertical depths of, perhaps, 7,000 feet or more. It follows, therefore, that as long as the reefs continue payable in this central and richest portion of the Witwatersrand they will be followed down in the workings of existing deep level mines. "We know today of no limit that can be placed on the lives of these mines," added Mr. Schumacher; and he went on to point out how the improvements in depth at the City Deep and Turf Section of the Village Deep, coming below extensive poor zones, go to support what has been termed the most encouraging "blotting-pad" theory of the distribution of values in Rand banket. "No limit," he said, "can yet be determined regarding the life of the Witwatersrand, and the future of the Witwatersrand is inexplicably interwoven with that of the Rand Mines, Ltd." Mr. Schumacher's views on the future will naturally command great attention. He said: "I need not dwell on the vast opportunities for expansion and improvement in the extensive mining areas to which I have referred, in which the Rand Mines, Ltd., is vitally interested. It will be realised that these opportunities do exist, and it may, I think, be assumed that we shall not fail to act when we consider that the time is ripe. I need scarcely say now that the Modderfontein B. will not always crush at the rate of only 30,000 tons a month, or the New Modderfontein at the rate of 50,000 tons monthly, or the City Deep at the rate of 60,000 tons, or the Village Deep at the rate of only 52,000 tons; but things cannot be hurried and people must be very sure of their ground in every respect before any new big programme is entered upon. . . . We have had a long and arduous climb, and have had to experience serious set-backs and disappointments, such as the repatriation of the Chinese, from time to time; but we are at length approaching the top of the hill. Everything points towards gradually increasing profits, and we feel that if we gain the goodwill of the Union Parliament the results that will be obtained in the future should surpass all those of the past." These are wise and weighty words, carrying confidence to shareholders, and to the Government the best of advice and a warning. The interests of the country are still identical with the interests of the mining industry, and to the progress of the latter are essential not only labour, capital and highly specialised ability, but likewise and not least, the enlightened sympathy of the Government.

THE REVISED PHTHISIS BILL.

The amended Miners' Phthisis Bill was briefly reviewed in our last issue, and during the week the Bill has been further subjected to the modifying processes of the Union Parliament. Its final form is, therefore, still wrapt in uncertainty, though it appears clear that the Bill will become law in some shape or other by the end of this session. There are several particulars in regard to which the Bill can, and, no doubt, will, be improved; but these may safely be left to the attention of Parliament, which, indeed, has already devoted unwonted patience and attention to the measure. To recapitulate the main points of the amended Bill:—It is proposed to divide all cases into two sections; firstly, for existing cases in respect of which applications will be made during the first two years after the Bill comes into force; for these a special compensation fund is to be formed; secondly, for cases that will arise after the expiration of these two years, for which an insurance fund is to be instituted at once. It is laid down that the Government will contribute up to £100,000 towards the compensation fund, while the mines are to bear the whole of the remaining liability in respect of past accumulations of phthisis. The insurance fund, which deals with new cases, is to be formed by contributions from the mines and from the underground employes. For the first two years after the new Bill passes into law the mines are to pay a contribution equal to 5 per cent. of the wages of the underground employes every month, of which they may deduct one-half from the employes. After the first two years the contribution is raised to 7½ per cent. of the earnings of the underground employes, of which the mines may recover one-third from their men. Referring to the Bill at the Rand Mines meeting on Wednesday, Mr. Schumacher said: "It is a little too early to state with a reasonable degree of accuracy what the liabilities are that have thus been imposed on the Witwatersrand mines, but we assume that, roughly, the compensation fund will require nearly £1,000,000 to deal with the estimated number of cases in the first two years. The burden laid on the mining industry by the compensation fund is a very heavy one." "Our belief is," added Mr. Schumacher, "that if a great combined effort is made on the lines that I have indicated the fatal disease of miners' phthisis can be reduced to very narrow limits, and we are of the opinion that the contributions to the insurance fund will, after a few years, assume comparatively small proportions." As regards the compensation fund, it is the general belief that the mines have not been quite fairly treated. The Government have not seen their way to adhere to the plan originally outlined by them when they approached the leaders of the mining industry early last year. It was then suggested by the members of the Government, particularly by the then Minister of Mines, that as the legislation that was intended would be partly of a retroactive nature, the Government was prepared to pay half of the compensation to be granted for the first two years, while the mines were to pay the other half. To-day, however, the Government calmly proposes to reduce its contribution to £100,000; and but for Mr. Merriman, according to his own showing, the Government would not offer anything at all. Why the State should seek to repudiate a self-admitted liability, merely because, as Mr. Schumacher showed, that liability has increased, passes comprehension, and why a purely arbitrary lump sum, sprung from the impish brain of Mr. Merriman, should be hit upon is equally puzzling. The Government has not the excuse that the industry has failed to offer constructive advice. In the evidence tendered by the Chamber of Mines, mere destructive criticism was postponed to the setting forth of innumerable suggestions whereby the practical utility of the proposed measure might be augmented. Unfortunately, as Mr. Schumacher deplored on Wednesday, most of those suggestions were ignored, and the Bill, though an improvement on its original form, is still imperfect in many respects. However, it may be as well to withhold further comment until Parliament has finished with it.

THE CONSOLIDATED LANGLAAGTE REDUCTION WORKS.

(For descriptive matter, see over.)



1. View of the Consolidated Langlaagte new mill from the north-west.
2. The sorting and crusher station, showing elevator belts from concrete ore-bin and main incline conveyor to mill.
3. Mortar box floor, showing open-fronted mortar boxes.

THE CONSOLIDATED LANGLAAGTE REDUCTION WORKS.

A Modern Plant on Tried and Conservative Lines—Solidity, Convenience and Efficiency Aimed at—Description of the Several Units.

"In the designing of our reduction plant," said Mr. J. Munro at the annual meeting of the Consolidated Langlaagte Mines, Ltd., the other day, "our engineers have made use of the best information available as regards the latest Rand practice, and, while it includes nothing of an experimental nature, the plant will compare favourably, from the point of view of efficiency, with any on the fields." An inspection of the new plant, which is now practically completed, abundantly bears out what Mr. Munro has said briefly and modestly in a very few words, and it may be doubted if there is any other plant on the Rand, even the most modern, which is better adapted to the work expected of it from an all-round point of view than that of the Consolidated Langlaagte. There is no doubt as to what it will do when in full running order, for everything has been designed and constructed upon well-understood lines, and nothing has been done tentatively, even in small matters.

Sorting and Crusher Station.

The ore from all the shafts on the property will be conveyed by electric haulage to a main receiving bin, which is located midway between the mill and the sorting and crusher building. This bin is built of ferro-concrete below the tram-line level, and delivers through shoots on to three incline elevator belts. The elevator structure is shown in an accompanying illustration. Four belts are provided for, but only three will be run for the present. No separation into coarse and fines is made at any of the headgears, so that all the ore from the mine, unclassified, will be conveyed by the elevator belts to the trommels at the head of the sorting belts. A sizing will take place here, the fines going to a cross belt below and the coarse being fed on to the sorting belts, after the usual preliminary washing in the trommels. There are three of the latter, of course, one for each sorting unit. From the discharge end of the trommels the sorting belts rise on the incline for a short distance and then run on the level for the remaining distance. They are 50 feet between centres, and of this length about 30 feet is available for sorting purposes. The waste rock is dropped through shoots into a couple of waste bins below, while a third bin, near the discharge end of the belts, is used for receiving mill pebbles. The waste rock is trammed from the waste bins to the dumps, while the mill pebbles are discharged at stated times on to a cross belt, which, like that receiving the fines from the trommels, delivers on to the main incline belt to the mill. The sorted rock is delivered into jaw crushers, 39 inches by 17 inches, and thence on to the same cross belt which intermittently receives the feed from the mill pebble bins. Each sorting and crushing unit has its own group of motors. In one of the accompanying illustrations the station is shown viewed from the N.W. The structure at the right side of the building is that in which the incline conveyor belts from the main receiving bin discharge into the trommel hoppers and where the trommels themselves are located. The whole building is of steel, the bins of timber, steel lined, and the floor below of concrete.

The Battery.

The fines and crushed ore from the sorting and crusher station are delivered, by the two cross belts referred to, to a main incline conveyor belt, which rises to the topmost floor at the centre of the mill building. This belt runs along the western side of the station, and its housing is clearly shown in one of the illustrations herewith. The ore is delivered to a shuttle belt running on a carriage over the mill bin at the end of the main incline conveyor. The mill bin is of steel framing with timber flooring solidly covered with steel sheeting. It has a capacity of 3,000 tons. At the west end of the mill a pebble bin is constructed adjacent to the building, and when the conveyors are running pebbles, the latter are delivered by the shuttle belt to a shoot which feeds directly to this bin. Thence the pebbles are taken by trucks into the tube mill house and fed to hoppers which discharge into Schmitt feeders.

The battery has 100 stamps, each weighing 1,900 lbs., arranged in units of 10 for driving purposes, with five cams to a shaft, and a single motor drive for each pair of shafts. There are three king-posts to each unit of 10 stamps, instead of four, as at Randfontein; but, as will be seen in the picture, these posts are extremely solid, as indeed is the whole timber framing of the battery. The framing is supported on massive concrete foundations, of similar design to those at the Randfontein Central, and having a tunnel from end to end, within which the anchor bolts are conveniently reached.

The mortar boxes are of the modern open-fronted type, while the stamp heads are of the long design usually adopted in modern batteries. The feeders are of the belt variety known as "Comet." The mortar box and cam shaft floors are unusually roomy, and the whole building and machinery are models of what such a combination should be, every requirement for facilitating repair work and operations generally being carefully provided for. The mill supply tanks are situated immediately at the back of the structure on steel supports, as shown in our illustration.

Tube Mill Plant.

There are 10 tube mills to the 100 stamps, the ratio being, therefore, the highest so far reached in Rand practice. Each tube mill is 16 feet by 6 feet, the length being shorter and the diameter greater than usual. The mills are erected at a low level, well below the ground line in fact, and the pulp from the mortar boxes, which are well above it, is thus enabled to flow by gravity to the cone classifier and dewatering plant connected with them. The necessity of pumping and the irregular rush of pulp to the cones which results from this practice is thus obviated. There is one primary cone to each tube mill, and a secondary safety cone, for each pair of tube mills, erected between each pair of primary cones. The overflow from the two primaries goes to the secondary cone of the circuit; the underflow of the secondary is returned to the primaries, and its overflow to the sands plant. The underflow from the primary cones passes through the tube mills to the amalgamated plates, four to each tube, in pairs, back to back, and 5ft. 3in. by 4ft. in area. The pulp flowing from the plates is conveyed by concrete launders in the floor to a main launder leading through into the pump house, and is thence pumped back to the primary cones at the head of the tube mill circuit. From the mill bins, therefore, to the return pumps in the tube mill circuit, everything moves forward by gravity only. The final pulp overflowing from the secondary cones flows along a launder to the pump house, whence it is elevated through a height of 65 feet to the upper level of the sand and slime classifier plant. There is only one entrance from the tube mill building to the plate house, and only one from the latter to the clean-up and smelting-room. There is no exit except by the same way, and thus the fullest protection is afforded against the entry of unauthorised persons to any section of the gold collecting department. The clean-up and smelting-room is supplied with the usual plant and apparatus, and is a spacious and conveniently-arranged place, divided from the plate compartment, upon which it looks down by an extensive grille.

The Pump Houses.

The pump houses, one in which are located the pumps for the tube mill circuit and the other in which are the pumps elevating the final pulp to the classifier plant, are situated one on either side of the clean-up and smelting-room, on the southern side of the plate house. In each are erected a pair of Robeson-Davidson pumps, of which one is intended as a stand-by. Here, as in all the other portions of the mill, the various units are driven separately by motors.

The Sand Plant.

The final pulp from the tube mill plant, after being pumped through a height of 65 feet, as already explained, flows to a series of nine cone classifiers, six of which are primaries, and three secondaries. Each secondary, therefore, takes the underflow from a pair of primaries. A thorough washing of the sand is effected in these cones. From the secondary classifiers the overflow goes to the slime plant and the underflow to the distributors of the sand collecting tanks. There are three collectors, and the overflow is finally passed over a set of four return sands cone classifiers, which receive also the overflow from the first series of classifiers as it goes on its way to the slime plant. The underflow from these return sands is passed to the pump pit for re-elevation, while the overflow goes along a launder to the slime collecting tanks. It is hoped to be able to divide the mill pulp finally into a sand product comprising 40 per cent. and a slime product comprising 60 per cent. of the whole, the ratio of slime to sand being thus unusually high. With the tube mill ratio adopted and the careful system of classification in vogue, this end will doubtless be fairly closely attained. The sand from the collecting tanks, which are built immediately around the base of the steel structure upon which the classifiers are erected, is delivered to three cross conveyor belts per tank, and thence to a main conveyor belt to the Blaisdell distributor. There are twelve 40ft. treatment tanks in two rows of six each.

The slime plant, which was hurried on to practical completion some time ago, in order that the large stock of accumulated slime might be conveniently taken in hand, is partly old and partly new. There are, in addition to the collecting tanks, fifteen 50 ft. and three 70ft. treatment tanks, with a combined capacity of 22,000 tons per month. One 50ft. and one 70ft. tank are still to be erected. The extractor house and pump house, connected with the cyanide plant, are of the usual kind and do not call for special description.

The structural work was supplied by the following well-known firms:—Crusher and sorting house, Messrs. J. & R. Niven (A. & J. Main, manufacturers); mill and bins, Messrs. Baerecke & Klendgen (Jno. Lysaght, Ltd., Bristol, manufacturers); tube mill house, W. Bain & Co. The battery parts, comprising mortar boxes, etc., were furnished by Messrs. Fraser & Chalmers, the tube mills by Messrs. S. Sykes & Co., the crushers by Messrs. Baerecke & Kleudgen (Amme Giesecke & Co., manufacturers). The motors are largely by the A.E.G., and sand pumps from Messrs. Fraser & Chalmers. The entire work has been under the direction of Mr. J. Kelly, as Construction Engineer, the drawings being prepared at the head office of the Barnato group, the Mechanical Engineer being Mr. A. D. Newman and his assistant Mr. E. W. Hutt.

THE RECENT COMPANY MEETINGS.

A Tone of Moderation and Confidence—Unavoidable Errors of the Past—Knowledge Acquired of Newer Conditions.

The series of events which culminated in the decision to hold the statutory meetings of various Rand companies at a later date than usual this year have, also, lent additional interest to the speeches from the chair, and, generally speaking, the note that has been somewhat prominent in all of them has been one of studied moderation and confidence. At the Rose Deep meeting, Mr. H. Eckstein remarked:—"Gentlemen, I propose to follow the advice given to chairmen at a recent meeting of the Central Mining and Investment Corporation, Ltd., in London, namely, not to be too eager to make forecasts, so as to avoid being hauled over the coals, and disappointing shareholders in the event of unforeseen circumstances preventing the fulfilment of promises which have been made in the best of faith." The fact that many promises made, as Mr. Eckstein truly says, "in the best of faith," have not been fulfilled has been used by those critics of the industry who regard it mainly, if not entirely, from the Stock Exchange point of view, to throw mud at everything and everybody connected with it.

The common opinion that the mining houses are not indifferent to the speculative opportunities afforded by the share market has led to the assumption that purely economic considerations are merely of secondary importance in the management of Rand mining ventures. There is a difference between taking a fair advantage of one's opportunities, however, and deliberately working to bring these opportunities about, and, although it is easy enough to demonstrate that mistakes have been made and rash promises indulged in, it would be extremely difficult to bring forward sufficient circumstantial evidence to prove that they were anything but errors of judgment. Mr. Eckstein's explanation of these mistakes is genuine enough. "You will have gathered," he said at the Rose Deep meeting, "from the various points on which I have just touched, that, as the mining industry expands so the problems with which it is confronted multiply, and many of the schemes which are now occupying our attention, and which almost invariably involve considerable expenditure, were not thought of a few years ago. This explains to a great extent the discrepancy between the results obtained by the enlarged company and those forecasted at the time of the amalgamation of the old Rose Deep and the Glen Deep. The difference lies in working costs, and in the fact that the amount of profits available for distribution had to be curtailed to meet certain requirements on capital account which were not contemplated when the consulting engineers worked out the figures contained in their report of August, 1909." Little need be said about working costs, because, with the fluctuating and uncertain character of the aboriginal labour supply, no safe prediction can be made as to what the operations dependent upon it are going to cost from one month to another, so to say. Capital expenditure estimates are quite another matter, and it is much to be regretted that some very inadequate estimates have been made under this heading by engineers, some of whom have been men of the widest experience.

The larger mining methods adopted of recent years in order to meet the necessities of low grade mining in the deeper levels are surrounded by conditions which were not sufficient calculated upon by those only accustomed to the mining undertakings of earlier days and other regions. Since there were no other sources of acquiring a full knowledge of the probable effect of these conditions, it has had to be gained experimentally at the expense of the shareholder. A tolerably high price has been paid for the experience gained in this way, but it has probably been well worth the money. The important fact is that the conditions and requirements of large scale low-grade mining operations on the Rand are now fairly well understood, and there will be little reason, therefore, and less excuse for blundering in the future. The only really uncertain factor is the unskilled labour supply, but the experience gained in this direction, also, since the repatriation of the Chinese miners, has not been valueless. Efforts have been made, and are now being continued, with some success, to obviate this difficulty as far as possible. The embarrassing positions created by the inadequate calculations and excessively sanguine estimates of the past have had an educational influence which may easily be noted in the speeches delivered from the chair at the various company meetings held this year, and which will doubtless be in evidence in those which are now in preparation. There is, as we have remarked, an obvious tone of moderation and well-founded confidence in them which cannot fail to be noted, and which should go far to reassure shareholders and investors,

PROMISE OF THE FARTHER EAST RAND.

Seven Mines Earn 20 per cent. of Rand Profits—Payable Ore Reserves, Eleven Million Tons.

Although it cannot be said that the centre of gravity of Rand industry has shifted from the central section to the farther East Rand, it is quite true that the area east of Boksburg is becoming each year a very much more important factor of Rand industry, and that it will continue to assume increasing importance is beyond doubt. Some years ago this section of the gold fields was described as a "second Rand" in itself. This statement is scarcely an exaggeration, for in the course of time the huge blocks of claims lying on the farms Rietfontein, Witpoort, Brakpan, Benoni, Modderfontein, Geduld, Springs, Klipfontein, Welgedacht, Grootvlei and Daggafontein will in all probability be producing almost as much gold as the central Witwatersrand. Most of these areas are still in the very infancy of their development; in fact, large blocks are untouched, and the working of these mines at their maximum capacity will probably be contemporaneous with the exhaustion of all the outcrop mines of the central section, and not a few of the deeper levels. It is not, therefore, to be wondered at that at the present day public attention is, to a large degree, rivetted on the farther East Witwatersrand and the great mines which are situated therein. A few years ago the New Kleinfontein, New Modderfontein and Van Ryn were the only three producers east of Boksburg—excepting, of course, the Nigel, still somewhat of a problem to geologists, and situated far to the south-east.

April Returns.

Contrast this with the records of production and profit-earning for the month of April last, when seven "Farther East" mines were producing, with 815 stamps and 29 tube mills at work, recording a production of £364,299, and a profit of £161,384. In order more clearly to establish the present-day importance of this Farther East section, it may be well to state the actual figures for these mines. They are as under:—

Mine.	Stamps.	Tube Mills.	Tons Milled.	Output.	Profit.
Benoni Cons. ...	45	3	17,600	£18,571	£776
Brakpan Mines ...	115	6	48,173	74,098	16,922
Geduld	50	2	14,050	18,486	4,101
Modder B.	80	5	30,900	60,734	31,909
New Kleinfontein ...	220	—	38,900	54,745	16,012
New Modderfontein...	180	7	43,620	87,465	39,148
Van Ryn	125	6	38,650	50,200	22,513
	815	29	231,893	£364,299	£161,384

For the whole Witwatersrand the output from 2,059,562 tons milled was £3,002,140, the profit declared being £1,005,920, so that the Farther East section contributed in round figures 12 per cent. of the output and 16 per cent. of the profit earned, the ore milled being a little over 11 per cent. of the total. The achievements of this Farther East section are of additional interest when considered on a unit basis. Thus:—

	Recovery per ton. s.	d.	Costs per ton. s.	d.	Profit per ton. s.	d.
Benoni	21	1	19	11	0	11
Brakpan	30	6	17	7	12	10
Geduld	26	4	20	5	5	10
Modder B.	39	4	18	2	20	8
New Kleinfontein ...	28	2	19	6	8	3
New Modderfontein ...	39	10	21	8	17	11
Van Ryn	26	0	14	10	11	7

It may be here pointed out that the average recovery for the whole Rand in April was 28s. 6d. working costs, averaging 19s. per ton, and profits 9s. 8d. per ton. It is therefore clear that this Farther East portion of the Rand is doing quite as well, ton for ton, as the Central and Western sections, if anything doing better, and this despite the flatness of the Reef and the mining difficulties incidental thereto. Particular attention may be directed to the excellent high grade returns of the two large Central Mining producers in this locality, the New Modderfontein and Modder B., each of which recovered over 39 shillings per ton of ore milled. The Modder B.'s profit is at the rate of over a sovereign per ton, and the New Modderfontein's close on 18 shillings.

A Progressive Area.

In April there were 90 stamps idle on these producing mines, 45 at Brakpan, 35 at the Van Ryn, and 10 at Benoni. The latter property is now closed down, but there is, of course, the probability of the concern returning to the producing list in conjunction with the Apex. Not only the Brakpan and the Van Ryn are capable of substantially larger returns, but a programme of expansion has been laid down for each of these properties. In our last issue we outlined the salient features of the progressive programme to be carried out at Geduld. The Modderfontein mines, as well as Brakpan, have been laid out with a view to much increased returns, and apart from the mines producing at present, the Modderfontein Government Areas, Van Ryn Deep, Modder Deep Levels, Rand Collieries, Van Dyk Welgedacht, East Rand Mining Estates, and other propositions will swell the output in the not far distant future. The Van Ryn Deep indeed is expected to enter the productive list in about 12 months' time, the initial plant ordered having a capacity of 40,000 tons per month. The shafts at the Modder Government Areas, Modder Deep Levels, and Rand Klip are close on the Reef, and in regard to this latter property an article appears elsewhere in this issue dealing with the position there. It is known that in addition to the Benoni-Apex fusion scheme, other amalgamation projects concerning ground in this locality are under consideration, having as their object the concentration of mining operations, and the hastening of development and production. During the next decade this Farther East Rand gold field is to witness tremendous expansion, and this in an area which a few years ago was an unproven and almost unknown quantity in Rand mining.

The Ore Reserves.

As further evidence of the great potential value of this area, it may be remarked that at the end of the year the ore reserves in the mines totalled eleven million tons, made up as under:—

	Tons.	Dwts.
Benoni	606,839	6·56
Brakpan	1,925,346	6·73
Geduld	607,300	8·18
New Kleinfontein ..	1,146,531	7·49
Modder B.	2,355,700	7·5
New Modder	3,341,830	7·6
Rand Collieries ...	371,200	5·375
Van Ryn Deep ...	603,716	7·17

French Rand G.M. Co., Ltd.

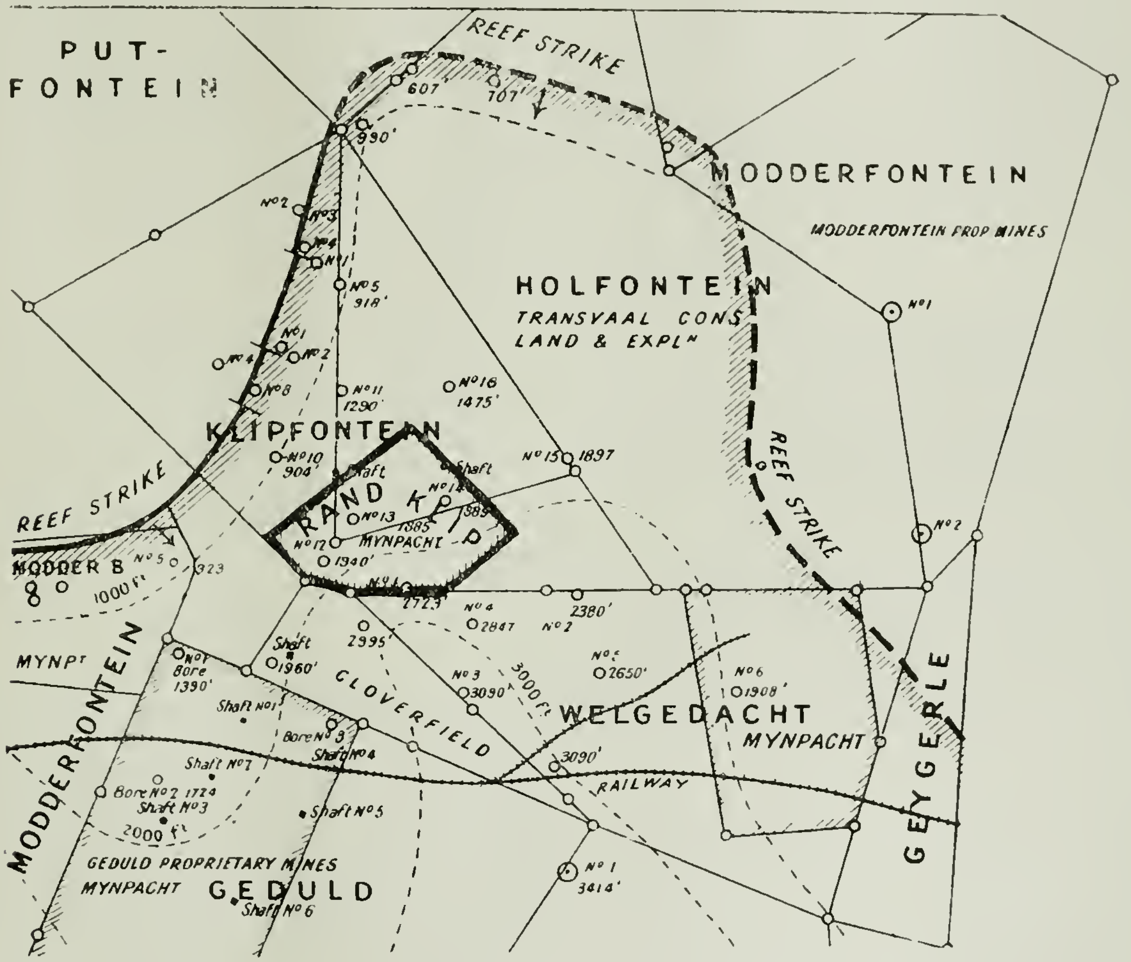
The annual meeting of the shareholders in the French Rand G.M. Co., Ltd., was held this week in the Corner House Board Room, Mr. H. Eckstein presiding. The chairman pointed out that the expenditure during the year had exceeded revenue by £4,356; maintenance, caretaking, and licences accounted for £1,655, out of a total expenditure of £7,820. Mining operations still remained suspended, and the directors had no fresh scheme to suggest at present. The report and accounts were adopted, and the retiring directors and auditors were re-elected.

Mines of the Witwatersrand.

XVIII.—RAND KLIP, LTD.

Eastern Shaft Almost on the Reef—Auriferous Leaders Encountered—Boring Results Recalled—The Pioneer of a Little Known Section.

On Sunday last the eastern shaft of the Rand Klip, Ltd., had reached a depth of 1,793 feet. Sinking has been proceeding at the rate of about 90 feet per month, and it is confidently anticipated that within the next three or four weeks the reef will be encountered. The shaft is now passing through quartzite containing interbedded pebble leaders, and everything points to proximity to the true banket formation. Some of the pebble leaders penetrated have been assayed and have given traces of gold.



Map Showing Position of the Rand Klip Property in Relation to Surrounding Mines.

Position of Shaft and Boreholes.

The position of this shaft is about midway between the No. 13 and No. 14 boreholes, and slightly nearer the outcrop or sub-outcrop, so that, theoretically, the reef should be struck at a lesser depth than it was encountered by the diamond drills. The No. 13 hole was sunk at the extreme south-west corner of the Klipfontein Estates (1,000 feet north of the south-west beacon), and this in 1903 encountered reef at 1,885 feet, the thickness being 3 feet 2½ inches and the assay value low at 2·2 dwts. per ton. In 1904 the Rand Klip Company decided to test the eastern part of the farm, and accordingly the No. 14 hole was sunk half-way between the south-west and south east beacons of the Klipfontein Estate, and on joint account with that company. This bore encountered reef in March, 1905, at a depth of 1,886 feet, showing 10·6 dwts. over 35 inches. The fact that each borehole came on reef matter at practically the same depth is of particular interest and seems to point to an unbroken stretch of ground. As to values, although the No. 13 bore gave poor results the ore drawn from No. 14 was very satisfactory, both as regards width and assay value, and it seems quite likely that the shaft will encounter a quite profitable section.

Other Boring Results.

It may here be of interest to record the results secured by other boreholes. The chief drillings were carried out by the Rand Klipfontein Company, which previous to the war had sunk three prospecting shafts. The following are the principal boreholes recorded in addition to those of the No. 13 and No. 14 holes already stated.

Bore No.	Situation.	Depth at which Reef was encountered. Feet.	Reef Width. Inches.	Reef Value. Dwts. per Ton.
10	2,100 feet from Outcrop.	904	6	11
11	——	1,290	4	5
12	——	1,940	33	6·3
15	Extreme S.E. corner Klipfontein Estate.	1,896	4	9
16	——	1,472	23½	4

Much importance cannot of course be attached to the data as to the reef values and width obtained from the diamond drill cores, but at the same time the results secured have indicated the existence of a promising auriferous section and the borehole data have been of great value in determining the general "lay-out" of the shafts.

THE DEVELOPMENT SCHEME.

The west shaft was sunk to a depth of 555 feet and discontinued in January of last year. It is understood that there is at present no question of re-starting this shaft, as for the time being all energies will be concentrated on development from the eastern shaft as soon as the reef is cut. It seems to be thought that as Klipfontein is a little exploited section it is best to entail the expenditure of only one shaft and to test the values therefrom before continuing the second.

A CHEQUERED CAREER.

The Rand Klip Company has had a somewhat chequered career, but it is to be hoped that the striking of the reef in the eastern shaft will inaugurate a new epoch for the company. The sinking of two shafts of five compartments each, fitted with steel instead of the usual timber framing, was estimated to cost some £220,000. A considerable amount of such total has already been expended as in August, 1905, Chinese labour being obtained, a start was made with sinking; but work was stopped March, 1906, owing to cash resources having been reduced to a low figure and the conditions of the market not admitting of the carrying out of a consolidation project and raising of further required capital, quite £130,000 being required to complete the sinking and equipment of the two shafts. The principal bores were made by the Rand Klipfontein Company, which prior to the war had sunk three prospecting shafts. All shaft-sinking was stopped about 1898, then resumed in 1899 until the war stopped operations; subsequently some further work was done, but for about two years prior to the amalgamation of the Klipfontein Estate and Rand Klipfontein Company no further shaft-sinking was effected.

FINANCES, AREA AND OUTLOOK.

The capital of the Rand Klip Company amounts to £475,000, of which £432,336 is in issue, and the property consists of the unproclaimed farm Klipfontein No. 22, in extent 3,451 morgen 82 square roods. At the end of June last the Company carried a balance forward amounting to £125,908. Presiding at the eleventh ordinary meeting in September last, Mr. Wm. Dalrymple anticipated that "the Reef should be intersected before the end of the current financial year." It is a practical certainty that this expectation will be realised, and should encouraging results be secured in the vicinity of the shaft—and there are good reasons for thinking that they will be—interest in the extreme, and as yet little known, north-eastern section of the Witwatersrand should receive a stimulating impetus. We here attach a map of this portion of the Rand showing the position of the Rand Klip mine in relation to surrounding properties.

Sheba and Rosetta.

The following are the results of the May working of the Sheba and Rosetta mines:—Sheba: Mill ran 29 days; crushed 6,310 tons of ore; yield, 2,985 fine ozs; estimated profit for month, £3,795, after allowance for development and head office charges. Rosetta: Crushed 291 tons, yielding 172 ozs. fine gold.

Village Main Reef: Annual Report.

The report of the Village Main Reef Gold Mining Company, issued this week in London, for the year ended on the 31st December, 1911, shows a profit of £401,106. The Board recommends an interim dividend of seven shillings per share. The report states that the labour supply has been unsatisfactory, but is gradually improving.

Village Main Reef: A Quarter's Operations.

The report on the working operations at the Village Main Reef for the three months ended the 31st of March states that on development work 953 feet were driven, risen and sunk. The reef disclosures were as follows: Main Reef Leader, distance exposed, 321 feet; width, 13 inches; assay value, 15·8 dwts. South Reef, distance exposed, 353 feet; width, 8 inches; assay value, 20·2 dwts. The estimated payable tonnage of ore exposed by drives, etc., was 52,361 tons. The reduction and treatment plant treated 98,070 tons, from which 46,786·149 ounces of gold were obtained. Revenue from gold for the quarter amounted to £177,467, from gold taken from reserve £20,000, and profit from treatment of accumulated slimes £2,436, making together a total of £199,903. Working costs, including profits tax, estimated at £5,672; income tax, French and fiscal taxes, and all head office expenses together, £7,925, amounted to a total of £119,381, or 24s. 4·2d. per ton. The profit for the quarter was £80,552, or 16s. 4·9d. per ton, which is allocated as to 11s. 10·1d. per ton from current treatment, 4s. 0·9d. per ton from gold taken from reserve, and from treatment of accumulated slimes 5·9d. per ton. Following the decision to dicontinue carrying reserve gold, a special declaration of the reserve at the 31st of March, 1912, amounting to £5,000, was made. In future actual monthly results will be declared. The native labour conditions are improving, resulting in increased profits.

Kolmanskop Diamond Mines, Ltd.

The output of diamonds from this company's property at Luderitzbucht for the month of May was 9,789 carats.

A New Apparatus for the Coking Tests of Coal.*

By R. LESSING.

The author discusses the methods for the estimation of volatile matter in coal and their accuracy. He classes the sources of error of the crucible test in two groups:—1. Factors tending to increase the "volatile" value. (a) Burning of coke in the more or less oxidising atmosphere. (b) "Spitting" of coaldust due to explosive character of gasification of some coals or rush of currents produced by the flame. 2. Factors tending to decrease the "volatile" value. (a) Insufficient coking of the coal. (b) Secondary catalytic decomposition of volatile products on the walls of the crucible. (c) Decomposition of volatile products by radiation in the waste spaces of the crucible. (d) Deposition of carbon during coking by too rapid primary decomposition of volatile coal substance. He states that practically the only point on which uniformity was so far desired and attempted was the quantitative determination of volatile matter, too little consideration being given to the properties of the coke obtained. The author devised an apparatus which will show more markedly the difference in the coke produced from various coals, and which at the same time permits us to observe the process of carbonisation in individual cases. Its principal object is to do away with the waste space above the coal in the ordinary test. Instead of the crucible he uses a cylindrical tube of about 10 mm. internal diameter made of quartz glass or platinum. One gramme of powdered coal is placed into this tube and a quartz glass piston introduced, which rests upon the coal and the weight of which can be altered. The tube is placed into an outer tube of special design which is electrically heated. The author observed very marked differences in the resultant coke when treating various coals in his apparatus. Photographs of cokes obtained from 20 different coals are shown, of which the analyses are given. Another diagram compares the cokes obtained by the author's method with those obtained in the platinum crucible. A special feature of the apparatus is the possibility of identification, as every coal will invariably assume the same shape and structure of coke when treated in the apparatus. The quantitative results obtained in the author's apparatus and those according to the "American" method are compared. The author claims usefulness of the apparatus for the study of a carbonisation and for comparison and identification of coals.

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* Abstract of a paper read before the London section of the Society of Chemical Industry.

THE "GROUPS" AND VENTILATION.

Large Number of Fans Employed—Others to be Erected—Interesting Figures as to Sizes and Capacities—The "Square Deal" Underground.

The amalgamation of Witwatersrand mines has enabled the controlling groups to carry out many improvements in technical practice, not the least important of which has been the concentration of work in and around main shafts and crusher stations. It is now freely admitted that the Rand is possessed of too many shafts, and one of the first alterations carried out upon amalgamation at the Crown Mines and at other large united properties was the gradual closing down of the older and smaller shafts and concentration of hoisting operations in and around the newer shafts of large capacity. As a consequence a number of old shafts have been closed down right along the Rand. They are no longer required for purposes of hauling, but the majority of them are maintained in a fair state of order and preservation, and may at some time prove valuable in cases of emergency.

One Consequence of Amalgamation.

Under normal conditions, however, these shafts should prove of marked service and usefulness. One advantage of amalgamation which has as yet not secured the recognition it merits has been the improved ventilation conditions resulting from fusion of adjacent mines. Incline shafts have been continued into deeper level ground, and long drives have been carried east and west throughout the properties. Naturally, marked improvements have been recorded in both the quantity and quality of air circulating throughout the workings. In regard to idle or little used shafts, the Simmer Deep has made use of the Rudd or central shaft as a water and ventilation vertical. A large Sirocco fan has been installed, and the shaft can be sealed over, thus making the Milner and Clement downcast shafts.

Similar methods are to be pursued, so we understand, at other mines. There have been brought into amalgamation schemes a number of antiquated shafts sunk in the late eighties and early nineties, which are useless or practically useless for purposes of modern ore hoisting, but are of value in securing ventilation.

What the Groups Have Done.

It is unquestioned that right along the reef ventilation has been greatly improved during the past year or two, and the general conditions under which underground workers labour have been substantially bettered. Sprays have been universally adopted, much more attention has been accorded to the study of air currents and "bratticing," and fans have been adopted right along the reef. A few facts and figures regarding the larger ventilating appliances in use on Rand mines to-day should prove of much interest There are eleven large fans in use in the mines of the Central Mining and Administration Group, eight being of Sirocco type and three of the Rateau pattern. A ventilation scheme for the Geldenhuis Deep is now being gone thoroughly into, and it is probable that another fan will be erected at this mine very shortly. The following interesting table sets forth the make, sizes and capacities of the fans in mines under Corner House control:—

Mine.	No. of Fans.	Make of Fans.	Diameter. Inches.	Capacity. Cub. ft. of Air per Minute.
City Deep	One	Rateau	97½	75,000
City and Suburban ...	One	Sirocco	77	88-100,000
Crown Mines	One	Sirocco	105	250,000
Durban Rood. Deep	One	Sirocco	45	50,000
Ferreira Deep	One	Sirocco	40	30,000
Nourse Mines	Two	Rateau	100	75,000
Do.		Sirocco	77	100,000
Robinson	One	Sirocco	63	75,000
Rose Deep	Two	Rateau	88	80,000
Do.		Sirocco	35	25,000
Village Deep	One	Sirocco	126	288,000

The Ferreira Deep fan, it should be noted, is only partly erected. The volume per minute stated for the Village Deep Sirocco is the present capacity of the fan. This installation ventilates the Village Main Reef as well as the Village Deep, with its Turf Mines Deep level section. In the mines of the Consolidated Gold Fields group two large fans are working, one at the Robinson Deep and one at the Simmer Deep, whilst another large fan is in course of installation at the Jupiter. The Knights Deep-Simmer East properties are about the best ventilated mines of the group, and artificial ventilating appliances are not needed there. In addition to the large fans, the Gold Fields mines are equipped with a number of smaller appliances for improving the volume and quality of underground air. On the East Rand Proprietary Mines two large ventilating appliances are employed. In the Angelo a Sirocco fan has been installed, and a Barclay fan is at work in the Cason. Two other smaller portable fans for local ventilation have been put in in the East Rand workings, and it is proposed to employ others. In the Goerz Mines no large fans are installed, but recently two of the three small machines have been employed in isolated places where the air was not good in the Geduld and Princess Estate. In the Barnato mines a fan has been installed at the New Rietfontein, and the installation of another to ventilate the workings from the deep incline shaft being sunk in the Witwatersrand Mine is receiving the consideration of the Johannesburg Consolidated Investment Co.'s Engineering Department. The Neumann group management is installing a large Sirocco fan at the east shaft of the Knight Central mine. As a matter of fact the ventilation here leaves little to be desired, and the fan installation is more in the nature of a safeguard than anything else. It is not probable that the fan will be in constant employment, but will be utilised as occasion requires. The General Mining and Finance Corporation are also quite alive to the advantages of efficient ventilation. In the Cinderella Consolidated a large Capell fan is employed, and two Stine fans are installed, one at the bottom of the vertical shaft and one at 3,000 feet.

Wanted; A Better Response.

The foregoing should be sufficient to demonstrate that the Rand is fully alive to the benefits of securing good ventilation—not that the Rand as a whole has ever had really bad conditions in this regard. Ventilating fans, as recently-issued balance sheets have shown, are costly appliances to install, but the controllers of the industry are evidently not going to allow any expenditure in reason to baulk their efforts to render the underground workings as healthy as human brains, machinery and finance can make them. It is to be regretted that the large sums of money spent by the mines in this regard have not met with an adequate response from underground workers in the shape of better labouring efficiency.

Zaaiplaats Tin Mining Co.

The following is a summary of May results:—Mill ran 27·5 days; tons ore crushed, 2,540; duty per stamp per 24 hours, 6·157 tons; average yield concentrates, 5·196 per cent.; concentrates won, 132 tons; average value concentrates, 68·2 per cent. tin; estimated working costs (including mining, milling, tramming, concentrating and drying of concentrates, but not including realisation costs), £3,300; total profit, £10,500 (not allowing for Government profit tax or head office expenses); total development, risen, driven and sunk, 473 feet; tons ore mined, 3,400.

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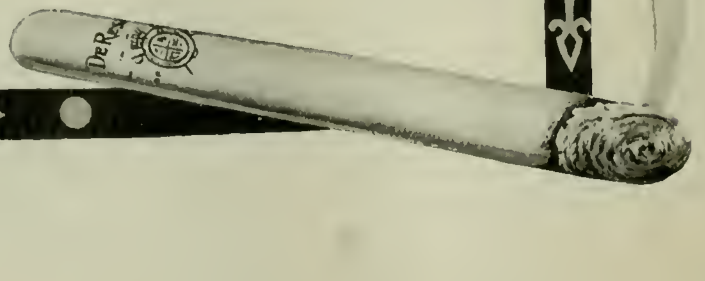

SYSTEMATIC HAND STOPING ON THE RAND.

A "Corner Stone" in the Knowledge of Mining.

[BY A CORRESPONDENT.]

PART I.

(a) Put a man to learn mining in a hand stope and at the end of two months if he is not entrusted with a stope of his own he will consider he has a grievance—yet there is quite a lot to learn in hand stoping. I believe there is such a thing as systematic (we will not call it scientific) hand stoping, and that a marked increase in efficiency would result if hand stopers were worked more systematically. There are, of course, many men on the Rand with an excellent knowledge of the general principles of hand stoping. They work systematically and can modify their system to the conditions, but if they were asked what system they were using or intended to use, they would give no definite answer. If pressed for an answer, they would be quite sure their questioner was a theorist pure and simple, because, though the best hand stopers work on a system, no one, to my knowledge, has ever gone into the subject thoroughly enough to classify or describe systematic hand stoping. Yet, considering the greatly increased cost of Kaffir labour and the tens of thousands of hammer boys engaged on the Rand, the subject must be well worth studying. I think every practical man will agree with me when I say the majority of hand stopers work without system, that is they put in a hole anywhere they think it will break the most ground. The shape of the faces determines the position of their holes—their holes do not determine the shape of the face, and what may appear strange is that, if they are men who have been some time at the work, no one can suggest any improvement in the position of their holes, as far as the quantity of ground they will break is concerned, and yet every hole may be in wrong from the point of view of a man who is looking a day or perhaps a week or a month ahead. One has only to listen to the School of Mines lectures on hand stoping and to see their diagrams and models to feel quite convinced that hand stoping has not been considered worthy of systematic study. Yet one cannot get away from the fact that hand stoping should be considered one of the corner-stones of the knowledge of mining. As long as the holes are not obviously too weak or too strong—and there are not too many "sockets" about—and as long as the angle of the face with the two drives coincides with what is considered correct in that mine, the average stoper is not bothered much by the bosses with regard to the system he uses, and yet the man who places his holes without thought of the morrow has no more chance against a systematic worker than a billiard player, who thinks nothing about the position of the balls for his next stroke, has against Roberts.

(b) The question of the angle which the face of a stope should make with the drives is an important one, and must be settled before the details of any system of breaking ground is discussed. Miners are by no means agreed on this subject. I have never heard the subject intelligently discussed. It is very difficult to discuss the subject. What is wanted is a set of definitions to start with. Terms are dragged in which have no definite meaning, though they are old enough to be thoroughly well defined, but every man seems to have his own idea of what they mean. You hear of "clifting," "breast stoping," "back stoping," "resueing," and "stoping by shrinkage." Even the "toe" of a stope is sometimes said to be at the bottom of a stope. No one seems to know of a correct definition of an overhand or an underhand stope, which, after all, are about the only two kinds of stopes of any importance. The others are simply modifications of them. The "toe" of a stope, I take to be, simply another name for the angle which the face of a stope makes with the lower level. The following remarks should be platitudes—they probably will be—before the Rand is worked out:—

(1) Underhand stopes should only be used where the dip is too steep for overhand stopes.

(2) In an overhand stope the angle of the face of the stope with the drives should invariably be such that the stuff blasted from any bench should clear (only just clear) the bench below it.

(3) The thickness of pillars over drives should depend on the length of time the drive will be required after the stope is worked out.

(4) No pillar under 15 feet thick is of any permanent value on the Rand to-day.

(5) Most of the pillars left on the dip side of a drive are not only unnecessary but also a great drawback to efficient stoping. Benches cannot be shaped as quickly as they are required when cutting under a pillar, and, as all benches should be shaped at the top and carried from the top to the bottom of a stope, the stope is bound to get out of shape.

(6) It costs the mine and the miner more than twice as much to leave a pillar under a drive than one over a drive, and the pillar under a drive starves the benches on the top of the stope.

(7) There is no safer place in a mine than on the dip side of a big pillar—*and that is where the drive is.* Why, then, should another pillar be cut not five feet below it? The safety of the drives rarely demands it, and if the hanging shears over the drive, it can be made safe much cheaper by modern pig-stys and timbering than by the expensive and inconvenient pillar.

(8) If you take the angle which the face of a stope makes with the level above it at 120°, then the angle—which the face makes in the lower level—is the complement of 120°, viz., 60°. That is, if the face is carried in a straight line from top to bottom—*but this should never be the case.*

(9) At about 30 feet from the bottom of the stope the angle of the face with the upper level should change from 120° to about 140°.

(10) This is very important, and is done by placing the best boys there.

(11) The object is to keep the "toe" clear of the stuff broken from the face while the boxhole is being sunk.

(12) Even in an underhand stope on a steeply-inclined reef the bottom 30 feet of the stope should be worked overhand, and though this is not easy to do unless the stope is started in the proper shape from the winze, it is vital to efficient working, even if the boxholes are put up from the drive in advance of the face.

(13) A line drawn through the corner of each bench will give the angle which the face of a stope makes with the levels.

(14) It may sometimes pay to keep the face of a stope parallel with the vertical lines of cleavage.

(To be continued.)

Brakpan Mines.

The following information is furnished with respect to the May output:—Stamps working, 130; running time, 29 days; ore crushed, 53,650 tons; tube mills working, 6; ore hoisted, 61,378 tons; ore from dump, 1,533 tons; waste sorted, 13·53 per cent.; fine gold declared, 20,821 ozs.; value declared £87,615, equal to 32s. 8d. per ton milled; working costs £47,298, equal to 17s. 8d. per ton milled; working profit £40,317, equal to 15s. per ton milled.

ECONOMICS FROM THE CHAIR.—I.

Points About the Mines, Taken from Recent Speeches at Annual Meetings.

THE concise and somewhat dry reports of consulting engineers and mine managers are usually subject to amplification and comment by the chair at the annual company meetings at which they are presented, and so much that deserves emphasis is left to be dealt with on these occasions that a careful perusal of chairmen's speeches not infrequently serves to throw useful light on facts and figures that might otherwise fail to receive the attention they deserve. This year, as we have indicated in another part of this issue, speeches from the chair are of more than ordinary interest, in view of the fact that serious and to some extent well-founded criticism of the mining industry has to be replied to, directly or indirectly. The following are notes regarding some of the more important matters referred to at the various annual meetings:—

ROSE DEEP.

The cheerful view taken of the prospects of the mine last year by Mr. R. W. Schumacher have been borne out by the marked improvement in the results achieved during the past year. While the dividend has been maintained at the previous rate of 40 per cent., a sum of £50,499 was appropriated out of profits on account of capital expenditure, which amounted to £81,055. The net liability at the close of the year was £4,856. An increase of the ore reserves by 116,686 tons to 3,670,160 tons, or a five years' supply, has left values practically undiminished. As showing the real effect of an ample labour force, it is pointed out that profits increased from £28,600 for the quarter ended 30th September to £35,000 for the quarter ended 31st December. The necessity for a thorough exhaustion at the outset of all ore bodies over the payable limit, if it can be economically done, is shown by the statement that work in the upper levels of the north section has had to be carried on with great care and on a limited scale so as to avoid losing any appreciable portion of it through caving. Concentration and centralisation of underground operations have been aimed at by the adoption of variously carefully thought out working schemes, and in this matter the Rose Deep is following the line of policy which is being largely favoured nowadays upon the Rand. The question of compensation in connection with the failure of the Rand Mines Power Supply Company to furnish the stipulated quantity of air has been amicably settled, and the board very properly appreciate the initial difficulties attending a vast undertaking of that nature. It is gratifying to learn that the efforts of the management, in common with others, are being directed towards the problem of killing not only the dust created by drilling, which is already being done with a considerable measure of success, but also of laying the dust caused by blasting. "Indications are not wanting," said Mr. H. Eckstein, "that some effectual remedy will have been found before long, so that the current of air which artificial ventilation passes through the workings will only contain such infinitesimal quantities of dust as will do no harm to the underground worker, whether he be white or black."

WITWATERSRAND.

Since the close of 1911 there has been a marked improvement in the returns from the mine. It has been accomplished by mining rock more in keeping with the average grade of the mine. In a word, it has been achieved by cleaner mining, a policy which has entailed an increase in working costs, which have, nevertheless, been justified by the better results. "It is now recognised," remarked Mr. J. Munro, the chairman, "that low working costs are not always synonymous with the best economic results."

NEW PRIMROSE.

The bonus system, which was originated in 1906 as an addition to the normal dividend rate which was considered well within the capacity of the mine, has been abolished, and profits will in future be distributed solely in the form of dividends. Dividends amounting to 662½ per cent. have been paid since the formation of the company, and these, together with the bonuses referred to, make up a total distribution of 762½ per cent. The mine has now reached a stage when considerable fluctuations in grade may occur, and it cannot be expected that the present high level of profits will be maintained for an indefinite period. Further investigation of the older parts of the mine shows that large quantities of ore were left undisturbed at the period when the mine was first worked. Though some of it was then considered too poor to be mined it is now considered valuable reef. Areas of high-grade ore have also been discovered which will add both to the life and profit-earning capability of the New Primrose. It would be interesting to know what was actually the grade of the mine in the early days spoken of.

NEW RIETFONTEIN.

The geology of the dyke appears to be still something of a puzzle to the company, for although boring operations were carried on to a considerable extent during the past year, it did not succeed in locating the reef to the south of the dyke. To judge from evidence collected in the neighbourhood by the Geological Survey, there is little likelihood of any reef being in existence to the south of the dyke, and the company has probably acted wisely in deciding to devote attention for the present entirely to the opening up of the reef-bearing area above the dyke, where there are 58 claims still untouched.

Manicaland Mineral Output.

The mineral output of the territory of the Companhia de Moçambique (Manicaland) for the month of April, 1912, was as follows:—Reef.—Mill: Gold won (fine gold), 137 ozs. 9 dwts. 14 grs.; tons crushed, 681; value, £577 7s. 4d.

Cotteswold G.M. Co., Ltd. (in Liquidation).

In the month of July, 1909, this company commenced to work the property formerly known as the Stanhope Gold Mining Company. The company was carried on until the end of that year, when it was obliged to suspend operations pending the raising of additional capital. All attempts to place the finances of the company on a satisfactory basis having failed, its affairs were placed in the hands of a liquidator early in 1910. Since then dividends, amounting to 11s. 7¾d. in the pound, have been paid. There have lately been rumours of a restart of operations.

MINING EXAMINATIONS.

Private individual tuition for Mine Managers', Mine Captains', Mine Surveyors', Mechanical Engineers' and Enginedrivers' examinations, Practical Mathematics and Electrotechnics. Correspondence lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings, Box 2061, Johannesburg.

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N'KANDHLA BANKET SERIES.

A Reply to Mr. David Draper's Condemnation of the Zululand Reefs.

[By "Ego."]

In a recent issue of the "South African Mining Journal" appeared an article from the pen of Mr. David Draper, F.G.S., entitled "The Future of the Banket Series in the Transvaal." In this article the writer states somewhat dictatorially that from N'Kandhla in Zululand to the Spelonken, from Wolmaranstad to the Lebombo, the banket series had been "thoroughly explored," and outside of the Main Reef and Rietfontein Series the conglomerates must be written off as a complete failure, and that all attempts to discover new lines of reef must be set aside as beyond the region of possibilities. In the present article I shall endeavour to show that this statement, as far as the Banket Series in the N'Kandhla district (Zululand), to which he indirectly refers, is concerned, is incorrect, both as regards the thoroughness of the prospecting and the economic value of the reefs. To the district outside of Zululand embraced in his pessimistic contribution it is not my intention to refer. The N'Kandhla banket series, or, as they are locally called, "Insuze Banket Series," were discovered as far back as 1894. Opinions vary very considerably as to whether they are correlative with any of the Witwatersrand beds or not. Many experienced mining men have stated that they are identical with the latter, and others argue the contrary. Assuming that the opinion of Dr. F. H. Hatch may be accepted on the subject, I quote from his "Report on the Mines and Minerals of Natal" (1910), in which he states: "It has been suggested that the Insuze conglomerates and quartzites are correlative with the Witwatersrand beds of the Transvaal; but there is no evidence in favour of this view, and no petrological succession can be established which at all resembles that of the Rand." And again he writes: "With regard to the former (conglomerates) an attempt has been made by some to correlate them with the Witwatersrand conglomerates. There is no evidence that favours this correlation. The resemblance is slight, and there are marked differences in the nature of the pebbles and of the associated rocks." Accepting Dr. Hatch's opinion, as quoted, to be correct, it may be taken that the Insuze (N'Kandhla) Banket Series is different from the Main and Rietfontein Series of the Transvaal, and comes within the category of unpayable and unprofitable outside series referred to by Mr. Draper in his article.

The Insuze Series was proved, within the first few months after its discovery, to extend for a distance of close on thirty miles along its strike, and prospecting along the line of formation was for a time fairly brisk, but this was confined in most cases to mere surface scratching and trenching. From then till now it has never been "thoroughly prospected." A lack of funds to carry out the systematic exploitation necessary was the rule amongst individual prospectors, and interest in the fields dwindled down until within eighteen months from date of discovery not a single prospector was to be found on the Series, and so it has been with one or two exceptions until a very recent date. The causes which led up to the abandonment of what promised to be a payable mining industry were many. The principal cause being that in the earliest days of the new find, the most promising portions of the Series were taken over for development by a well-known Rand financial house. The representatives of this firm secured about five square miles of claims along the reefs, and expectations were high of the result. For some unaccountable reason, however, within a few months from the time of securing their several options, and despite the openly-expressed optimistic opinion of their resident engineer, all options were cancelled, and the Insuze Banket Series was abandoned, declared unpayable and worthless; the Rand firms came, saw and condemned. If work of any magnitude was done during the time they were operating, it would not appear so bad, but throughout, beyond a little surface trenching, a shallow shaft here and there, and an odd short drive or crosscut, nothing was done to prove either the continuity or the value of the reefs. The workings of that time are still in existence and remain a monument to Randites' explorations in Zululand. It has been said that the firm in question spent from ten to twenty thousand pounds in Zululand at that time, and that it was worth it. Perhaps so. The principal explosive in use by their prospectors was "Club Whisky," the supply of which was not equal to the demand for it. It is claimed for this particular brand of explosives that it will enable the prospectors to see twice as much gold in the pan as there really is, but in this case it appears to have dissipated the gold contents of the rock altogether. Is this Mr. Draper's idea of thoroughly exploring the Banket Series from N'Kandhla to Spelonken? It is the only exploration by the "groups" that we have experienced in this part. Rightly or wrongly they branded the Insuze Banket Series as worthless, after a purely superficial examination, and the stigma has remained until quite recently. Some of the methods adopted by the prospectors employed by this Rand firm were really amusing. I was looking at some of the old workings the other day, and could not help admiring the thorough exploration of the claims upon which they were situated. The workings referred to were two shafts, one on either side of a stream. That on the west bank was sunk to a depth of about 25 feet on the reef, where water was struck, as might be expected, when it got to the level of the stream. Work was stopped at this point, and another shaft was sunk on the east side of the stream with the idea of draining the water from the west shaft. Unfortunately the stream running between upset this wonderful engineering feat, but the contractor or prospector got paid for his work, and the claims were declared unpayable. I was exploring an old crosscut driven to intersect one of those banket reefs recently. Evidently the man in charge of the work, who, bye the way, was highly thought of by his employeers, did not know banket from sandstone, as in this crosscut, he cut through a banket reef twelve inches in width carrying 6 dwts. of gold without knowing it. These are only two instances out of many that could be quoted to show how thoroughly the Banket Series of N'Kandhla were prospected in the early days with Rand capital, and what grounds there were at the time for condemning the series as being unprofitable and unworkable. This banket series is to-day almost the unknown quantity it was when first discovered, and it is hard to conceive anyone claiming that it has been thoroughly explored.

A few months ago portion of the Series was taken in hand by Mr. W. J. Edwards, an old prospector, with practical experience of many corners of the mining world. He went upon the theory that condemnation from the Rand was about the best recommendation that any Zululand mining proposition could have. Pegging out sixteen claims (equal to 200 Transvaal claims) on the precipitous slopes of the N'Tingwe range of hills, where the series outcrop, he started systematic development. The results so far are all that the most sanguine prospector could desire. A few words relative to this proposition—known now as the Somali Mines—may be of interest. From its topographical position no better or more ideal site for a mine could be found. For a depth of nearly 1,500 feet all development can be done by adit level. From the lowest level all ore mined can be delivered to any reduction plant necessary, which can be erected within 100 feet of the mouth of the adit. The saving of labour, therefore, in the hauling and handling of the ore will be reduced to a minimum. The lower slopes of the hill upon which the mine has been opened are densely clothed with timber suitable for mine props, etc. The most striking feature, however, of the whole proposition is the waterfall fed by the N'Tingwe River, and its tributaries, which passes right through the claims. This waterfall has a drop of about 400 feet, and carries sufficient water all the year round to supply the necessary power to run 100 stamps and over, and any other plant that may be necessary, thus reducing working costs to a very low figure. It has been estimated that expenses of development and mining, etc., will not exceed two pennyweights of gold. The reefs, of which there are three in number, are already being opened at four levels. Principal attention is being paid to the main reef, which is the centre one of the three. As a matter of fact there is not more than 60 feet between the three reefs. At the apex of the hill a shaft is being sunk upon the outcrop, and from this point to the lowest level being worked at present (1,000 feet) the reefs show considerably throughout. The main reef has a width of from 18 to 24 inches, and assays from 5 dwts. up to 1½ ounces. The South reef runs from 12 to 15 inches, and carries an average value of 5 to 6 dwts. Very little work has yet been done on the North Reef; it is from 24 to 30 inches in width, and carries gold throughout. A striking feature of this mine, and, I presume, of the whole of this Series is, that as the reefs are developed in depth the gold values increase; usually it is found to be the reverse.

In his yearly report on Zululand mining for the year 1894, Mr. J. Jervis Garrard, the then Commissioner of Mines for Zululand, expressed the opinion that, with proper development, at least one payable gold reef would be discovered in this Series; in fact, on the claims to which reference has been made above. It is pleasing to record that after varying vicissitudes and many years his optimism is being verified. The results achieved at the Somali Mines so far emphasise the absurdity of accepting the opinion, condemnatory or otherwise, of any engineer or geologist without proper examination and development of the property in question. Many millions have been won from the Main Reef Series of the Transvaal since it was condemned by gentlemen of world-wide repute in the mining world today. It is possible that some expert opinion carries as little weight or is as little thought of in Johannesburg as in Zululand. Those readers, therefore, who would wish to compare the ore of the Insuze Banket Series with that of the Main Reef Series of the Transvaal may do so at the office of the "South African Mining Journal." The writer has forwarded that journal samples of two of the reefs taken recently by permission from the Somali Mines, N'Kandhla.

Another Free State Diamond Mine.

It is notified that a portion of the farm Elandsput, in the Boshof district, has been declared a mine.

Ceylon Lydenburg Output.

The following is the output of the Ceylon Lydenburg mine for the month of May: Tons crushed, 735, yielding 548 ozs. fine gold, valued at £2,279. Total value of month's output, £2,279; estimated profit for the month, £1,550.

Glynn's Lydenburg.

The following is the output of the Glynn's Lydenburg mine for the month of May: Tons crushed 3,166, yielding 1,823 ozs. fine gold, valued at £7,725. Total value of month's output, £7,725; estimated profit for the month, £3,486.

Activity in the Koffyfontein District.

The Koffyfontein district has recently come in for a large share of attention at the hands of those qualified to know diamond possibilities. The holding secured by De Beers Consolidated Mines in the Koffyfontein Mine, the purchase of the Klipfontein Mine by the Jagersfontein Company, the taking over of the Ebenezer Mine by the Frank Smith Mines (Barnato Group), the exploiting of the Tyfelhoek Mine by the Koffyfontein East Diamond Mining and Estates Syndicate, Limited, etc., are all signs of interest and progress. Prospecting activity is also visible in other corners of the district adjacent to the route of the new railway line, notably at Tafelbergsdam, where three diamond pipes have already been located—all justified by the brighter outlook and the well-known high quality of the diamonds peculiar to the magma of this district. In the near future a visit to the locality will be possible between Saturday and Monday, whereas it is at present an expensive whole week's work.

The following advertisement appears in the "Star":—

IN CONSEQUENCE OF AN EMERGENCY.

Unique opportunity occurs for investment of £1,500 to complete flotation of fully equipped Gold Mine, absolutely proved by exhaustive crushings and existing rich developments. Above sum purchases sufficient interest to return investor an absolute independence, whilst share of assets equipment, etc., insure against serious loss. Salaried occupation if desired. This proposition is genuine and while full investigation is courted, only Principals with bank references and capable of quick decision need apply.

Oceana Consolidated.

A further *pro rata* issue of 300,000 shares of 10s. each at par is announced to shareholders registered on May 17th. The issue will be in the proportion of one new share for every seven. No fractions will be issued.

New Star Diamond Mine.

The following statement has been issued by the directors of the New Star Diamond Mines:—"This company was formed in August last for the purpose of exploring, prospecting and ascertaining the payable character or otherwise of the Monastery diamond mine in the Winburg district of the Orange Free State. The work of clearing the mine of fallen reef and reorganising the surface works occupied a good deal of time. After commencing washing it was found that an entire rearrangement of the machinery was necessary. The machinery is still defective and insufficient to enable enocomical treatment, and the sorting-house arrangements are upon so small a scale as not to permit the treatment of any considerable quantity of the very heavy deposit found in this mine. But, under all these disadvantages, the value of the property has been amply demonstrated. Since the shifting of the machinery 1,759 loads have been washed, and although sorting has been carried on under difficulties and has probably been incomplete, 421 carats of diamonds have been recovered, giving an average of 24 carats to the hundred loads. The mine is held as 100 claims, but on the north-westerly side the wall of the mine has not been reached. The ground at this point is of very good character, and it seems probable that a considerable area remains unexplored in this direction. As the object of the syndicate has now been attained, the directors propose increasing the capital of the syndicate and providing the necessary funds for the working of the property upon a commercial scale."

Situations Wanted.

METALLURGIST with more than 20 years actual practical experience in the treatment of gold, silver, copper and lead ores will be open for engagement after June 10th. Speciality: Treatment of refractory gold ores Best of local references

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CERTIFICATED MINE MANAGER holding Surveyor's certificate, has had experience as Surveyor, Miner, Shift Boss, Mine Captain and Underground Manager, seeks situation.

Apply MINE MANAGER,
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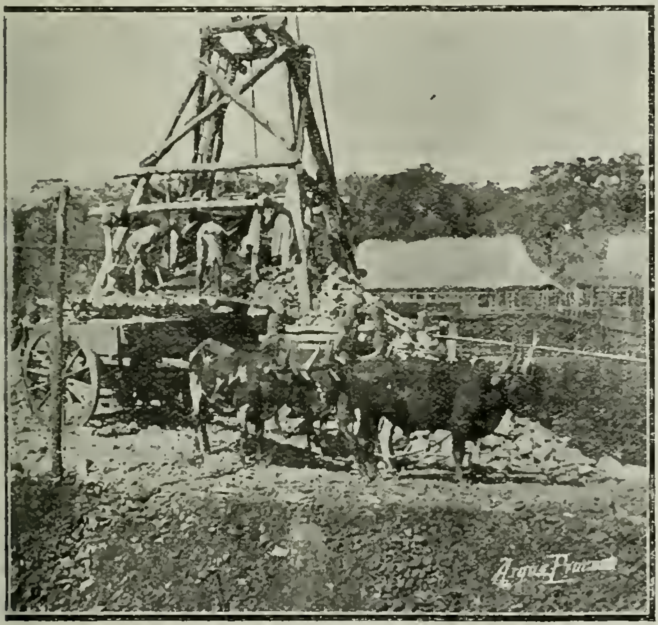
Rhodesian Section.

LATEST NEWS FROM THE MINES.

New Clifton Mines: Mr. Evans' Report—Position at the Bucks Reef—Eldorado Finances—Milling in Sight at the Turkois—Susanna Mine Developments—Water Shortage at the Old Nic—Important Strike at the Gaika—The Lonely Report.

A GOOD deal of development work is being carried out in the New Clifton Mines (Belingwe District), under the direction of Mr. Evans. Values appear to be improving as the work proceeds, and Mr. Evans, in a recent report to the directors, says that, on the whole, he is convinced that the Mount Rosa and Sable Reefs are going to justify the original opinion he formed of them, and that they will prove to be good and permanent mines. In the Mount Rosa the south face of the end level is looking very well. About fifty feet have been driven on "payable" reef. In the second level north the reef is small and somewhat disturbed, and it is not expected that any large amount of pay ore will be opened up here until the level has been extended some distance further. In the first level north the face is in the broken area, which, it is hoped, may soon be got through and "pay" reef opened out. On the Entambi the incline shaft is down to the second level, and as driving has commenced, some idea of values in this section soon should be obtained. A slimes plant is being erected on the property to deal with accumulated and current slimes.


A RHODESIAN SMALL MINE: CARTING AWAY ORE FOR THE MILL.

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At the conclusion of the quarter ended with March last the payable ore reserves in the Bucks Reef Mine had dwindled down to 3,650 tons, or only about five months' supply for the mill at the present restricted rate of crushing. During the months of January, February, and March, 2,133 tons were crushed for a total recovery of £6,844, or 64s. 2d. per ton, whilst working expenses were at the rate of 57s. 1d. per ton. The profit for the quarter was thus only £752, whilst capital expenditure absorbed £411. The following is a summary of development:—Bucks—Driving, raising, etc., 125 ft.; Prestwood—shaft sinking, 24½ ft.; driving, raising, etc., 46 ft.; total shaft sinking, 24½ ft.; total driving, etc., 171 ft.; total, 195½ ft. Bucks footage: In the 8th level west drive, the last 24 feet exposed reef going 6·0 dwts. over 54 inches. In the winze below the 8th level, 22 feet have been sunk exposing reef of value 22·4 dwts. over 27½ inches. Prestwood footage: The only reef exposed in this section was in the winze below 4th level, which gave 17 dwts. over 15 inches for a distance of 14 feet sunk.

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The Eldorado Banket mine has been much in the public eye of late. Both Mr. H. A. Piper and Mr. H. Ewer Jones have reassured shareholders in regard to development, and it is to be noted that the profit earned during the quarter ended March 31st amounted to £30,845, whilst the accumulated tailings on hand at the end of March will yield, it is estimated, a profit of approximately £950. The estimated balance of net profit (including the estimated profit on accumulated tailings), after deduction of the two interim dividends, and subject to the customary depreciation allowances, amounted at March 31st to approximately £52,250.

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Latterly, considerable work has been done on the Turkois, and it is confidently expected that a milling plant will be operating a year hence. Over 900 feet of work has been done on the 1st level, by means of seven shafts and driving, values being around 10 dwts. over 36 inches. Work on the 2nd level has been discontinued in favour of the 3rd level, which has been opened up practically to the extent of the 1st level. For over 300 feet the reef is 45 inches wide, and the values average 45s. per ton. The 3rd level is at 205 feet, but No. 2 shaft has been carried down 350 feet, and at this point cross-cutting is being done on the footwall side. The reef is expected to be reached at this point in the course of another week.

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Recent developments on the Susanna mine are of a highly satisfactory nature. The winze on the south ore body is down 62 feet below the 8th level, the reef averaging 25 dwts. over a width of 36 inches for the distance sunk. At 40 feet below this point the ore body has been struck on the 9th level, and has an average assay value of 26 dwts. over 38 inches for the 14 feet driven. A narrow reef has been struck in the continuing cross-cutting, a sample from which assayed 103 dwts. over 12 inches. A winze on the north ore body is down 86 feet below the No. 9 level, and averages 21 dwts. over 42 inches for the distance sunk. On the Lady Lina claims, a shaft is down 180 feet, the reef averaging 60 inches in width, and having an average assay value of 11·7 dwts. per ton for the last 30 feet sunk. It is estimated by the consulting engineer that there are now 6,000 tons of ore available of a recovery value of 80s. per ton, in the Susanna mine.

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Owing to water shortage, reduction work at the Old Nic has had to be substantially curtailed. A little more than a month ago the new plant, consisting of five stamps, two pans, and slimes treatment, was connected up with the ten stamps and two pans then working. Since then, however, the water service has failed to the extent of 20,000 gallons, or 50 per cent. per day, necessitating some reorganisation. The mine is now being run on the old basis of ten stamps, but within the past few days water has been encountered by sinking on the Chokeford claims, and should this supply prove permanent it will be possible to restart the additional five stamps. The slimes in the meantime are being accumulated. Development work at the Old Nic is now proceeding at and below the 7th level. Two winzes are being sunk to the 8th level, the sinking being on reef.

Confirmation of the rumours of a recent strike on the Gaika, which led to local activity in dealings with the shares of the company, has now been received. This is contained in the following cablegram, which has been despatched within the past few days from the local office to the Board of the Gaika G.M. Co. in London:—Reef has been struck in No. 9 level, cross-cut from the main shaft, assaying 16 dwts. per ton over 48 inches.

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In his report on the Lonely Reef Mine for the year ending December 31st, 1911, Mr. C. B. Kingston, the Consulting Engineer, states that the ore reserves now represent a three years' supply of ore for the new plant at the rate of 4,000 tons per month. At 31st December, 1911, these reserves, calculated over the width of reef plus 12 inches of waste, were 140,344 tons of an average value of 22·65 dwts. of fine gold per ton. The estimated profit on this ore is £450,856. The retreatment of the residues still remaining from the old mill is estimated to yield a further profit of £5,844. The total profit in sight at the end of the year was, therefore, £456,700. The ore reserves include only the ore blocked out, but the prospects in the bottom of the mine are so extremely promising that there is no doubt that the ore reserves can be well maintained and, if necessary, increased during the current year. Two new levels (the 6th and 7th) were opened up during the year 1911, and the shaft has been sunk to the eighth level, where cross-cutting to the reef is now in progress. It is proposed to sink to the 9th and 10th levels during the year 1912. A winze has been sunk to 80 feet below the 7th level to test the value of the reef. The full width of the reef is not exposed in this winze, but the portion that is exposed averages 45·83 dwts. over 44·45 inches. The full width of the reef has been tested at the bottom of the winze, and has been found to assay 42·29 dwts. over 66 inches. This result is exceedingly satisfactory. It is noteworthy that the reef is still completely oxidised at a depth of nearly 900 feet. This is very unusual.

THE RHODESIAN APRIL OUTPUT.

Some Facts and Figures Concerning Production—Districts and Mines Contrasted.

Both Matabeleland and Mashonaland recorded improvements in the April output as contrasted with the March return. The output of the former Province at £121,296 was £3,500 higher, whilst the production for Mashonaland was £100,180 as against £97,315. Taking into account the lesser mining time, the last announcement must be judged satisfactory and may well be the precursor of still larger returns during the winter months. The water shortage, it is true, is a disturbing factor, but apparently the seriousness of the position has been much exaggerated, and although mills in some districts are likely to feel the pinch rather severely, it is unlikely that any very marked contraction of output will result. It is to be noted that the Old Nic mine, near Bulawayo, which is one of the properties at which scarcity of water has occasioned some trouble, had fifteen stamps and four pans at work—three stamps and one pan more than in March, whilst the output advanced by about £1,700. Another mine in the Bulawayo district which registered a large advance is the Claremont, the return for April being £5,092, the March output being less than £3,000. The ordinary mill recovery of the Globe and Phoenix is " down " about £5,000 for the month, but this is counteracted by a return of £5,776 " not previously declared "—whatever that may mean. The new plant for the treatment of auriferous stibnite ores should assist in improving returns at this proposition. A few new producers figure in the Matabeleland output—the Invulnerable, N'Kanya and Nelly F, for example—but these are all small concerns, the flotsam and jetsam of the industry, so to speak, and their returns are not very important. Reference may be made to the comparatively very high recovery from secondary treatment recorded by the Lonely. It has been found that the ore at this mine requires finer grinding than was originally anticipated, the two tube mills at present installed being unable to crush 4,000 tons per month to the required fineness. A third tube mill is accordingly being installed. In April, 2,628 tons were crushed and 3,910 tons of slime treated, the mill yield being 371 ozs. and that from slime 2,763 ozs. In Mashonaland the Giant yield, all from the mill, was £18,079 and £17,823 in April, whilst the other large producer, the Eldorado, recovered £12,621 from mill and £5,252 from tailings, as compared with £15,548 from mill and £3,151 from tailings in the preceding month. The Hay ran one tube mill and put through 2,215 tons for a yield of £2,984. In the preceding month the tube mill was operated in conjunction with 10 stamps, and 1,900 tons were milled for an output of £557 from the mill and £2,299 from cyanide works. In the Umtali district the outputs of the Penhalonga and Rezende mines show but little alteration. A few names not contained in the March schedule figure in the list of producers for April, amongst others the Cairn Dhu and Palmyra. Taking the output according to districts, the returns for April and May compare as under:—

	April.	*March.*
Bulawayo	£55,158	£49,079
Gwelo	66,138	68,708
Hartley	53,204	50,611
Salisbury	2,191	1,771
Mazoe	10,163	9,454
Lomagundi	18,456	20,157
Umtali	16,166	15,195

Mashonaland should before very long begin to outdistance the sister Province, the districts of Mazoe and Hartley each containing important mines in a fairly advanced state of development, which should assist in swelling the output in the near future.

Lomah Stoessel Banket.

Tivoli claims (Hartley district) is a property held under working option, situated about four miles south-east of the Hartley railway station, and comprises 80 claims. Prospecting operations conducted have disclosed by surface trenches a serpentine dyke, known as a " stockwork " of quartz veins running in all directions and carrying gold. The ore-body ranges in width from 80 ft. to 140 ft., and values up to 31 dwt. have been found in these surface workings. Tivoli claims contain the strike of the formation for a length of about 6,000 ft., and numerous ancient workings exist along the strike. Mr. H. I. Johnston, consulting engineer, has reported that at a depth of 42 ft. in No. 5 shaft a drive east was extended for 50 ft., disclosing at that point ore 39 in. wide, assaying 9 dwt. gold per ton. A cross-cut to the north was put in and it was found there existed a further 66 in. of ore, assaying 54 dwt., making a total width of 105 in., assaying 37 dwt. gold per ton. The drive goes beyond this point, and at 60 ft. in, 60 in. of ore assayed 10.6 dwt. Since these important discoveries were made the No. 5 shaft has been carried down to a depth of 54 ft. Assay values in sinking from surface to 35 ft. averaged 11.6 dwt. per ton. At the bottom of the shaft (54 ft.) ore is now assaying 40 dwt. over full width of the shaft. Instructions have been cabled to Rhodesia to press on with the development of this large ore-body at depth.

Deep Boreholes.

The three deepest boreholes in the world, says a German exchange, are in Prussia, all three reaching a depth of more than 2,000 metres. One, with 2,003·3-metre depth, is near Paruschovitz, in the Rybnik district; the second, with 2,149·4 metres, is at Schubin, in the province of Posen; and the third, with 2,239·7 metres, near Czuchow, in the Rybnik district.

THE GREAT COPPER FIELDS OF KATANGA.

A Region of Wealth and Problems—Position in the Tanganyika Concessions.

Few base metal properties have evoked so much interest as the great copper areas of the Southern Congo, generally spoken of as "Tanganyika Concessions," or in stock-market phraseology "Tanks." For the present the Katanga mineral belt is under somewhat of a cloud. The ambitious treatment programme has, as was generally anticipated, proved a failure. The smelters have run intermittently, and at the moment are idle. It is clear that the metallurgical programme will have to be remodelled. Further huge sums of money will be necessary for the achievement of this work. Apart from these domestic troubles, the linking-up of Katanga with Lobito Bay is a crying economical necessity. A railway is advancing from the coast to the interior, but its progress is slow, and in any case its completion will be a very expensive matter.

Katanga and the Rand.

Why have not the large South African mining and financial houses taken a hand in the game of developing the Katanga mineral belt? It is indisputable that the quantities of copper existent there are very great indeed, and surprise is often expressed that the big Johannesburg-London groups have not interested themselves in the Katanga region. As a matter of fact influential Rand firms have despatched mining engineers to the copper fields of the North, and have instituted first-hand enquiries into the value and general prospects of the enterprise. It is rather significant that so far these groups have refrained from interesting themselves in the Katanga, and it is an open secret that this "stand-off" attitude has been the consequence of doubts and fears as to the economic treatment of the ores. The report of the Tanganyika Concessions, just issued, shows that the latest smelting in the Katanga with European coke cost £41 10s. per ton at the works; with Wankie coke, £26; and with partly Wankie coke, £30. With improved arrangements for washing, the report states, copper can be landed in the European market at a little over £30 per ton. It is to be hoped that this latter anticipation will be materialised; from the figures given above it is evident that the smelting operations to date have been far from satisfactory. However, it by no means follows that because the Rand groups have hitherto eschewed Tanganyika they will continue to do so in the future. Who knows but history may repeat itself, and as the fortunes gained in Kimberley developed the Rand, so may the financial powers of Johannesburg promote the industrial growth of Katanga?

A Vast Cupriferous Belt.

A few years ago these copper mines existed in the minds of most people, as "somewhere in the heart of Africa," but that they would become mineral producers of consequence in a short space of time, did not enter into the calculations of anybody, besides Robert Williams and his colleagues—the men who have been mainly responsible for the exploitation of these copper belts, and for the linking of them up with the ports of South Africa. When it is stated that authorities have declared that these mines are capable of yielding almost unlimited tonnages of ore containing close on to 30 per cent. copper, that others have stated that these properties have 300,000,000 tons of ore in sight, and that as a fact four years ago there were 6,000,000 tons developed in the properties above tunnel levels, while since then these tonnages have been greatly increased, it will become evident that these mineral deposits are worthy of the very closest attention of mining men, financiers and the investing public, all the world over. It is perhaps hardly necessary to point out that some of the statements circulated regarding these mines are in all probability gross exaggerations. On the other hand, absolutely reliable mining engineers have testified to the magnitude of the deposits and the great productive potentialities of the mines. About the year 1898 prospecting expeditions discovered large base-metal deposits in Northern Rhodesia. Further exploration led to the location of cupriferous zones on the borders of Northern Rhodesia and the Congo Free State, and also in the Congo early in 1899, and the Zambesia Exploring Company, Ltd., floated the Tanganyika Concessions, Ltd., the company which has been mainly responsible for the development of the Katanga copper region. The nominal capital of this company is at the present time £1,000,000 in £1 shares. Of these, 758,094 are issued and are quoted on the market at £6 15s. The debentures amount to £2,187,864 five per cent. in £8 bonds. The Katanga minerals have been transferred to the great Belgian company, the Union Miniere du Haut-Katanga, in which the holding of the Tanganyika Concessions is now 45 per cent. The company also holds a two-fifths interest in the Katanga Railway Company, and 2,700,000 shares in the Benguella Railway Company. Other interests of the company are: £178,000 debentures, 500,750 ordinary £1 shares, 44,500 B. 1s. shares (Rhodesia-Katanga Junction Railway* and Mineral Company), and 51,353 £1 fully-paid shares, 19,996 1s. paid shares (North Zambesia Concessions, Ltd.) and £5,000 debentures, Rhodesia Railways, Ltd., mineral concessions over extensive areas in the Congo Free State, as well as the Luano coal areas in North-Western Rhodesia, trading and township rights, etc.

The Katanga Mineral Belt and Its Situation.

The situation of the mineral belt is between latitudes 10° and 12° S. The easterly and westerly limits of the belt may be defined as the Star of the Congo mine, and the Dikurwe mine, a total distance of about 200 miles. The altitude of the district is between 4,000 and 5,000 feet above the sea level, and the country is well wooded and well watered. There are in all more than 100 mining locations on this copper belt, and of these only about a score have been opened up to any appreciable extent. The geological formation of the country is in the main sandstone and dolomitic limestone. In the hills the beds have been much weathered; much of the dolomite has had its soluble constituents leached out of it, and there remains a cellular quartzite rock, overlying and underlying which are the sandstone beds carrying carbonates and silicates of copper. The average thickness of the cupriferous sandstones throughout the Katanga belt is probably in the neighbourhood of 90 feet. In all probability the ore originally existed in the form of sulphides; was converted into copper carbonate by surface waters, and was then re-deposited in the sandstones adjoining the cellular quartzite. Under the direction of the technical advisers to the Tanganyika Concessions and the Union Miniere, numbers of tunnels have been driven into the hillsides, and shallow shafts have been sunk, and crosscuts have been driven from their bottoms. It is impossible to say how much ore has been made actually available for mining by these operations, but it is a certainty that many millions of tons are awaiting removal and treatment, and that a great deal of this ore will yield about nine or ten per cent. metal. In some of the tunnels the width of ore exposed is often enormous. This width is, however, in many instances, more apparent than real, as on account of contortion of the strata most of the tunnels have been driven diagonally across the beds.

Expert Estimates.

Towards the end of 1907 Mr. Frecheville, the eminent English mining engineer, was commissioned to report on the properties of the Tanganyika Concessions, Ltd. His report has never been published; but Mr. Robert Williams recently took shareholders into his confidence to the extent of giving calculations as to ore in sight. Three experts have reported upon the different deposits. Estimates of ore proved are as follows:—

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* To this company, properties and rights, including the Kansanshi mine, were transferred in 1909.

	Tons of Ore.	Copper. %	Copper. Total Tons.
Kambove—			
Mr. Frecheville	1,800,000	12	215,000
Mr. Atherton	2,500,000	11	350,000
Mr. Gibb	3,000,000	12	360,000
Star of the Congo—			
Mr. Frecheville	435,000	14 & 9	50,000
Mr. Atherton	1,500,000	11	165,000
Mr. Gibb	1,200,000	15 & 6	106,000
Mr. Atherton's Other Estimates—			
Fungurume	1,500,000	7	112,000
Kwatabala	1,150,000	7	85,500
Likasye	1,000,000	12	120,000
Kabalela	1,000,000	7	75,000
Dikurwe	800,000	12	96,000
Musonoi	600,000	9½	57,000
Kolwezi	450,000	13	60,000
Kakanda	350,000	9	30,000

These figures refer only to ore found to exist by the shafts and underground work that has been done. Mr. Frecheville, it will be seen, has made the most conservative report. The discrepancies existing between the different estimates are remarkable.

THE QUESTION OF METALLURGY.

Granted that the quantities of ore existent in the Katanga copper region are so enormous that they cannot at the present moment be estimated with any degree of accuracy, the metallurgical and commercial aspects of the undertaking have next to be considered. On the average the Katanga cupriferous ores carry about 60 per cent. silica, or about 40 per cent. over and above the amount that would be fluxed off by the bases present. It has been an open secret for a long time past that the metallurgy of these deposits presents a difficult problem. The distance from the seaboard, the highly siliceous nature of the ores, the large quantity of flux required and the distance which flux has to be brought, together with the heavy cost of coke, are all factors which combine to make the treatment problem one of unusual complexity and difficulty. The advisability of adopting some wet method of treatment becomes obvious when one takes all the factors set forth in the above into account, but whether there is any leaching method in existence, the success of which has been demonstrated, when working on a large scale, and which is suitable for the conditions obtaining in the Katanga region, is debatable. There seems to be a certain amount of secrecy maintained as to the exact nature of the process adopted at the Star of the Congo, Kambove and the other mines. Very possibly Tanganyika Concessions will be the first mining company to prove the success of a wet process in dealing with an ore containing 60 per cent. silica, and situated under similar conditions to those obtaining at Tanganyika, but that success has yet to be practically demonstrated. It was recently announced that the Rhodesia-Katanga Junction Railway and Mineral Company had discovered an extension of the Kalulu Coalfields. It is reported that an additional area of five miles of coal measures has recently been located. This, it need scarcely be said, is of vital importance to the Tanganyika Concessions, although more value would be attached to the statement if it were recorded what the coking qualities of the coal were. For months past prospecting and initial development work has been proceeding, under Tanganyika Concessions Rhodesia-Katanga Junction Railway auspices, in the Luano Valley and Kalulu areas, and it appears that large quantities of coal have been located. But of the coking properties of these coals nothing is at present known, and from the fact that the Tanganyika Company have been for a long while past negotiating with the Wankie Colliery for the supply of coke, it must be inferred that the Luano and Kalulu measures are deficient in those elements of which the Katanga copper fields are greatly in need. The Katanga is on account of its geographical position a region of extreme economic problems and difficulties. No one will detract from its great value or contest the probability that most of the difficulties will in time be solved. But in the opinion of those competent to judge, the day of solution is still a good long way off.

Kolmanskop Diamonds.

In our issue of the 18th inst., the output of diamonds from the Kolmanskop Company's property for the month of April is stated at 10·148 carats. This should have read 10,148 carats.

American Diamond Imports.

Mail week's imports of precious stones to the United States of America, consisting chiefly of diamonds, were, according to the Government's return, valued at $1,173,000, which compares with $189,000 for the previous week, with $681,000 for the corresponding period of last year, and with $629,000 two years ago.

Fire at the Crown Mines.

A call was received by the Fire Brigade at 2.16 a.m. on Sunday from the Crown Mines (Crown Reef section), where a fire had broken out in the change-house, which is situated next to the mine offices of the headgear. The horse-machine and crew turned out from the Western Station, and Acting Chief Officer Rowe, with the petrol motor pump and crew, from the Central Station. On arrival at the mine it was found that the change-house was well alight, while the headgear and offices were in danger. The building was completely gutted.

Last Tuesday evening the men of the mill and platehouse at the City Deep mine recognised by a presentation the services of Mr. K. B. Lamont, who has just relinquished the position of mill-manager to take up an appointment with the Barnato group.

New Vaal River Diamonds.

The following particulars of the diamond output of the above company for May have been forwarded by Mr. C. Marshall (secretary):—During the month 138 diggers on the company's estate registered 2.025¾ carats of diamonds, which realised £11,594 5s. Included in this output was a magnificent stone of 141¼ carats, sold for £1,555, 1.9¾ carats at £12 10s. per carat, 1.15¼ carats at £11 7s. per carat, 1.63¼ carats at £11 1s. 6d. per carat, 1.26 at £11 1s. per carat, 1.17½ carats at £11 per carat, 1.18¼ carats at £10 5s. per carat, 1.22¾ carats at £10 2s. per carat, 1.68 at £10. 1.13 at £10, 1.26¼, 1.25¼. 1.23¾, 1.23¼, 1.17¾, 1.15¼, 1.14½, 1.14¼, 1.13½, 1.12¾, 1.12, 1.10¾ 1.10½ and 1.10 carat stones.

The governing body of the Imperial College of Science and Technology have appointed Mr. William Frecheville, A.R.S.M., M.I.M.M., to be Professor of Mining in the Royal School of Mines, in place of Prof. S. Herbert Cox, who is about to retire.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Illogical Precision in Mine Reports.

To the Editor, *South African Mining Journal.*

Sir,—There was some reason for Mr. T. A. Rickard's protest with regard to the careless and inaccurate use of language in technical reports, but it was, nevertheless, hyper-critical. The English language is not dead, and if it is to continue the process of vigorous growth which has characterised it for centuries it must not be prohibited from assimilating new words or from modifying the meaning of words in common use to suit its various requirements. It has done so from its earliest years without detriment to its strength and flexibility, indeed rather to its advantage. The modifying of the meaning of the word " payable " to meet the necessities of the mining engineer is a case in point, to quote an example which Mr. Rickard declaims against, and one which is in common use in this, as well as in other mining communities. If Mr. Rickaard's paper was hyper-critical, what term can be fittingly applied to that of Mr. F. Percy Rolfe, to which reference was made in the last issue of the *S.A. Mining Journal?* The only word I can think of, at the moment, to describe it is " finical."

It would, of course, be absurd for any engineer to state that a mine had a reserve of, say, 2,788,099 tons, as if he really believed it had just so many and no more. Why, then, are these figures given in the case mentioned by Mr. Rolfe? Merely, as everybody knows, who knows anything at all about the matter, that they are the actual result of the factors used in the calculation. Mr. Rolfe thinks that, as a matter of fact, 2,788,000 would have expressed the ore reserve just as accurately. It may quite as truly be said that the latter figures would have expressed it just as inaccurately, on the grounds that the first are likely to be considerably wide of the mark on one side or another. If calculations correctly made give a particular result, why should the nearest round sum be used to supplant the actual figures? The sum of 2,788,100 is just as definite to the unthinking person as the other, and the difference between them is that one represents a true working result and the other does not: one is vague, in a word, and the other is intelligible. The same may be said of assay calculations. One must have definite data to commence with, and, since definite data give definite results, there is no sound reason why these results should not be stated exactly as they occur. If precision is necessary in the earlier stages of a calculation, why not let it prevail to the end? Everything depends upon the condition of mind of the person or persons for whom these various figures are intended. If it is a normal one, Mr. Rolfe's suggestions are not really needed: if not, the addition of a simple but comprehensive statement of the meaning of the actual results would be much better than a rounding off into globular sums or undivided units.—I am, etc.,

ENGINEER.

Qualifications of Mine Inspectors.

To the Editor, *South African Mining Journal.*

Sir,—The abortive prosecutions recently instituted against the managers of the Crown Mines by the Mines Department for alleged breaches of the Mines Regulations together with a careful study of the magisterial verdict in the last case, would at all events seem to indicate that only persons of suitable training and experience should be appointed to the position of mine inspector, if due regard is to be paid in the future to the proper carrying out of the provisions of the Mines, Works and Machinery Regulations. Until about a year ago it was generally regarded as the sole duty of the different inspectors of mines to see that these regulations were properly observed, and to what extent they succeeded in complying with those duties has all along been evident in the flagrant manner in which the Mines Act has been broken, and last but not least by the well-nigh universal existence of miners' phthisis. A year ago, however, a change of policy was made by the Mines Department, whereby the responsibility of carrying out the Mining Regulations was sought to be placed upon the shoulders of the managers, the mine inspector becoming thereby a kind of superior officer to the mine manager and supervisor of the manner in which the mine manager was compelling the carrying out of the Mining Regulations. Now, before a mine manager can be awarded a certificate of competency or manage a mine on the Rand, he must prove that he has previously acted as a mine manager for three years or had five years' experience in practical mining and pass an examination before a board of examiners appointed for that purpose. If it is necessary for a would-be mine manager to have a certain amount of practical experience and submit himself to examination before being allowed to manage a mine, how much more necessary is it that any one who aspires to the higher position now occupied by a mine inspector should have had an even longer experience and training and pass a more advanced examination before being allowed to assume the duties and position of an inspector? Nowhere, however, will it be found in the Mines and Works Act that any specified qualifications for the appointment of mine inspector exist, and this may perhaps explain why some of the appointments made can scarcely be deemed satisfactory. At all events such an omission leaves open the possibility of favouritism rather than experience and training being the governing feature in the appointment of a mines inspector, and in such an important matter favouritism ought not, of course, to exist. When all is said and done, the least qualification that ought to be expected, one would imagine, would be that not only should the candidate be the holder of a mine manager's certificate of competency but should also have occupied for some time at least the responsible position of a mine manager. In the absence of this stipulation as to qualification, how can an inspector be required to supervise the doings of a mine manager or even his subordinates, as is now required by the new policy adopted towards the mine manager by the Mines Department? At the hearing of the recent Crown Mines case one of the inspectors stated that he had two years' experience of diamond mining—in what capacity did not transpire—and two years' experience on the Rand in subordinate positions, but it was not claimed that he had ever filled any position approaching that of a mine manager. Now such qualifications alone will not as regards experience qualify a candidate to be examined for a mine manager's certificate, which stipulates for five years' practical mining experience. However, a short cut to obtaining a mine manager's certificate is allowed to a candidate possessing a diploma of the South African School of Mines, which for practical mining can be of little value to a mine inspector as compared with practical experience gained as a mine manager. Still this inspector had been granted a mine manager's certificate, which apparently had never been used, and this fact may perhaps explain the peculiar views expressed that a ganger over tramming boys should always remain with his gang, a condition quite unnecessary where tracks are properly laid and impossible if the ganger is to do his duty. Surely the necessary experience and qualifications for a successful mine inspector ought to be different to those detailed above, if he is expected, as it were, to supervise the doings of a fully qualified and experienced mine manager. Besides, he should be able to give expression to such views as will at least harmonise with those of his fellow-inspectors without compelling the magistrate, through the expression of these diverse views, to be compelled to give his verdict against the Mines Department. Such a result tends to not only cast discredit upon the Mines Department, but likewise on the Mining Regulations it is called upon to administer. When dealing with this part of the question attention might very properly be called to the fact that in last year's list of certificates awarded, according to the *Government Gazette*, appears the name of another mine inspector who prior to receiving that certificate acted for several years as a fully-fledged inspector of mines. Now it would be interesting to know how the Government Mines Department can expect mine managers, themselves holding certificates and other superior qualifications to respect and obey the instructions of an inspector, who at the time does not even command the necessary qualifications to manage a mine, a mine inspector only quite recently read a paper pointing out the economic advantages of using water in connection with the underground drilling of holes, advantages every practical miner recognises and is taught before he has been many months in a mine. Then again the Mining Regulations require and stipulate that on the Rand water shall be used, and if an inspector was successful in maintaining a strict observance of the Mining Regulations, the reading of such a paper would, to say the least, be superfluous. In replying to the discussion on this paper the inspector very properly pointed out the many advantages of good mining discipline, but he adopted the same erroneous attitude, as other inspectors have done, in insisting that it was altogether the duty of the manager to insist on the observance of the Mining Regulations and strict mining discipline. An illustration was quoted to the effect that as a rule the untidy condition of an underground station was a key or indication to a loosely disciplined mine. That to some extent is so, but then does not a dirty station and the riding of thirteen or more persons on a skip only licensed perhaps to carry eight, not only indicate an ill-disciplined mine, but also its situation as being in a district where the inspector cannot or does not possess the necessary qualifications and abilities needed to carry out his duties? It is clear, therefore, that if the accident death-rate on the Rand is to be lowered, not to mention the deaths from miners' phthisis, due regard will have to be paid to the full observance of the Mining Regulations. If the Mining Regulations are to be carried out by placing the onus on the shoulders of the mine managers through the medium of the mine inspectors, capable, experienced and qualified inspectors of mines will have to be appointed. A mine manager cannot be expected to carry out foolish and impossible instructions, such as an inexperienced inspector might be capable of giving, and the sooner some definite qualification, if possible superior to that of a mere mine manager, is established, the better it will be for all concerned. In many mining countries candidates for the appointment as inspector of mines must not only be nominated by the Minister of Mines, but they must likewise pass a suitable mining and civil service examination, and above all have had a stipulated experience as manager of mines or otherwise before they can count on being nominated for the examination. Here no semblance to a recognised qualification seems to exist, and where kissing goes so much by favour is there any wonder that unsuitable appointments to such a responsible position should be sometimes made?—Yours, etc.,

G. R.

New Kleinfontein.

May results were:—220 stamps ran 30 days; 43,000 tons milled; 14,842 fine ounces output; £62,210 value, less cost of realisation; £42,693 working costs; 19s. 10d. working costs per ton; £19,517 profit; £10,623 capital expenditure.

Moore Filters and Lactic Acid.

"Metallurgical and Chemical Engineering" for April gives particulars of the application of lactic acid for the purpose of removing lime compounds from filter leaves. The Moore Filter Co. is now using this acid instead of hydrochloric acid. It is stated that it is equally efficient for the purpose intended, and that it has several advantages. For instance, it does not harden and destroy the filter fabric; also, as it is not volatile or corrosive it can be handled without risk, and can be shipped by rail at ordinary rates. The acid may be regenerated from the calcium lactate by blowing sulphurous acid through the solution.

Manufactured Rubies.

When the fact becomes generally known that manufactured rubies can be produced which are as real and attractive as natural rubies, there should be a very substantial slump in the high prices now charged for the rubies of natural origin. Professor Silvanus Thompson gives an interesting account in a letter to the "Times" of the way in which the manufactured rubies are produced. These are not the artificial imitations made of red glass or paste. Reconstructed rubies are real rubies made by taking small real rubies or particles of ruby dust and melting them together so that they crystallise into one larger gem. Synthetic rubies are manufactured by fusing and crystallising together the still more minute particles of oxide of aluminium, the material of which the ruby itself consists. The reconstructed ruby is stated to be equally hard, equally capable of taking a polish, and identical in crystalline form with the natural ruby. The expert can distinguish it only by slight differences in the interior flaws and microscopic bubbles; the manufactured ruby having usually fewer flaws than the natural ruby, and the microscopic bubbles in it have a different shape from those of the natural ruby. The fact that the dealers still charge much higher prices for the natural gem than for a manufactured one of equal weight, colour, and clearness does not touch the question of the genuineness of the manufactured article.

City and Suburban.

The May returns from the City and Suburban mine are as follows: Ore crushed, 28,050 tons; gold recovered, 12,642·116 fine ozs.; profit, £22,381.

Transvaal G.M. Estates.

The following is the output of the mines of the Transvaal Gold Mining Estates for May:—Central Mines: Tons crushed 11,950, yielding 8,394 ozs. fine gold, valued at £35,016. Elandsdrift Mine: Tons crushed 665, yielding 58 ozs. fine gold, valued at £2,741. Vaalhoek Mine: Tons crushed 1,526, yielding 428 ozs. fine gold, valued at £1,781. Total value of month's output, £39,538; estimated profit for the month, £23,258.

The Village Main Reef Gold Mining Co., Ltd.

(Incorporated in England).

NOTICE TO SHAREHOLDERS.

NOTICE is hereby given that the Ordinary General Meeting of this Company will be held in London, on WEDNESDAY, 12th JUNE, 1912, when the Directors will recommend the declaration of a Dividend of 7/- (Seven Shillings) per share, free of Income Tax, payable to all Shareholders registered in the books of the Company on the 29th day of June, 1912.

By Order of the Board,

RAND MINES, LIMITED,
Local Secretaries.
S. C. STEIL,
Joint Secretary.

Johannesburg,
5th June, 1912.

STRIKING PROGRESS AT THE SHEBA.

Points from Reports of the Manager and Consulting Engineer.

The General Manager of the Sheba, Mr. H. B. White, reports as follows, for the six months ended 31st December, 1911:—Mining: During the period under review ore has been extracted as follows: Zwartzkopje, 23,978 tons, value 13·39 dwts. per ton; Insimbi, 1,293 tons, value 6 dwts. per ton; Southern Cross, 1,645 tons, value 7·1 dwts. per ton; Birthday, 5,689 tons, value 10·76 dwts. per ton; Old Sheba Mine, 680 tons, value 4 dwts. per ton; total, 33,285 tons. Development: The following footage has been done:—July, 656 feet; August, 959 feet; September. 857·5 feet; October, 723 feet; November, 733·5 feet; December, 488·5 feet; total, 4,417·5 feet. Distributed as under:—Zwartzkopje, 2,641·5 feet; Insimbi, 340 feet; Southern Cross, 155 feet; Birthday, 1,132 feet; Z.K.E.B., 149 feet, total, 4,417·5 feet. The result of the above development is as follows:—Zwartzkopje: This has continued the chief producer and 72 per cent. of the total tonnage crushed has come from here during the period. In spite of this the ore reserves here have been maintained and added to. On Nos. 2, 5 and 7 levels development has been satisfactory, but Nos. 1, 3 and 4 have not as yet been successful owing to their not having advanced sufficiently to meet what I consider is the main ore chute. Having only a limited amount of power available for development work, preference has been given to those levels which would give the earliest results. Insimbi: It has only been possible to conduct development operations here on a small scale; the result, however, has been satisfactory and has added to the ore reserves. There is ample scope here for further successful development if sufficient labour were available for the purpose. Intombi: This awaits further development, good values being in sight in the bottom of the mine. Southern Cross: Nothing has been added to the ore reserves here during the period on account of my being unable to open up the bottom level through insufficient labour. Birthday: All the pay rock in sight has been extracted, but further exploratory work will be undertaken when possible. Ore Reserves: I estimate the ore reserves at the 31st December, 1911, as follows:—Zwartzkopje, 102,000 tons; Insimbi, 17,000 tons; Intombi, 2,000 tons; Southern Cross, 6,000 tons; total, 127,000 tons. The ore reserves at 30th June, 1911. were estimated at 104,250 tons. Gold extraction: The following is the result for the six months ended 31st December, 1911:—Total tons treated, 33,285 tons; average assay value of ore per ton, 12·47 dwts. Gold extracted, inclusive of addition to reserve account, 16,880·050 fine ozs. Extraction: By amalgamation, 32·34 per cent.; by cyaniding, 48·99 per cent.; total, 81·33 per cent. Gold held in reserve as at the 31st December, 1911, 1,816·039 fine ozs. Surface: Repairs have been effected at the generating station and fifty stamps have been equipped for being electrically driven. During November some of these commenced service, but owing to the dryness of the season lowering the water supply at the generating station, I have since been precluded from working more than thirty of these stamps. Machinery and plant generally have been maintained in a good state of repair. Native labour: This has fallen short of my requirements throughout the half year, but it is reasonable to expect that the supply will be augmented at an early date.

The Consulting Engineer, Mr. G. C. Fox visited both the Sheba and Rosetta properties during February, and the following is a synopsis of his report:—

Sheba.—*Zwartzkopje.*—The prospects here are, in my opinion, very satisfactory; a large body of highly payable ore has been already developed on the second, fifth, and seventh levels on the fracture underlying the chert bar in the Western part of the Mine, and there is every reason to believe that the same ore chute will be encountered on the other levels when sufficient development has been done. The supply of native labour has not been sufficient to permit of the simultaneous development of all the levels, and to maintain the supply of ore to the mill. Owing to the shortage of labour it has been found necessary to stop some of the development drives, and place the machine drills in the stopes for the purpose of breaking ore for the mill. While on the mine I visited, with the Manager, the various stopes and development drives and agree with him as to the ore reserves already developed. *Insimbi.*—In this Mine a certain amount of development has been done on both the Eastern and the Western sections. On the Western end of the Mine, at the fifth level, the development has disclosed a quantity of payable ore beyond the point at which the payable values were formerly supposed to cease. Development has been temporarily suspended here, but so soon as labour, or power is available work will be resumed. On the Eastern side of the Mine, at the fifth level, the ground is disturbed by the Edwin Bray dyke, but there is reason to believe that further work will prove the existence of the Zwartzkopje fracture, and in all probability the pay chute will be picked up either at this level or on one of the lower ones. *Southern Cross.*—In this mine development work is proceeding, and some 6,000 tons of highly payable ore have already been opened up. The chute is about 300 feet long and is now being developed by means of two winzes below the second level; at the time of my visit the winzes had reached a depth of about 50 feet, and were in ore of value equal to that in the level above. The ore throughout in this mine equals from 10 to 12 dwts. over about four feet. *Birthday.*—Work has been temporarily stopped here for want of labour; so soon as this is available development will be resumed. *General.*—The rainfall has this year been far below the average, consequently the river is very low On this account the amount of power available from the generating station has only been sufficient to run about 30 stamps electrically. The mill plant has been well maintained, and, with the exception of some pile blocks which have become rotten, is in good condition. The Wilfley tables which have been installed are doing excellent work, and the benefit of the change from Frue vanners is now being felt. A number of improvements have been made by Mr. White during the past six months.

Rosetta.— *Blue Reef.*—The development work done on and below the third level, during the last month or two, has disclosed no payable ore; the known ore bodies on this level are being rapidly exhausted, and there appears to be very little prospect of more payable ore being discovered in this part of the mine. *White Reef.*—Within the last few weeks a payable body of ore has been discovered on the White Reef line to the east of the point where it had previously been worked. This part of the old workings had previously been sampled, but gave no values. A small amount of work in the cutting disclosed payable values and led to a further examination, which resulted in payable values being found within a few feet of the old faces. At the present time a payable length of about 70 feet has been opened up along the strike and to a depth of about 50 feet. The reef averages about 3 feet in thickness, and about 9 dwts. in value. Driving has been commenced to ascertain the extent of the values along the strike. Until these drives have been advanced some distance, and a certain amount of sinking done, it is impossible to form any estimate of the quantity of ore which will be available from this source. In any case it appears reasonably certain that the quantity will be sufficient to keep the mill running for the next month or two, and it is possible that the pay chute may be found to lengthen with increasing depth, and to carry payable values below the point where these have ceased in other parts of the White Reef.

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THE MAY OUTPUT: GROUP RETURNS.

Rand Mines Group.

The following are the results of crushing operations of the subsidiary companies of the Rand Mines, Ltd., group May:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	65,300	18/ 4	22,936	£36,508
Geldenhuis Deep.	300	7	57,200	25/ 7	21,570	17,135
Nourse Mines ...	260	7	55,000	21/ 8	19,891	23,498
Ferreira Deep ...	160	4	34,460	21/ 3	18,981	43,017
Crown Mines ...	660	26	163,400	18/ 0	61,851	112,126
Durban Rood. D.	100	3	25,340	24/10	8,952	6,000
Totals & averages	1780	54	400,700	20/ 4	154,181	£238,284

The declared estimated monthly profits for 1912 are:—January, £206,122; February, £209,989; March, £267,731*; April, £224,289; May, £238,284.

*Including £50,129 special declaration of reserve gold.

The following are the results of crushing operations of the Eckstein companies of the Rand Mines, Ltd., for May:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	32,600	18/ 2	14,004	£29,084
New Modder... ...	180	7	47,850	19/ 8	22,270	45,896
City Deep	110	9	40,700	24/ 1	17,872	25,638
Village Deep... ...	180	6	51,700	19/ 2	16,800	20,837
Village Main ...	220	6	40,336	18/ 5	19,188	42,680
Ferreira	80	3	17,500	19/ 4	6,060	7,940
Robinson...	250	6	50,100	14/10	24,700	65,650
Bantjes	80	3	25,010	23/11	8,591	6,059
Totals & averages	1180	45	305,796	19/ 5	129,485	£243,784

Village Deep.—The grade of ore milled by the Village Deep was below the average of the payable ore reserves.

The declared estimated monthly profits for 1912 are:—January, £221,326; February, £213,242; March, £373,426;* April, £225,284; May, £243,784.

*Including £151,119 special declaration of reserve gold.

Neumann Group.

The following are particulars of the results achieved by the crushing companies in this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Wit. Deep	38,130	£53,386	£17,043
Wolhuter	30,400	41,034	15,107
Main Reef West	19,362	31,479	10,657
Consolidated Main Reef ...	23,806	32,619	8,822
Knight Central	24,850	29,538	5,154
Treasury-cum-Jumpers ...	—	—	430
Total for group			£57,213

Reserve Gold.—Wolhuter, 2,618·227 fine ozs.; Consolidated Main Reef, 114·039 fine ozs.

The Albu Group.

The May operations of the producing mines of the Albu group are as follows:—

Company.	Stamps.	Tube Mills.	Tons Crushed.	Total Cost.
Aurora West	80	—	14,072	£14,130
Cinderella Consolidated ...	80	3	19,566	23,762
Meyer and Charlton	75	2	14,309	13,316
New Goch	120	4	28,150	23,471
Roodepoort United	55	4	33,437	28,368
Van Ryn	125	6	39,640	31,424
West Rand Consolidated ...	100	4	27,400	31,611
	635	23	176,574	£166,082

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	20/ 0·9	£17,145	£3,014
Cinderella Consolidated ...	24/ 3·5	29,819	6,057
Meyer and Charlton	18/ 7·3	30,422	17,106
New Goch	16/ 8·1	30,081	6,609
Roodepoort United	16/11·6	33,409	5,041
Van Ryn	15/10·2	55,501	24,077
West Rand Consolidated ...	23/ 0·9	37,675	6,064
		£234,052	£67,968

The monthly gross profits for 1912 are:—January, £62,769; February, £48,400; March, £61,777; April, £60,494; May, £67,968.

Roodepoort United.—The lower grade is due chiefly to the low value of the development rock milled.

Barnato Group.

The following are the results of operations for April on the producing mines of the Barnato group:—

COMPANY.	STAMPS.	TONS.	REVENUE.	PROFIT.
Consolidated Langlaagte .	140	21,140	£30,471	£9,239
Ginsberg	80	14,076	21,808	7,022
Glencairn	160	19,505	16,624	2,779
New Primrose	160	24,400	35,994	18,192
New Rietfontein	120	14,951	20,835	3,938
New Unified	60	10,710	17,019	5,093
Quest	30	2,929	3,137	714
Witwatersrand	220	40,060	46,638	19,156
May totals	970	147,771	£192,526	£66,133
April totals	970	142,609	£184,089	£63,336

The monthly gross profits for 1912 are:—January, £59,227; February, £58,273; March, £61,223; April, £63,336; May, £66,133.

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of May are:—

COMPANY.	STAMPS.	TUBES.	TONS.	VALUE.	PROFIT.
May Consolidated ...	100	—	14,170	£17,332	£6,106
Princess Estate ...	60	5	18,900	24,455	605
Lancaster West ...	100	3	22,700	25,644	3,019
Geduld	50	2	15,120	19,218	4,525
	310	10	70,890	£86,649	£14,255

THE WEEK IN THE SHAREMARKET.

Dull and Featureless—A Quiet Ending.

Despite the very favourable statements made at the company meetings of the week, the market has remained dull and uninteresting. Buying from Paris is responsible for firmness in Modderfonteins and City and Suburbans; but otherwise, though prices were maintained, little business was done. Diamonds and tin stocks suffered from similar neglect, though the latter are looked to for the next spurt of activity. The dividend declarations will be out in a few days, and will no doubt have a good effect. An improvement may also be looked for when the full report of Mr. Schumacher's speech at the Rand Mines, Ltd., meeting reaches London.

	* Friday, 31st.	* Sat., 1st.	* Monday, 3rd	* Tuesday, 4th.	Wed., 5th.	Thurs. 6th.
African Farms	...	16 9	16 3B	16 6	16 6B	16 6B
Adair-Usher Process	.	1 0B	1 0B	...	1 6S	1 0B
Apex Mines	..	35 3B	35 0B	36 6B	...	35 0B
Bantjes Consolidated	...	24 3B	24 9	24 3B	24 3B	24 3B
Benonis	...	6 9	6 7B	6 3B	6 3B	6 3B
Bushveld Tins	...	1 1B	1 1B	1 2B	1 2B	1 1B
Brakpan Mines	..	78 0B	80 0S	78 0B	79 0B	78 0B
Blaauwbosch	...	..	25 0	24 0S	...	...
British S A.	...	27 6B	...	28 9S	28 9S	...
City and Suburban	...	52 3	52 0B	52 6B	52 6B	53 0
City Deeps	..	58 0B	58 6B	58 0B	58 0B	...
Cloverfield Mines	...	6 4	6 5B	6 3	6 0B	6 0B
Cons. Langlaagtes	...	23 3	23 0B	23 3	23 3	22 9B
Cons. Main Reefs	..	19 9B	19 6B	19 9	19 9	19 6B
Coronation Freeholds	...	0 7B	...	0 9B	0 7B	0 7B
Con. Investment	...	22 0B	22 0B	...	21 6B	21 0B
Concrete Cons.	...	10 0B	...	10 0B	..	...
Clydesdales	...	...	10 0B	10 0B	10 0B	10 0B
Cons. Mine Selections	...	13 6B	..	...	...	...
Crown Diamonds	...	5 0S	...	...	5 0S	...
Crown Mines	..	...	137 6B	137 6B	137 6B	...
East Rand Cent.	...	9 0	9 6	11 3	12 6	12 3
East Rand Coals	..	2 5B	2 5B	2 5B	2 6S	...
East Rand Deeps	...	2 3B	2 3B	2 9	...	2 6B
East Rand Props.	..	62 6B	63 0	62 0B	62 0B	61 0B
East Rand Deb.	..	£94½	£94	£94	£94	£94
Eastern Gold Mines	...	1 9B	2 0S	1 9B	...	1 10
Frank Smith Diam	...	8 0B	9 3S	7 6B	8 3B	8 6B
Govt. Areas	...	26 0B	26 0B	26 0B	26 0	26 3
Glynn's Lydenburgs	...	27 0S	...	...	23 9B	..
Geduld Props.	...	22 6B	...	22 0B	...	...
Ginsbergs	...	28 9B	28 9B	28 9B	28 9B	28 0B
Glencairns	...	4 0B	4 3B	4 0B	5 0S	5 0S
Jumpers	...	...	11 0B	...	10 3B	11 0S
Jupiters	...	12 6B	12 6B	12 6B	12 6S	...
Kaalfontein Diamonds	...	0 8B	0 9S	...	...	0 8S
Klerksdorp Props.	..	3 3B	3 3B	3 3B	3 2S	3 3
Knight Centrals	...	15 6	15 6B	15 3B	15 6	15 3
Luipaardsvlei Estates	...	...	...	8 6S	...	...
Lace Props.	...	3 4B	3 6B	3 7B	3 7B	3 9B
Lydenburg Gold Farms	...	9 0	9 1	9 0B	9 0B	9 0
Main Reef Wests	...	27 0B	26 0B	26 9	...	26 0B
M.R. West Deben.	...	£100	...	£99½	...	...
Modder B's	...	57 9	58 0B	59 0	...	57 0B
Midas Deeps	...	0 6B	...	0 6B	0 7S	0 7S
Middelvlei Estates	...	1 10B	1 9B	1 9B	1 9B	2 0S
Modder Deeps	...	30 0B	31 6B	31 0	30 6B	30 6B
Meyer & Charltons	...	91 0B	91 0B	91 0B	91 0B	91 0B
Natal Nav. Colls.	...	16 8B	16 3B	17 0S	...	...
New Eras	...	8 7	8 6B	8 6B	8 10	8 9B
New Kleinfonteins	...	28 9B	28 6B	28 6B	28 3	28 0B
New Rietfonteins	..	10 6S	...	9 9B	..	9 0
New Unifieds	...	..	17 6B	...	18 0B	18 0
New Boksburgs	...	...	...	1 9B	1 9B	1 9B
Nigels	...	16 0B	15 0B	17 6B	..	...
Orange Diamonds	..	1 4B	1 9S	1 3	1 0B	1 4B

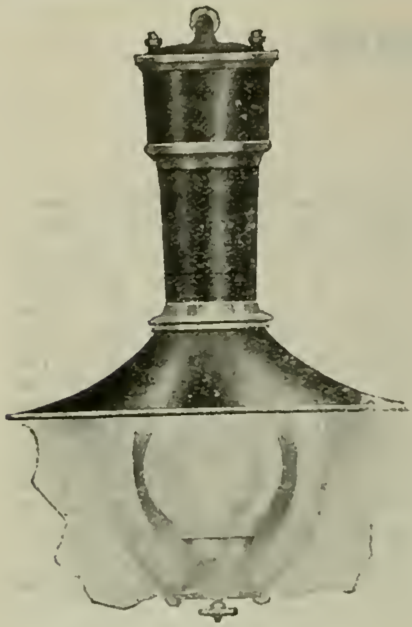
B Buyers. S Sellers.

	Friday, 31st.	Sat., 1st	Monday, 3rd.	Tuesday, 4th.	Wed., 5th.	Thurs. 6th.
Premiers Deferred	...	184 0B	183 9B	...	...	186 3B
Pretoria Cement Co.	...	58 0	57 0B	57 0	57 0S	56 6
Paardekraal Estates	...	0 9B	0 9B	0 9B	0 9B	0 9B
Princess	...	10 0B	10 0B	...	10 0B	10 0B
Rand Nucleus	...	3 0B	3 0B	3 0B	3 0B	2 11B
Randfontein Estates	...	28 6	28 6	28 3B	28 3B	27 9B
Randfontein Deeps	...	4 0B	4 0B	3 10B	3 9B	4 0B
Rooiberg Minerals	...	38 0B	38 6	38 9B	39 0	38 0
Rand Klips	...	6 11	6 11	6 9	6 9B	6 9B
Ryan Nigels	...	4 0B	4 0B	4 0B	4 0B	4 0B
Rood. Durban Deeps	...	27 0B	27 0B	27 0B	26 6B	26 6B
Roberts Victors	...	18 0B	...	...	...	...
Rose Deeps	...	66 0B	...	66 0B	...	...
Robinson Deeps	...	50 0B	...	...	...	53 0B
Simmer Deeps	...	4 0S	4 0S	...	4 0S	4 0S
South African Lands	...	4 5	4 4B	4 0	4 8B	4 7
S.A. Tin Mines	...	...	9 0S	7 6S	7 6S	6 6B
S. Randfontein Deeps	...	3 0S	3 6B	3 0	...	4 0S
Sub Nigels	...	...	. .	...	6 0S	6 0S
S. A. Breweries	...	...	40 0B	41 6S	41 0S	40 0B
Springs Mines	...	15 6B	...	15 3B	15 3B	15 3B
Trans. G.M. Estates	...	45 0B	46 0B	46 0B	47 0	47 6B
Temple Tins	...	3 4	3 4B	3 6B	3 6B	3 6B
Trans. Coal Trusts	...	49 3	48 3B	48 3	49 0B	48 9
Trans. Cons. Lands	...	...	...	..	30 0B	...
Tudors	...	1 0B	2 0S	...	2 0S	1 0B
Van Ryn Deeps	...	20 3B	20 0	20 3B	20 0B	20 3B
Village Deeps	...	42 6B	42 0	41 9B	41 6B	41 6B
Village Main Reefs	..	52 6S	...	...	...	...
Vogel. Cons. Deeps	...	0 9B	1 0B	1 0B	1 0B	1 0B
Voorspoed Diamonds	...	10 0B	10 0B	10 0B	10 0B	10 0B
Van Dyks	...	...	2 0B	2 0B	...	...
Witwatersrands	...	...	...	...	...	56 0B
Wolhuters	...	20 6B	20 6	20 0B	20 6	20 3B
Witbank Collieries	...	40 0B	40 0B	40 0B	...	...
Wit. Deeps	...	54 0B	...	53 0B	...	53 0S
West Rand Est.	...	...	2 9B	2 9B	...	2 9B
Zaaiplaats	...	46 0B	46 9B	47 0S	45 0	44 9B

B Buyers. S Sellers.

Tenders Accepted.

The following tenders have been accepted for the various services mentioned, viz.:—J. S. Hancock & Co., Ltd., Box 1930, Johannesburg, £315 19s. 9d., supply and delivery of sanitary fittings and materials to Pietermaritzburg Colonial Offices; R. Martin & Co., Nelspruit, Transvaal, £622 15s., erection of police buildings at Louws Creek, Barberton; J. Brand, Mosheshford Barkly East, £3,258 3s. 4d., erection of bridge over the Umhlonyana Spruit, Newcastle, Natal; J. Brand, Mosheshsford, Barkly East, £3,129 9s. 2d., erection of bridge over Klip Spruit, Newcastle, Natal; Fraser & Son, Ltd., Bloemfontein, for the supply of leather bags to the Department of Posts and Telegraphs, at 13s. 6d. each; R. Grieve, Box 147, Krugersdorp, £1,810, erection of school and teachers' quarters at Kleinfontein No. 76, District Marico; for supply of mealie meal and forage to the Forest Department, Transvaal Conservancy: Messrs. Orkin Bros., P.O. Box 278, Pretoria: Belfast Plantation, 50 bags, at 10s. 6d. per bag of 180 lbs., f.o.r., Pretoria; Ermelo Plantation, 120 bags, at 10s. 6d. per bag of 180 lbs., f.o.r., Pretoria; Irene Nursery, 200 bags, at 10s. 6d. per bag of 180 lbs., f.o.r., Pretoria; Graskop Plantation, 90 bags, at 10s. 6d. per bag of 180 lbs., f.o.r., Pretoria; Jessievale Plantation, 140 bags, at 10s. 6d. per bag of 180 lbs., f.o.r., Pretoria; Lichtenburg Plantation, 90 bags, at 10/6 per bag of 180 lbs., f.o.r., Pretoria; Machavie Plantation, 80 bags, at 10s. 6d. per bag of 180 lbs., f.o.r., Pretoria; Pan Plantation, 120 bags, at 10s. 6d. per bag of 180 lbs., f.o.r., Pretoria. Forage:—Messrs. B. Mendelsohn, Ltd., P.O. Box 43, Boksburg: Ermelo Plantation, 12,000 lbs., at 5s. per 100 lbs., f.o.r., Boksburg; Machavie Plantation, 8,000 lbs., at 5s. per 100 lbs., f.o.r., Boksburg; Messrs. Orkin Bros., P.O. Box 278, Pretoria: Irene Nursery, 14,000 lbs., at 5s. per 100 lbs., f.o.r., Pretoria; Pan Plantation, 11,000 lbs., at 5s. per 100 lbs., f.o.r., Pretoria; Messrs. Orlek Bros., P.O. Box 744, Pretoria: Pan Plantation, 25,000 lbs., at 5s. per 100 lbs., f.o.r., Pretoria.



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THE OZONAIR SYSTEM OF VENTILATION.

An Idea Big with Possibilities for the Rand.

At the express invitation of the directors of Ozonair, Ltd., a representative of the *South African Mining Journal* recently paid a visit of inspection to some of the stations on the Central London Railway—the famous "Tuppenny Tube"—in which the Ozonair system of air purification and ventilation is installed. When it is stated that something like 80,000,000 cubic feet of cleared and ozonised air is pumped into the tunnels every day, it will be seen that the contract is a very important one. Yet the *modus operandi* is simplicity itself, and the actual cost of operation almost infinitesimal—it does not, indeed, exceed one six-hundredth part of a penny per cubic foot of strongly ozonised air. It is the contention of the patentees that their apparatus produces absolutely pure ozone, which is entirely free from any contaminating or harmful impurities, such as nitrous oxide, which at once neutralises the good effects peculiar to ozone. The success of the system on the underground railway cannot be questioned. By its use the atmosphere of the seven odd miles of tunnels, at a distance of anything between 60 and 100 feet from the surface, is rendered perfectly cool and clean—and kept so throughout the livelong day, notwithstanding the presence of the many thousands of people who frequent the Tube from early morning until midnight. It is estimated, indeed, that the Central London Railway carries every year no fewer than 40,000,000 people, so it is obvious that the system of ventilation in use should be absolutely thorough. By the Ozonair process the air is drawn in from the street, through metal gauze screens by aid of a fan (which is driven by an electric motor), and filtered in the process, the screens being kept moistened by means of a continual spray of water from a series of atomisers a distance of three feet away. This operation entirely absorbs the poisonous airs and deleterious gases which are peculiar to a great city like London. The cleansed air is then passed into a mixing chamber, where it is purified and partially sterilized by means of ozone. The volume of air and the proportion of ozone can be quite easily regulated by means of the switchboards which control each equipment. The air is distributed over the railway by means of galvanised mill steel ducts, but so carefully is this effected that draughts are avoided. Six or seven vertical ducts expel the air to each platform at a height of seven feet above the level of the floor, whilst larger branches from the main duct are carried about 40 feet, one along each of the two tunnels in the direction in which the trains run, to deliver air into the tunnels. The main ventilating fans are of the Sirocco pattern, and are driven in most cases by 7½ h.p. motors, the ozone generators being supplied with current at 5,000 volts from a transformer T fed at 380 volts A.C. from a small 550-volt rotary converter C. These 7½ h.p. motor equipments deliver from 5,500 to 6,500 cubic feet of air per minute; but at the stations at Holland Park and the British Museum the equipments are designed to deliver the still larger quantity of 12,000 and 23,000 cubic feet per minute respectively. It is clear that there is a big future before this valuable system of ventilation, which can be applied not only to railway tubes and tunnels but also to theatres and other buildings where people most do congregate, and also, of course, to mines and underground workings. We understand that before very long the proprietors of Ozonair, Ltd., will instal their apparatus for the purposes of demonstrating its fitness in one of the mines on the Rand. Messrs. Reunert & Lenz are the local agents.

Contracts Open.

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of 70 square iron tanks (June 26).

The Chairman, Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of the following services to the Department of Irrigation:—Specification, 1,460 standards, about 14lb. weight each, six holes, galvanised iron or steel, for fence of barbed wires; 4,360 droppers, to suit same fence; 204 rolls two-ply four-point barbed galvanised fencing wire, barbs 6 inches apart; 7 rolls binding wire (June 12).

The Chairman of the Union Tender Board, Box 371, Pretoria, invites tenders for the supply, delivery, and fixing in position where necessary, certain show cases, furniture and fittings, to the Public Museum at Bloemfontein (July 31).

The Chairman of the Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for the following services in the Transvaal Province: Alterations and additions to North School at Potchefstroom (June 28).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the supply of 600 posting books, required for use in the Customs Department (June 12); also for the supply, delivery, and fixing in position where necessary, certain furniture and fittings for the Post Office at Durban (June 19).

The Chairman of the Transvaal Provincial Tender Board, Box 1240, Pretoria, invites tenders for the erection of a school for 150 pupils at Krugersdorp West (June 14).

The Chairman of the Union Tender Board, P.O. Box 371, Pretoria, invites tenders for the following services, viz.: Erection of police buildings at Bushbuckridge, Maviljen No. 250 (June 12); drainage system and sewerage purification works at the Asylum, Fort Beaufort (June 12).

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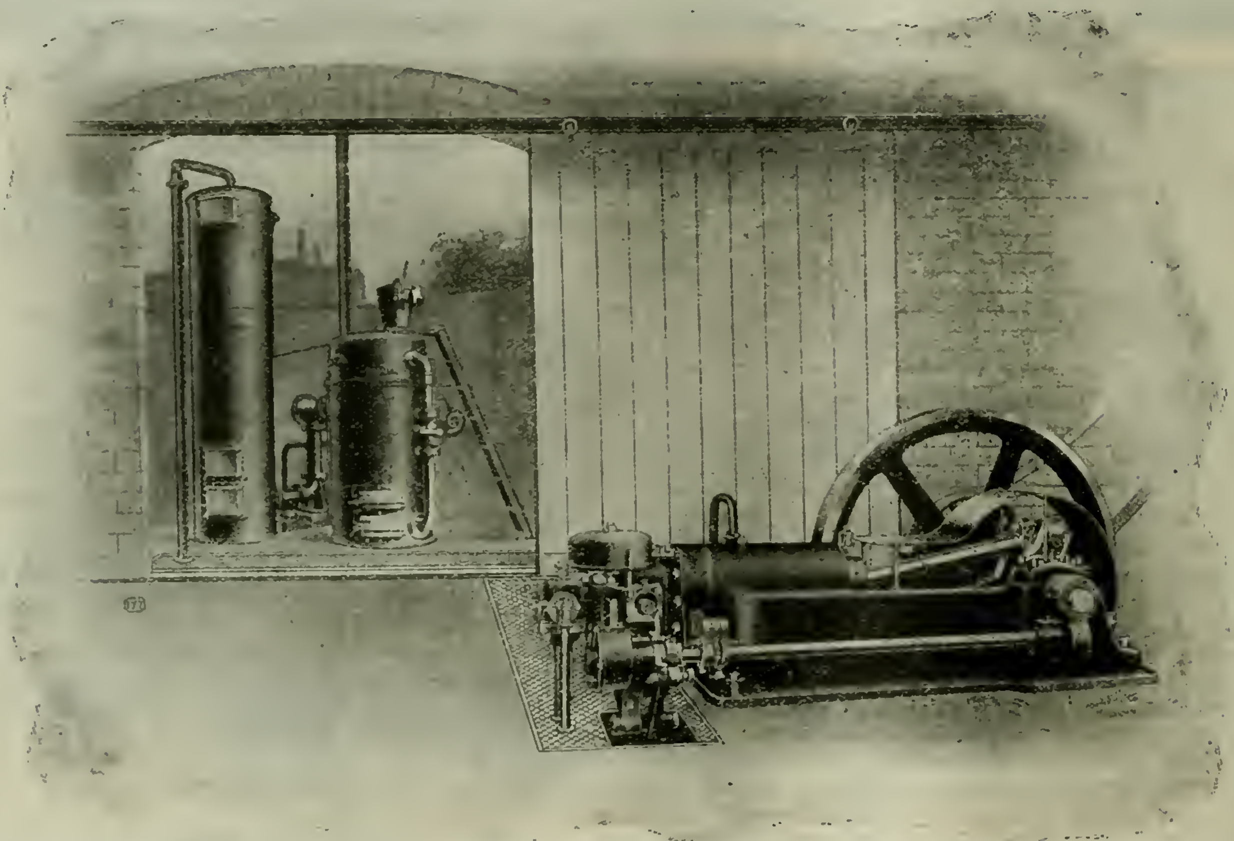

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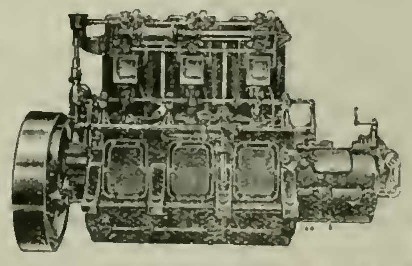

Electric Lighting Sets

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Finance, Commerce, and Industries.

The Public Trustee.

The annual report of the British Public Trustee shows a remarkable expansion of the work of the department. The business, says the *Incorporated Accountants Journal*, has come from all classes in England and Wales. Persons of means above the average have availed themselves as freely of the advantage of the Statute as any other class. It would seem that these value the security of the State guarantee, the economy of a permanent trustee, the freedom to nominate an executor or trustee who will certainly survive them, who from the measure of his success is necessarily highly skilled and experienced in his duties, and who, being remunerated, acts without any sense of personal obligation arising. Moreover, the fact that the fees are not to be profit bearing gives a mutual character to the department, so that those who resort to it assist each other in effecting a reduction in the cost of administration. It is undeniable also that the success which has attended the work of investment has proved an attraction.

* * * *

Scrap Iron Contract.

The report of the Select Committee on the scrap iron agreement, issued last week, consists of a majority and minority report. The majority report details the circumstances leading up to and the details of the agreement, and comes to the conclusion that the price for scrap iron is a fair one, and that inducements given to buy the finished products of the company was necessary, and did not constitute a monopoly. The report also considers that the final agreement with the Union Steel Corporation should not have been completed until the financial arrangements had been satisfactorily adjusted. Finally, the report regards the arrangement on the whole as a fair one, tending to form the nucleus of iron and steel development in the Union. The minority report is signed by Messrs. Meyler, Henderson, and Rockey, and sets forth at length the points whereon these members differ from the majority report, and comes to a number of conclusions, one of which was that there was no satisfactory reason why the agreement should not have been laid before Parliament before being completed, and that if the terms granted to Wright had been advertised there would have been more proposals. The report also considers the agreement constitutes a monopoly, therefore seriously handicapping present founders, and that it does not adequately provide for the development of South African ores. The report regards it as inadvisable for the Government to be represented on the board. In conclusion, the report states that the final agreement should not have been completed without the approval of Parliament.

* * * *

State Competition with Banks.

In the course of his speech at the extraordinary general meeting of shareholders of the National Bank of South Africa, Ltd., the Chairman, the Hon. Hugh Crawford, said, *inter alia*:—

I desire to offer a few remarks which are not exactly germane to the object of this special meeting, but we meet so seldom, and the subject I propose alluding to is so important to banks and the public generally, that the irrelevance may be overlooked. In one of our leading newspapers an article appeared last week under the heading of "Raising Capital in South Africa," which, if given effect to by the Government in every respect, might be fraught with results contrary to what the writer imagined. Briefly, he advocated the raising of loans in South Africa, and increasing the rate of interest allowed by the Post Office Savings Bank, and removing the restrictions to much larger sums being deposited. Now, gentlemen, it is well-known that the Government can borrow in the London market at lower rates than either banks, municipalities or private companies, and every loan so raised brings additional capital into the country. Were the Government to cease doing this and to compete for deposits through the Post Office Savings Banks by increasing the rates of interest paid and removing or largely increasing the limit on amounts that could be deposited, the deposits with banks might be seriously reduced, and consequently the commercial community, mining companies, farmers and the public generally who are now supplied by the banks with funds, might have their facilities curtailed. As long as the banks can allow the rates of interest they are and have been paying, the Government should not be invited or urged to encroach upon business that legitimately belongs to banks and other trading concerns, more especially as such action is not to the benefit of the community as a whole. The Savings Banks serve a useful purpose and no one desires to interfere with their proper functions or the excellent service they render to the frugal and industrious of small means, but our banks are also useful institutions in collecting from those who have money to spare and distributing to those who require money for legitimate purposes, and their domain should likewise not be interfered with except for good and sound reasons. The banks in South Africa are probably supplying about forty millions in this way, and their capital and reserves afford a good guarantee to depositors against possible losses.

* * * *

Reductions in Railway Rates.

The Committee of the Johannesburg Chamber of Commerce has addressed the Minister of Railways in reference to the announcement made in the House of Assembly of an impending reduction in railway rates. Attention was called to the importance of giving at least two months' public notice before such alterations take effect in order to minimise, as far as possible, the loss which inland merchants have to sustain in the realisation of stocks upon which the higher railage has been paid. The Minister was reminded that the Association of Chambers of Commerce has repeatedly urged this point upon the South African Railway Administrations, and assurances have been given that wherever possible such notice will be given. This letter has been acknowledged by the Minister, who states that the representations of the Chamber will receive consideration. The General Manager invited an expression of the Chamber of Commerce's opinion as to suggested alterations in the classification of machinery for railage purposes. Experience has shown that the list of component parts of machinery published on pages 204 and 205 of the Tariff Book is not sufficiently comprehensive, with the result that unnecessary correspondence is involved in queries and interpretations. The Department suggested that "machinery not mechanical power driven" should be under Rate 1, and "machinery—mechanical power driven (and component parts thereof)" under Rate 2; and, further, that to obtain the lower rate, a declaration should be required to be endorsed on the consignment note by the consignor. A deputation from the Committee waited upon the Assistant General Manager, and it was represented that the proposed alterations were undesirable, and would be more troublesome to carry out than the present arrangements. They would evidently mean a raising of the rate on many articles now classified with machinery, but which are not mechanical power driven. The deputation suggested that in the new Tariff Book machinery coming under Rate 1 should be specified, and that the remainder should fall, automatically, under Rate 2. The Committee has agreed to furnish the Railway Department with as complete a list as possible. Notice was received from the General Manager that, concurrently with the next issue of the Tariff Book, it is proposed to introduce the principle of calculating charges on the actual or computed weights of timber at the option of the Administration. The Committee has taken exception to this proposal, and has pointed out that merchants would not be able to give definite quotations for timber, including delivery, without running considerable risk of loss.

* * * *

Britain's Trade with the Union.

The following is a statement supplied by the British Trade Commissioner's Office, Capetown, covering the external trade of the United Kingdom for the first quarter of 1912, with special reference to British South Africa: The recently-issued "Accounts relating to the trade and navigation of the United Kingdom," for the three months ended March 31, show that the values of the merchandise imported into and exported from the United Kingdom during the three months were as follows: Imports, £187,888,000; exports, £149,807,000; United Kingdom produce, £118,621,000; foreign and colonial produce, £31,186,000. Each of these totals is greater than the corresponding total for the first quarter of any previous year, the increases, as compared with the figures for the first quarter of 1911 (the highest previously recorded), being: Imports, £10,613,000, or 6·0 per cent. Exports: United Kingdom produce, £4,373,000, or 3·8 per cent.; foreign and colonial produce, £3,376,000, or 12·1 per cent. The figures for the first quarter of the present year are no doubt affected to some extent by the coal strike; but it must be borne in mind that although the strike began on March 1, the industries of the country did not, in many cases, feel its effects for some time, whilst the records of external trade are somewhat in arrear (probably by about a week on the average) of the actual transactions. Thus, even the more immediate effect of the strike is not fully reflected in the March records. There is also some reason to think that the effect of the strike was more marked on the home trade of the United Kingdom than on its trade with foreign countries, the Dominions and the Colonies. The figures quoted above relate to merchandise only; they do not include imports and exports of gold and silver. The total value of these (including bullion and specie) during the three months ended March 31st was: Imports, £16,700,000; exports, £16,200,000. The value of the imports and re-exports to British South Africa during the first quarter of each of the years 1911 and 1912 were as follows (values of merchandise only, exclusive of diamonds and gold):—Imports: 1911, £2,668,000; 1912, £3,457,000. Exports: United Kingdom produce, 1911, £5,579,000; 1912, £5,876,000; re-exports, 1911, £469,000; 1912, £501,000. There was thus a substantial increase in imports, and smaller increases in exports. Among the principal articles were the following: Imports from British South Africa into the United Kingdom during the first quarter of 1912: Wool (sheep's or lambs'), £1,997,000; mohair (Angora goats' hair), £197,000, skins (goats' or sheep's), £274,000. Exports of United Kingdom produce to British South Africa during the first quarter of 1912: Iron and steel and manufactures thereof (so far as distinguished in the monthly accounts), £638,000; machinery (so far as distinguished similarly), £434,000; cotton piece-goods, £321,000; apparel, £904,000; boots and shoes (of leather), £276,000. The value of the gold bullion imported from British South Africa during the first quarter of 1912 was £9,711,000, as against £8,673,000 during the same period of 1911

* * * *

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JOHANNESBURG.

Contracts Open

The Municipal Council of Johannesburg invites tenders for printing and binding of Council's estimates for period of three years (June 6).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of imported wines, spirits, mineral waters, etc.; imported spirits, etc., in miniature bottles; cigarettes and tobaccos. Supplies are required for the Railway Catering Department in the Province of the Cape, Transvaal, and Orange Free State (June 11)

The Secretary to the Tender Board, South African Railways Headquarter Offices, Johannesburg, invites tenders for the supply of 60 lb. and 80 lb. section rails and fastenings to drawings, Type E.100 and E.200 (July 2)

The Rand Mines, Ltd., Buying Department, Box 1594, Johannesburg, invites tenders for the supply of the whole or any portion of the requirements of mealies to the Companies controlled by the Rand Mines, Limited, for a period of twelve months from 1st July, 1912.

The Buying Department, Farrar Anglo-French Group, Farrar Buildings, Johannesburg, invites tenders for the supply and delivery of sound new season's (1912) white mealies to the mines of their Group.

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of oils (June 11); also for bridgework to form extension of foot bridge, Witbank (June 11); also for the supply of 36,000 casks of Portland cement (June 18); also for the supply of writing and printing paper, boards, etc. (June 9).

The Secretary to the Tender Board, S.A.R., Headquarter Offices, Johannesburg, invites tenders for the supply of 2,741 Petersburg standards of Baltic timber (June 11).

The Municipal Council of Johannesburg invites tenders for spares for stone crusher (June 14).

The Municipal Council of Johannesburg invites tenders for the supply of sanitary pails and lids (August 2nd), licence plates and badges (2nd August), steam piping (June 28), rolled steel joints (June 13); also for the supply and deilvery of a number of electricity meters (June 12).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of 904,625 hardwood sleepers or (alternatively) creosoted Baltic sleepers (July 23).

The Municipal Council of Krugersdorp invites tenders for the supply of steel water pipes, etc., for the period from 1st July, 1912, to 30th June, 1913 (June 13).

The Municipality of Benoni invites tenders for the erection of fire brigade station and quarters, and additions to Municipal offices (June 19); also for the supply of licence plates and badges for the year 1913 (June 27).

The Municipality of Boksburg invites tenders for the supply of rolling stock, converter plant, and overhead material, required in connection with trackless tramways (June 26).

The Chairman of the Tender Board, Provincial Secretary's Office, Bloemfontein, invites tenders for the erection of a bridge over the Modder River (June 11).

The Corporation of Pietermaritzburg invites tenders for the supply of one steam turbine with tandem generators, switchboard, and condensing plant (July 29).

The Chairman of the Tender Board, Attorney-General's Office, Pietermaritzburg, invites tenders for the reconstruction of Prince's Bridge, Umgeni River (Albert Falls), (June 24).

The Chairman of the Tender Board, Attorney-General's office, Pietermaritzburg, invites tenders for the erection of a bridge over the Slang River (June 10).

The Municipality of Frankfort, O.F.S., invites tenders for the supply and erection of the pipe services and machinery in connection with the Town Water Supply (July 4).

Messrs. Gibson & Robertson, architects, Main Street, Bulawayo, invites tenders for the erection of new post, customs, and Municipal offices on a site having frontages to Main Street and Selborne Avenue, Bulawayo (June 29).

The Municipality of Ladismith, Cape Province, invites tenders for the supply of six inch steel pipes and other incidentals thereto for the proposed water scheme (July 15).

The Chairman of the Tender Board, Provincial Auditor's Office, Capetown, invites tenders for the erection of a bridge over the Klip River at Swellendam, Cape Province (July 3).

INVESTORS' DIARY.

The following company meetings have been announced:—

June 21.—New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M.; New Unified; Van Ryn Deep; Government Areas; Glencairn.

June 26.—Transvaal Consolidated Lands.

June 28.—A Goerz & Co.

July 19.—Transvaal Consolidated Lands.

Mr. Friedrich Eckstein has been appointed chairman of the Central Mining and Investment Corporation, Ltd., in place of the late Sir Julius Wernher.

The recent publication of the Publicity Association, "Farm Lands of the Rich South-West," has aroused a great deal of interest in Johannesburg regarding the possibilities of farming on a small scale. This is evidenced by the numerous inquiries which are being received by the Society for particulars as how best to secure small farms of about 50 or 60 acres for fruit farming or tobacco growing.

Our Twenty-First Anniversary Number.

THE LAST WORD ON RAND MINING.

To commemorate the twenty-first anniversary of the founding of this journal, a special number, distinct from the ordinary weekly issue, will be issued in July next. Fittingly to mark the occasion, the number will contain a comprehensive and concise account of the past history, achievements and present position of every gold mine on the Rand, illustrated and brought down to the latest possible date. It will review the industry generally as well as in its several technical aspects, and will include articles by experts on the chemical, mining and metallurgical progress and problems of the fields. A feature will be made of the personal side of the industry, and a section will be devoted to its technical and administrative leaders, enriched with portraits and other illustrations. Engineering on the Rand in all its phases, electricity, steam and air power will be treated, and the growth and progress of electric power supply will be exhaustively discussed. The gold mines of the outside districts and the tin, copper and coal industries of those districts will be dealt with thoroughly and at first hand. The great diamond industry of South Africa will have a section to itself, and here, as in the treatment of the base metal industries, the letterpress will be embellished with many striking and original illustrations. Mining in the Cape, Natal and Orange Free State Provinces will also be reviewed and the undoubtedly great mineral potentialities of those, as yet undeveloped, areas will be graphically set forth. German South-West Africa will find a place in the issue and a first-hand account of the diamonds, the copper and the tin mines of that promising field will be included. Moreover, the banks and other great financial institutions, the railways and harbours of the sub-continent will be adequately dealt with, and the whole problem of transportation as it affects the inland industrial centres will be reviewed. In this connection Capetown, Port Elizabeth, Durban, East London, Delagoa Bay and Beira will be separately and fully treated and their claims examined. Apart from mining, there will be a considerable section devoted to a description of the several subsidiary industries dependent on mining for a market. Chief among these will be cement, explosives, soap and candle-making, milling and the hundred and one activities that centre in the Rand. Rhodesia and Mozambique will be given a separate and extended treatment. The different mines will be described and illustrated, and the recent progress of the industry in those territories dealt with comprehensively and lucidly. In addition, the issue will contain a number of interesting and valuable contributions from leading men in the mining and financial world, many of whom have already sent their congratulations on the decision to issue a special commemorative number of the journal. Numerous letters received from past Rand engineers and mine managers, now resident in all parts of the world, contain offer of contributions. These will form a unique collection of valuable views and reminiscences, and will considerably enhance the interest of the volume. The work will consist of upwards of 350 pages, printed throughout on art paper. Prizes are offered to artists for the best design of a suitable and striking character, and particulars are given in another part of this issue of other valuable prizes to be awarded in connection with the number. It may be added that the work will be prepared, produced and printed in South Africa, and will aim to cover the whole field of mining in this country, and to prove a fitting monument to the great industry with which, from the beginning, the *South African Mining Journal* has been associated. The co-operation of everyone interested in the industry is being enlisted to make the venture a success, and already it promises to mark an advance on anything of its kind ever before attempted in South African illustrated journalism.

Three facts regarding the Transvaal worth remembering:

(1) The Transvaal is producing over one-third of the world's gold output.

(2) Transvaal mines have spent 24 millions sterling on machinery and plant.

(3) The *South African Mining Journal* is the official organ of the Mine Managers' Association.

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Automobile Notes.

The Reyersbach Trophy.

The competition for the Reyersbach Trophy—the blue riband of the Automobile Club—will be held on the 30th inst., on the Krugersdorp-Rustenburg road. The race this year, a one-day event, will consist of the outward run to Rustenburg and return to Krugersdorp, entailing for the round trip a distance of approximately 130 miles. It will be remembered that on former occasions this race occupied two days. The Reyersbach this season is being characterised by an innovation which provides for a separate competition being held for American cars, being run simultaneously with the race proper. A separate prize, however, is being offered in connection with this new departure by the Continental Tyre Co. Already much interest has been aroused in this important event, in which speed is largely the determining factor, and it is hoped that the support accorded it, in point of entries, will eclipse even that on former occasions.

The Trapping Crusade.

The repulsion with which the motoring public views the trapping crusades was exemplified by the many letters, couched in undoubtedly aggrieved tones, which have appeared in the Press in regard to the recent outlet of official zeal in the endeavour to trap motorists. Without appearing, however, to criticise in caustic fashion, or unduly condemn the actions of the authorites in this direction, one is forced to the conclusion that the time devoted to this most unpopular practice by the police could be employed to advantage in the detection and suppression of crime, which after all is of paramount importance to the community. It may be suggested that the motorists themselves wage a crusade, having for their objective the capture of the motor "hog," who is so largely responsible for instigating the action of the authorities in trapping. Weed out this undesirable element from among the motorist ranks and the solution of the "motor peril" problem will be satisfactorily apparent. How best to accomplish this end may be determined by concerted action on the part of self-respecting motorists, who might be called upon to report offending "hogs," whenever occasion arises, at the nearest police station, by submitting the number of the car suspected of violating the bylaws, and, whenever possible, rendering the respective name of the owner or driver. The authorities in turn could keep a special look-out for delinquents so reported, and endeavour to procure a conviction, bringing to bear in this

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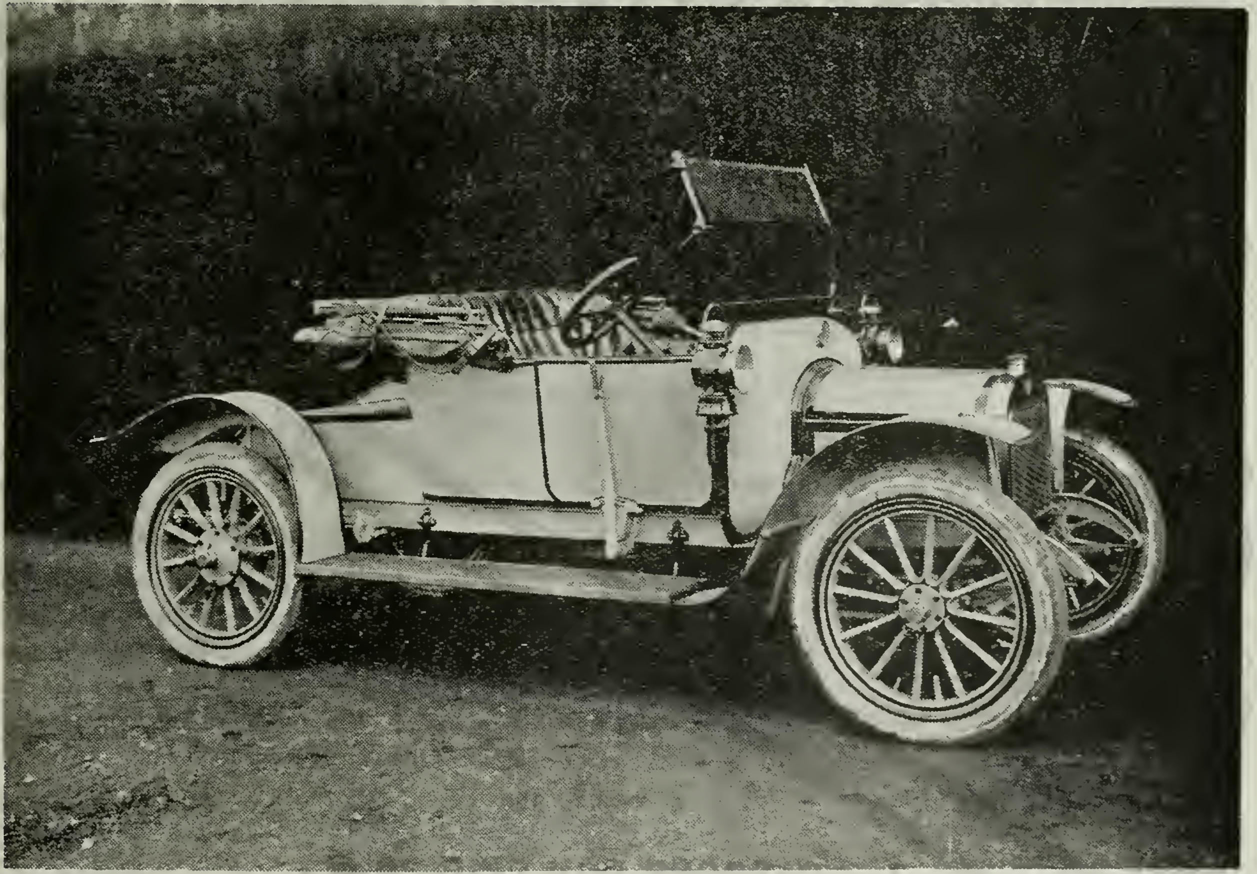

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respect the additional weight of evidence supplied by the law-abiding motorists who were indirectly responsible for the charge. Were all motorists leagued with the foregoing, briefly outlined, object in view, the necessity—which will be accepted for sake of argument—which exists, for the laying of traps would vanish appreciably.

A Rand-Durban Road.

Motorists are jubilant at the prospect of the grand trunk road from the Rand to the coast (Durban) assuming concrete form at an early date now that the Government has been induced to recognise the claims of the country in this respect. That the coast watering places, which, by the way, at present are linked up by very creditable roadways, will benefit to a great extent by the scheme, goes without saying, while the several important centres *en route* will also benefit considerably by the volume of traffic which the scheme is destined to attract. Motorists, who are perhaps more intimately interested than the general public in this great roadway, have for long agitated for its construction, and are naturally proud of the result of their constant appeals, as aforementioned. The prospect of a clear run from the Rand to Durban, however, is, what may be termed, so fascinating, that the actual fulfilment of this ideal dream is even now, despite the promised practical recognition by the Government, a dubious point in the minds of many motorists. The scheme nevertheless has never appeared so rosy. It may be mentioned that an ideal stretch of road at present connects Pietermaritzburg and Durban—appreciated to the full by the Eastern Province motorists—the only portion loudly calling for construction being the larger section from Johannesburg to the eastern capital. The Transvaal Automobile Club are certainly deserving of the gratitude of the great army of South African motorists for the unremitting efforts put forward, in regard to the opening up of this extensive highway, and are to be congratulated on the attendant success. It is understood that the important matter of the erection of sign-posts at the numerous cross roads, having a bearing on the Rand-Durban route, will be included in the scheme under preparation, which is by no means the least significant feature of the undertaking from the motorist's standpoint.

The Car for South Africa.

Much has been written on the essential qualifications of a car for use in this country, often, however, without due regard to the unique climatic conditions prevailing, to which a machine must be adapted to merit any serious consideration. Manufacturers many thousand miles from the destination of the " Colonial " car cannot be credited with a grip

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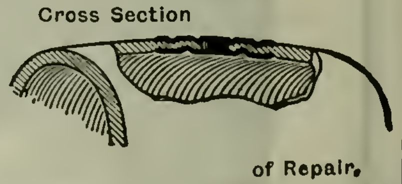

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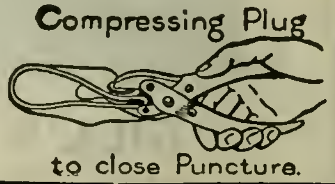

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of the actual requirements, and depend largely, if not entirely, on the agent's instructions. When the representative is of the real live order, the respective cars he represents will naturally conform to standard colonial requirements; under other circumstances machines may be marketed with a view to fulfilling certain conditions with very little claim to recommendation.

The interest of motorists at present is directed to the annual racing events, when conditions are often exacted, the carrying out of which reflects the actual merits of competing cars. It would be interesting, however, were an event arranged in which cars had to compete in the condition they are sold—i.e., "stock"—to the public. The agents very probably would be spared much of the valuable time now occupied in tuning-up, were competing cars picked promiscuously by, say, the Transvaal Automobile Club—the body under whose auspices the several events are held—from the agents' stock. This proceeding, while having much to recommend it, would not be fruitful of much benefit to the public—whose cause it is purposed to champion for the nonce—in that the stocks carried locally are practically infinitesimal, so to speak, when comparisons are attempted in regard to the show rooms in the different countries of manufacture. On the other hand, many cars within the writer's knowledge are so finely tuned for racing and other contests that they do not do themselves actual justice.

Motor Desperadoes.

The press of late, especially in France, has been filled with the accounts of the depredations of motor desperadoes, until a veritable reign of terror was established on the continent and elsewhere. This led a motorist in England, who was charged with exceeding the speed limit, driving to the public danger, and other charges, to put forward what he thought an ingenious defence, which is worth re-telling. His story was that he was under the impression he was being held up by "motor bandits," when the police challenged him to stop, and this conviction he alleged was further upheld, when two plain clothes constables followed him on bicycles, all the time using every device to stop his career. The magistrate, unfortunately for him, took quite a different view of the case, and the absurd argument failed. The strangest part of the episode, however, was that the charge of exceeding the speed limit was dismissed, and the motorist fined £5 for refusing to stop. The law, on the other hand, is quite as absurd as the defence put forth in dismissing the charge of reckless driving. The recital apparently of the ridiculous chase was too much for the magisterial sense of humour.

Rand Water Board.

The Rand Water Board have just placed an order with Messrs. Bellamy and Lambie, the agents for Messrs. George Kent, Ltd., of London, for an 18in. "Venturi" Water Meter. This will make the seventh large "Venturi" Meter in use by the Board. Messrs. George Kent, Ltd., have also secured the order for the large meters to be used in connection with the Salisbury (Rhodesia) Water Scheme.

Our Special Issue.

Owing to delay in the arrival of supplies of paper, caused by the strike in Great Britain, and for other minor reasons, it has been decided to postpone the issue of the Special Majority Number of this journal—which will be separate from the ordinary weekly issue—until July. This will have the additional advantage of making it possible to include in the issue complete annual reviews of the results from all the mines, as by then the last of the postponed annual meetings of Rand companies will have taken place. Those contributors who had not yet sent in their promised articles will note that the delay gives them the desired time to apply the finishing touches to their work. In case we have overlooked acknowledging receipt of any articles sent in, we take this opportunity of thanking their contributors.

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The Week's Company Meetings.

RAND MINES.

MR. SCHUMACHER'S REVIEW

Industrial Questions.

The Outlook.

Authoritative Views.

Future of Deep Levels.

The seventeenth annual ordinary general meeting of shareholders of the Rand Mines, Ltd., was held on June 5th in the board-room, Corner House, the chair being taken by Mr. Raymond W. Schumacher. There were also present Messrs. H. C. Boyd, G. Sonn, H. Daniel, F. W. Baxter, W. H. Dawe, J. E. Allingham, E. Chappell, H. A. Rogers, H. Eckstein, E. A. Wallers and E. Renaud, with Messrs. S. Evans, F. Raleigh (financial manager), and the joint secretaries, Messrs. H. A. Read and S. C. Steil. There were 334,231 shares represented, apart from 260.000 shares held in the name of the late Sir Julius Wernher. The share issue is 2,125,995.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: I beg to present to you the reports and accounts for the year ending the 31st of December, 1911. This meeting, which was originally called for the 27th of March, was adjourned until to-day, in order to afford European shareholders ample time to study the reports before sending their proxies for the annual general meeting. It is our intention to continue to offer these facilities to European shareholders, and the annual meeting of the Rand Mines, Limited, and of the mining companies connected with it, will in future be held towards the end of May and early in June.

It will be necessary to call special general meetings of shareholders in the case of several of the mining companies in order to amend the articles of association accordingly, and advantage will be taken of this opportunity to bring the articles of these companies up-to-date generally.

The net profit for the year under review was £1,117,408; and two dividends, each of 110 per cent., absorbing £1,169,927 5s., have been paid. The balance carried forward amounts to £682,642, as compared with £1,006,398 brought forward at the beginning of 1911. The reduction is largely due to the purchase of investments for cash in respect of which £271,866 has been appropriated. The total amount paid out to shareholders in dividends and bonuses from the inception of the company up to the end of 1911 amounts to £7,889,755.

Share Transactions.

A number of important share transactions have taken place during the year under review. The first purchase involved the issue of 48,344 Rand Mines 5s. reserve shares, which were issued in payment for certain interests in Booysens Estate, Limited, South Deeps, Limited, and Turffontein Estates, Limited, as well as for shareholdings in various gold mining companies mentioned by me at the last annual general meeting. Further interests in the Booysens Estate, Limited, South Deeps, Limited, and Turffontein Estates, Limited, were purchased from other parties in exchange for 2,987 Rand Mines 5s. reserve shares. These purchases were finally completed early in June, 1911. A further and more important acquisition of shares, involving the increase of the company's nominal capital of £550.000, was ratified by the shareholders of the Rand Mines, Limited on the 19th of June, 1911. It was agreed to issue 207,999 5s. reserve and newly created shares of this company to Messrs. Wernher, Beit and Co. in exchange for important shareholdings in the following companies: City Deep, Limited, Modderfontein B. Gold Mines, Limited, East Rand Proprietary Mines, Ltd., New Modderfontein G.M. C., Ltd, Crown Mines, Ltd., Banties Consolidated Mines, Ltd., Village Deep, Ltd., Main Reef West, Ltd., Government Gold Mining Areas (Modderfontein) Consolidated, Ltd.

These 207.999 shares while ranking for dividends, distributions and rights after 1st January, 1911, are not to be negotiable until 31st December, 1913. Altogether 259.330 shares were issued during last year in exchange for assets that were acquired. We also paid £348,530 in cash during the year for a number of other assets, of which the most important were: 7,559 shares in the Crown Mines, Ltd., 5,000 shares in the New Modderfontein G.M. Co., Limited. £33,960 5 per cent. debentures of the East Rand Proprietary Mines, Limited, 82,125 £1 shares in the General Estates, Ltd., a company which has a capital of £225,000 and whose chief asset is the important nine storey building in which our head offices are situated.

The nominal capital of the Rand Mines, Ltd., stands to-day at £550,000 in 2,200,000 shares of 5s. each, of which 74,005 shares are in reserve. The issued capital of the company, therefore, is £531,498 15s. in 2,125,995 shares.

Reserve and New Shares.

It will be seen from the balance sheet that the premium of £2,061,740 which was created in respect of the reserve shares and new shares issued last year, has been written off the purchase price of the shares acquired which have been brought into the balance sheet at the par value of the shares given in exchange, that is £64,832 10s. The whole of the company's important holdings in shares and debentures stand in the balance sheet at the 31st December, 1911, at the low figure of £3,568,425 which, as you know, is greatly below their intrinsic value.

The sales of shares during the year 1911 were unimportant, and consisted chiefly of 55.000 £1 shares in the Wolhuter Gold Mines, Ltd. I must add that we have quite recently sold our company's holding of 47,500 £1 shares in the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd., our object being to concentrate our resources and our energies on the companies which we ourselves control.

I referred at some length in my annual address last year to the general policy that we were following and that we intended to continue to follow with such modifications as might appear desirable from time to time. I stated that we were very hopeful about the future of these fields, about the continuity of the gold reefs, of the reef values, and about the profits to be won. I emphasised the fact, though, that we should have to struggle laboriously to attain the improvements which we felt we could already foresee. We had to go carefully step by step, and leave no weak link in the chain of measures that we firmly believed would ultimately command success. We had to begin at the beginning and make our mines safer than they had been. Towards this end we started the important process of sand filling. We were guarding against possible inrushes of water, and consequent serious stoppage of mining operations, by strengthening and concentrating our underground pumping plants. We were improving the ventilation of the mines and the health conditions of our workers, both white and black. We were carrying out active plans of development, and rendering a larger number of stope faces available. We were extending the system of single shift underground. We were taking steps to ensure the safety of the main shafts, and were increasing their capacity. We were simplifying and rendering more efficient the methods of handling ore underground and on the surface. We were training white learners in all departments of work. We were, owing to the lack of native labour, extending the use of machine drills, especially of small machines. We were spending large sums of money on the electrification of the mine plants so as to obtain a cheap, ample and regular supply of electric power and compressed air, for which we had entered with the Rand Mines Power Supply Company into long contracts, of which you were given full details. We were striving for better and more efficient work in all departments. We were paying special attention to the feeding, housing and general care of all our employes. And I told you that as a result of our deliberate and sustained efforts we were found to improve results.

Record for 1911.

You will now ask me: What have you done in 1911? I will give you the answer. We have only had time to achieve partial success. We have, though, already improved, and we think permanently improved, the working conditions of some of our important mines, and these improvements are indicative of further progress that is to follow. At other mines we have not been able to make as rapid an advance; conditions everywhere are not equally favourable, and in some cases more time is required to achieve success than in others; but everywhere the signs are not wanting that we are working on right lines. I will deal first with the mines where the better results are most marked—mines that are already working at ease, if I may use the expression; that is, without constant and undue pressure, which is never conducive to good work.

Individual Mines.

The Rose Deep increased its profit from £315,276 in 1910 to £349,030 in 1911, in spite of a material decrease in the labour supply, and slightly increased dividends are now foreshadowed. The total ore reserves at the 31st of December, 1911, amounted to 3,670,160 tons. Good results should be obtained during the rest of the life of this company. We own 269,224 Rose Deep shares.

The Village Deep also shows marked improvement. The profit for 1911 amounted to £225,780, as compared with £154,067 in 1910. This is the result of the active policy of development work by which the Village Deep is fast becoming a great mine. The mine is on single shift and is worked with ease. In fact, the mine is in a position to supply a larger tonnage of ore to the mill than it is now doing. An increase in the rate of dividends should take place. We own 114,990 Village Deep shares.

The New Modderfontein shows improvd results, with a profit of £370,562 for 1911, as compared with £312,958 for 1910. The ore reserves at the 30th of June, 1911, were calculated at 3,452,195 tons of high grade, and development values have since been most satisfactory. The management is now considering the question of gradually concentrating mining operations to as small an area as possible until it commences to work on a larger scale. At present the workings are too scattered. The effect of concentration should be to increase the profits. This mine is also one that, barring untoward events, should not look back. We own 22,670 New Modderfontein shares.

As to Modderfontein B Gold Mines, all I need say is that we have made an excellent start. The property is a very large one: an extensive area of highly profitable ground has already been proved, and the general outlook is most promising. A dividend at the end of the year is foreshadowed. The payable ore reserves at the 31st December, 1911, amounted to 2,355,700 tons, valued at 7.5 dwts. per ton. We own 97,923 Modder B shares. These four mines, I repeat, the Rose Deep, Village Deep, New Modderfontein, and Modderfontein B, have made marked progress during the last twelve or eighteen months, and at all these mines there is scope for further improvement. I now turn to the other mines, where a great deal of hard work has been done during the last year or so, but where the profits have not yet shown marked increase.

Crown Mines.

We naturally turn first to the Crown Mines, Ltd. This company held its annual meeting on the 23rd May, and the chairman delivered a most interesting and exhaustive address. The working profits, it is true, have only advanced from £1,200,470 in 1910 to £1,280,757 in 1911, but an immense amount of work has been done to enable the mine to be worked on a larger and more profitable scale in the near future. As the chairman indicated, the company is now drawing to the close of the long period of heavy capital expenditure. Towards the later part of the current year the mine will be fully equipped and in a position to crush economically, and without strain, at the rate of over 200,000 tons per month. It is anticipated that all the ore will soon be hoisted from two main shafts only, instead of from six separate shafts as at present, and the endless trouble, anxiety, loss of time, loss of tonnage, and loss of profit which the company has experienced during recent years in connection with the maintenance of the old shafts will be brought to an end. We are approaching finality of what may be termed the transition stage, and it is now only a matter of months before we shall have the actual proofs as to what can be achieved by this great mine under more favourable conditions. I may add that the management has complete confidence as to the results. The only uncertain factor in this case, as in many others, is the supply of native labour, which is variable and has not been adequate but is, I am glad to say, more plentiful to-day than it ever has been before. The ore reserves of the Crown Mines, Ltd., at the 31st December last stood at 9,696,900 tons of an average value of 7.2 dwts. exclusive of 427,171 tons, which are being left at present as safety pillars in the mine. There are also further 1.250,000 tons fully developed but not yet valued. An issue of £1,000,000 5 per cent. debentures is about to be made shortly, and these debentures will be offered to the public; shareholders of the Crown Mines, Limited, and of the Rand Mines, Limited, will be given preference in the allotments. We have no doubt whatever as to the success of the issue which we are helping to guarantee. We now hold 852,277 shares in the Crown Mines, Limited, out of the issued capital of 1,888,212 10s. shares. The affairs of this company have clearly a very important influence on the affairs of the Rand Mines, Limited.

Ferreira Deep, Limited.

I take next the Ferreira Deep, Limited, where the profit of £419,939 for the year ending September, 1911, shows an actual decrease as compared with the results of the previous financial year. This mine has been terribly handicapped during the last two years or so owing to the great pressure exercised by the overlying strata. A system of wholesale sand filling was adopted, and the extensive scale on which it was carried out will be realised when I tell you that from June, 1910, to 30th April, 1912, 605,000 tons of sand were flushed into the mine. This sand was deposited in the areas where the reef had been extracted and where the greatest pressure was felt. It was necessary to fill the underlying stopes of the Main Reef leader first, and of the above quantity, 495,000 tons have been deposited in the Main Reef leader stopes, and the remaining 200,000 tons in the stopes of the South Reef. At present 16,000 to 18,000 tons of sand are being flushed into the mine monthly, and the big programme for ensuring the safety of the mine is now almost completed. I am expressing the opinion of our technical advisers when I say that it would not have been possible to ensure the safety of the mine satisfactorily in any other way. The expense has been heavy, but the work had to be done. The main portion of the expenditure, as I have indicated, has already been met, and it will soon be possible to work under much more favourable conditions. The amalgamation of the Ferreira Deep with the Ferreira Company has recently taken place, and we believe that it will be of benefit to the shareholedrs in both companies. The present development and general condition of the Ferreira Deep mine warrants the expectation of improved profits. During the last four months the profit has been as follows: February, £32,598; March, £37,612; April, £40,612; May, £43,017. The ore reserves at the 30th September, 1911, stood at 1,837,808 tons of an average value of 9.7 dwts. The Rand Mines, Limited, own 392,383 shares in the Ferreira Deep, Limited, out of the issued capital which has been increased to 980,000 in £1 shares, since the acquisition of the assets of the Ferreira Company.

City Deep.

I deal next with the City Deep, Limited, in which we own 192,437 shares out of the issued capital of 1,250,000 £1 shares. The affairs of this company were dealt with very fully by me at the annual meeting, which was held on the 30th May. The payable ore reserves of the City Deep, Limited, amounted to 2,078,805 tons of an average value of 8.1 dwts., at the 31st December, 1911. As the matter is of general interest I repeat here the values so far exposed on each of the separate levels in this company. The following figures deal with the development up to the 31st March, 1912:

Level.	Feet sampled.	Aerage width of Reef.	Average Value.
5th	1,245	37.9 in.	15.4 dwts.
6th	5,110	30.4 in.	15.7 dwts.
7th	3,965	32 in.	15 dwts.
8th	6,990	33.7 in.	15.8 dwts.
9th	4,725	33.9 in.	11.8 dwts.

4th level, just started from a raise above the 5th level in the neighbourhood of the west shaft, averaged 90.9 dwts. over 9.6 inches for 65 feet sampled.

10th level, recently started from east shaft in a comparatively poor zone, averaged 9.6 dwts. over 37.8 inches for 135 feet driven.

In the central section of the mine, for a distance of fully one mile, the values are consistently high on all the levels, and no limit of thie enriched zone has yet been encountered in depth.

Profits have not yet reached our expectations; but, as we gradually train our underground labour force, both white and black, they are sure to rise.

It is reasonable to expect the declaration of a small dividend at the end of the current year, and shareholders should receive regular and satisfactory distributions thereafter. We think it will not be very long before the City Deep takes its proper place among the great mines of the world.

Impending Law Suit.

As regards the pending lawsuit, the company's solicitors, in a letter addressed to the City Deep, Ltd., which has been published, have stated:—

> , , , . . , Apart from the other defences entered on behalf of your compaay, on the advice of counsel, your company relies on the Bezitrecht, that is the confirmation of titles, which from time to time strictly in accordance with law were granted by the Government in respect of the aforementioned four hundred an sixty-four claims and if we remind you that your company's property is thus secured by the most complete protection which the Gold Law gives to holders of claims, we think that you can confidently look to the ultimate result of the case—a claim title covered by a Bezitrecht is unassailable unless obtained by fraud. No such plea has been put forward by the plaintiffs.

At the other mines that are controlled by us we expect improvements, but not quite so quickly as in the case of the mines that I have mentioned.

Other Companies.

At the Nourse Mines, Ltd., in which we own 387,583 shares out of the issued capital of 827.821 £1 shares, a programme is being carried out by which underground work will be improved and cheapened. The underlying scheme is to simplify the handling of all ore broken underground and to concentrate it to one main deep level shaft. The benefits of this work cannot materialise for some little time, but we confidently look forward to being able to work this mine under more favourable conditions in about eighteen months.

The ore reserves of this company stood at 2,050,705 tons of an average value of 6·6 dwts at the 31st July, 1911.

At the Geldenhuis Deep, Ltd., in which we own 282,593 shares out of the issued capital of 585,753 £1 shares, we have been having disappointing values in some of the recent development work. In March we transferred to the managership of this mine Mr. P. Selby, who has already effected various improvements since his appointment. 239,000 tons of sand were flushed into the mine to secure its shafts and workings between February, 1911, and the end of April, 1912.

The ore reserves of this company stood at 2,262,840 tons of an average value of 6·2 dwts. at the 31st December, 1911; and the affairs of the company were fully outlined at the annual general meeting held on 29th May.

In the Durban Roodepoort Deep, Ltd., we own 125,617 shares out of the total issued capital of 440,000 £1 shares. For years this company has been working under various natural difficulties, and owing to the narrowness of the south reef and the unsafe character of the hanging wall, the mine has been forced to rely chiefly on hand labour for ore breaking. It is expected that the condition of the mine will be materially improved by the end of the current year when the new powerful pumping installation will be completed, and further benefits will be felt when the bulk of the ore broken can be handled on the 12th level, which will be a main tramming level, and conveyed to the eastern shaft where all ore is to be concentrated as far as possible. The profit at this mine should become permanently steadier after the close of the current year, and should incline to increase. The ore reserves of this company stood at 1,288,071 tons of an average value of 6.8 dwts. at the 31st of December, 1911. It is hoped that it will be possible to increase gradually the percentage of main reef that can be worked; this reef is wider and, generally, poorer than the south reef. We hold 81,444 shares in the Bantjes Consolidated Mines, Limited, out of the issued capital of 502,306 £1 shares. This is a good mine, and with sufficient native labour it should be possible to earn substantial monthly profits on the basis of the present reduction operations. The principal reef of the mine is the narrow south reef, which, in most places, can be worked by hand labour only. Excellent progress has been made during the past year in the development work, and an increase in the labour force would enable the ore reserves to be increased rapidly. An interesting feature has been the promising values recently exposed on the main reef leader betwen the central and western shafts. This reef is more suitable to the employment of rock drills than the south reef, and, should it prove payable over an extensive area, mining operations would at once become much easier. The ore reserves of this company stood at 896,087 tons of an average value of 7.3 dwts., on the 31st of December, 1911.

East Rand Mines.

I will refer only to the most important company in which we have a large shareholding, but do not control. We own £33,960 of 5 per cent. debentures and 55,198 shares in the East Rand Proprietary Mines, Limited, out of the total issued capital of 2,445,897 £1 shares. I will merely repeat here what I said at the anual meeting of the East Rand Proprietary Mines, Limited, held on the 28th of February last. We are satisfied that the present management is good, and as long as development values continue as favourable as they have been, there is every reason to expect very satisfactory working results. We trust that shareholders will gradually regain their confidence in this property, for there is no doubt that the backward swing of the pendulum went a little too far. I refer next to the important interests acquired by us in the ground south of the Robinson Deep Gold Mining Co., Ltd. We now own 5,222 shares in the Booysens Estate, Limited, out of an issued capital of 35,698 £1 shares: 24,872 shares in the South Deeps, Limited, out of an issued capital of 150,000 £1 shares, and 4,230 shares in the Turffontein Estates, Limited, out of an issued capital of 50,000 £1 shares. The Central Mining and Investment Corporation, Limited, simultaneously with ourselves bought large interests in these same companies. Together with this corporation, we have, during the past year, come to an arrangement with the Consolidated Gold Fields of South Africa, Limited, by which we dispose of our interests in the Booysens and South Deeps, Limited, claims, estimated at approximately sixty in number, that are situated north of the so-called Grahamstown Dyke which passes through the Booysens ground a little to the south of the southern boundary of the Robinson Deep Gold Mining Company, Limited, and we are to receive in exchange an increased interest of an estimated equivalent value in the Southern Booysens and South Deeps Claims. By mutual arrangement the whole of the ground south of the Grahamstown Dyke will soon come under the control of the Central Mining and Investment Corporation, Limited, and of the Rand Mines, Limited. The importance of this arrangement will at once be realised. It has not yet been decided what is to be done with this Booysens-South Deeps-Turffontein ground, partly because the owners of Turffontein have so far been unable to come to a satisfactory arrangement with the Government with regard to the allocation of the mynpachts, to which it is recognised that they are entitled under the Gold Law. We trust that a settlement will soon be reached, and that the Turffontein Estates will be able to acquire a workable block on terms that are mutually satisfactory.

Native Labour.

I propose to say very little about native labour. The number of natives employed by the gold mines of the Transvaal is greater to-day than it ever has been in the past. For the month of April, which is generally about high-water mark during the year, 214,933 natives were employed For the three previous years the figures were as follows:

April, 1909	181,389
April, 1910	200,338
April, 1911	211,135

The general increase in recent years is due, in some degree, to the number of natives that have been imported from tropical territories. I am glad to be able to report that the death rate of the tropical natives, which had been abnormally high, and is known to be very high also in their own countries, has recently been reduced considerably For the first quarter of 1912, the rate has been 44.20 per thousand. The principal causes contributing to this reduction are the greater care in selection at the time of recruitment, more frequent medical examination after arrival at the mines, and more attention and care generally. The death rate during the first quarter of 1912 for all other natives on the mines was 19.41 per thousand The mortality among the Chinese on the Witwatersrand from disease only was 8.47 per thousand in 1908, and 4.6 in 1909, the year the last ones left.

Undesirable Competition.

Negotiations are at present proceeding between the mining houses with a view to putting the recruiting of labour throughout British South Africa on a co-operative basis, so as to avoid the undesirable competition that is taking place to-day and to eliminate, as far as possible, the professional contractor of labour over whose methods there can be no adequate control. It is hoped that these negotiations will lead to tangible results before the end of the current year.

The labour position generally, is, as I have indicated, more favourable to-day than it has been recently, but some of our mines have been, and still are hard pressed, for the supply has not kept pace with the ever-increasing demand. I must add, though, that it is the belief of most people who have a thorough knowledge of the subject that great economies can still be effected in the use of native labour, especially underground where it is chiefly employed. The organisation and control of native labour on the mines is not everywhere as perfect as it might be, and this is a point to which we call the special attention of our mine managers.

It is interesting to note that a steadily increasing use is being made of small machine drills. The following comparison refers to the mines in our group:

Percentage of tonnage from Stopes.

	Dec., 1910.	Dec., 1911.
By large machines ...	57%	58%
By small machines ..	3%	14%
By hammer boys ...	40%	28%

Housing Scheme.

As regards our white workers, especially our miners, too many changes take place from month to month at many of the mines. The fault lies partly with some of the mine officials, often minor officials, who are sometimes too prone to dismiss men, and partly also with the miners themselves, who keep moving from property to property in search of easy conditions and high pay. Work at these mines becomes systematically disorganised in consequence. Our wish is to check this tendency and to encourage the miners, as well as our other employes, to settle down permanently in their own homes. We have started an experiment at the City Deep, where the men who have been in the employ of the company for a certain time are being offered, at a nominal figure, freehold plots of land which that company owns. The men will be asked to make a small contribution towards the expense of the houses to be erected, and the company, which will pay the rest, will be refunded by them in monthly instalments over a period of four or five years. These instalments, which the men will have to pay will scarcely exceed the ordinary rents that they now have to pay in town or suburban districts. The underlying idea is that men will be encouraged to remain with the company, in order to obtain these exceptional facilities. Once they enter into the possession of their houses, they cannot be turned out, whether they remain in the employ of the company or not, as long as they continue to pay their regular instalments. They thus become perfectly independent and immediately enjoy all the benefits of owning their own houses. Though the company will then have no further hold on them, there will be the indirect gain of having these men in a settled, instead of an unsettled, condition and domiciled within easy reach of a number of mines, on some of which they are almost sure to work. We wish, if it can be arranged, to extend this scheme to other companies that have no township, or no suitable township areas in their possession, and are at present unable, under the existing Gold Law, to offer freehold title, though they are freehold owners of the farms. I refer, for instance, to New Modderfontein, Modderfontein B and Crown Mines. · At present large areas of good ground are closed over which the Government has, by legislation, reserved the surface rights. We want to unlock this land for the benefit of our men, and to give it to them for nothing. If we obtain the consent of the Government, it would be possible for these companies to set aside a certain amount of land not required for mining purposes, and start model villages for their workmen. The benefit to the whole community, as well as to the mines, would, we believe, be very great. I approached Mr. Malan, the Minister of Mines, quite recently on the subject, and asked him whether the Government would help up in this matter, and I am glad to be able to state that I received a most encouraging reply.

Supply of Power.

I referred last year to the contracts entered into by our mining companies with the Rand Mines Power Supply Co., Ltd., for the purchase of all their requirements of electricity and compressed air. There have been serious delays and also breakdowns at the Power Company's stations, and many of our mines have been compelled to restart some of their steam plants, which had been abandoned, but kept ready in reserve. These delays and changes greatly increased the cost of power to the mines during 1911. Substantial economies should be effected when once the full supply of air and electricity can be obtained from the Power Company, which is now erecting a large station at Vereeniging, on the Vaal River, and is about to add further air compressor plant to its existing stations at Rosherville and Robinson Central Deep. It is believed that the Vereeniging Station will be delivering electric power by September next, and the bulk of our requirements of electricity will then be met, though the stipulated spare plant will not have been erected. It will not be until the additional compressors just referred to are erected that our mines will receive their full supply of compressed air. It is estimated that this will take twelve to eighteen months. It is the opinion of our technical advisers that, notwithstanding the great expense that has had to be incurred, the discarding of our old steam plants will be entirely justified when the full supply of compressed air is obtained. Apart from the breakdowns, the electric power and compressed air delivered to us by the Power Company have been satisfactory, and better work is now being done by rock drills in the mines under the increased air pressure.

Our mines have accepted from the Power Company a sum of £35,000 as damages for failure to meet their originally specified requirements of electricity and air, and as compensation towards the cost of reconditioning their steam plants. This amount has been divided proportionately among them.

We recognise that the Rand Mines Power Supply Co. has had a heavy task owing to the magnitude of its construction programme, and we are satisfied that every effort has been made, and is being made, to complete the work rapidly and efficiently.

I wish to refer also specially to the services of Mr. J. H. Rider, our chief electrical and mechanical engineer, which have been most valuable to us at all times, and especially in the negotiations with the Power Company for a new form of contract which appeared desirable in the light of the experience so far gained.

Metallurgy.

A number of improvements have been effected in the metallurgical work of our mines during the past year, owing principally to the introduction of the Butters filter plants to which I referred in my address last year, and to more efficient tube-milling and classification. The Butters plants installed at the Crown Mines, Bantjes, Robinson, New Modderfontein, and Modder B Mines are together capable of handling 85,000 tons of slime per month. The recovery of dissolved gold is regarded as practically complete, the loss as compared with that in the old decantation process being almost negligible. The actual cost of operating the filter has been difficult to estimate exactly, but would range between 2.6d. per ton and 1d. per ton according to tonnage and local conditions. The increase of net profit due to the installation of these five plants is estimated at a very high figure. The extraction of gold for the whole group of mines under the control of the Rand Mines, Ltd., and the Central Mining and Investment Corporation, Ltd., ranged during 1911 between the minimum of 91 per cent. at the Bantjes (which has since been increased to 96 per cent.) and 97 per cent. at the New Modderfontein and Robinson G.M. Co. I must add that it is principally due to Mr. F. L. Bosqui, our chief metallurgical adviser, that the metallurgical work on our mines has been brought to the very forefront as compared with the work of gold mines in other parts of the world.

Miners' Phthisis.

I refer now to the amended Bill in regard to miners' phthisis, which is before the House after having been revised by a Select Committee. It is proposed to divide all cases into two sections; firstly, for existing cases in respect of which applications will be made during the first two years after the Bill comes into force; for these a special compensation fund is to be formed; secondly, for cases that will arise after the expiration of these two years, for which an insurance fund is to be instituted at once. It is laid down that the Government will contribute up to £100,000 towards the compensation fund, while the mines are to bear the whole of the remaining liability in respect of past accumulations of phthisis. The insurance fund, which deals with new cases, is to be formed by contributions from the mines and from the underground employes. For the first two years after the new Bill passes into law the mines are to pay a contribution equal to 5 per cent. of the wages of the underground employes every month, of which they may deduct one-half from the employes. After the first two years the contribution is raised to 7½ per cent. of the earnings of the underground employes, of which the mines may recover one-third from their men. It is a little too early to state with a reasonable degree of accuracy what the liabilities are that have thus been imposed on the Witwatersrand mines, but we assume that roughly, the compensation fund will require nearly £1,000,000 to deal with the estimated number of cases in the first two years. The burden laid on the mining industry by the compensation fund is a very heavy one. We may, assuming that the Bill will shortly become law, have to make arrangements to distribute over a period of years the cost accruing to the mining companies connected with the Rand Mines, Limited, and the Central Mining and Investment Corporation, Limited, so that the dividends of these companies may not unduly be interfered with during the next two years. Dealing with the disease of miners' phthisis, I laid special stress on the fact, when giving evidence a month ago on behalf of the Transvaal Chamber of Mines before the Select Committee at Capetown, that if there is earnest co-operation between the Government, the mines and the men, this disease may be enormously reduced, if not entirely stamped out. A great deal of knowledge and experience has been gained during recent years, and measures that we believe to be effective have already been taken on a number of the mines. Phthisis is caused by the dust from the hard sandstone rock. This must be laid immediately by the free use of water at every point where it is raised, whether in drives, raises, stopes or elsewhere. Water must be laid on at every necessary place in the mine and the man must use it. We have been making interesting experiments at the City Deep lately by mixing molasses with the water that is sprayed, and the results have so far shown that this is a decided improvement on the use of water alone. I repeat that our belief is that if a great combined effort is made on the lines that I have indicated the fatal disease of miners' phthisis can be reduced to every narrow limits, and we are of the opinion that the contributions to the insurance fund will, after a few years, assume comparatively small proportions.

Compensation Fund.

As regards the compensation fund, we are of the opinion that the mines have not been quite fairly treated. The Government have not seen their way to adhere to the plan originally outlined by them when they approached the leaders of the mining industry early last year. It was then suggested by the members of the Government that as the legislation that was intended would be partly of a retroactive nature, the Government was prepared to pay half of the compensation to be granted for the first two years, while the mines were to pay the other half. This proposal was repeated by two Ministers in the House. The then Minister of Mines, discussing the matter on the 9th March, 1911, stated :

> In regard to the present cases, the position was difficult because of this consideration that to some extent they were passing legislation of a retrospective character. He agreed that the State should recognise its liability and should be prepared to contribute towards present cases.

Then again :

> The State should also step in and recognise it also had been remiss in the matter. Ever since 1902 they had had notice of this disease existing on the mines, but they had taken no steps to combat it. It was only in the regulations which had been passed in the Mines and Works Act that they were taking real measures to combat the disease, and, as they had been remiss on their part, they should also bear a share of the burden that was to be incurred. They provided that the Government must pay one-half of the amount of compensation that was paid.

And again :

> All parties were to blame. The workmen were to blame as much as the employer was to blame. He called on the Government and got a contribution of one-half from them.

Why has the Government now gone back on all this? We fear that it is because they realise in 1912 that the liability in regard to the compensation fund will be greater than they believed it to be in 1911. The general underlying principles remain the same, but the amount of cash to be paid is greater. I must add that, in giving evidence, I strongly urged that the Government should make a determined effort to help to eradicate miners' phthisis. We advocated that the Government should institute regular medical examinations, and that men affected by tuberculosis or severely by phthisis should be compelled to abandon underground work at once and take whatever compensation might be due; the men only lightly affected by phthisis should, after a reasonable preliminary notice to be given now, also be obliged to take to other work; and we strongly recommended the adoption of a land settlement scheme for these men, to be assisted by a land bank, as recommended in the recent report of the West Australian Commission. A large percentage of underground workers are already to-day South African born, and many of them have previous experience of the land. The percentage of these men is likely to increase in the future. We regret that our recommendations have not been followed. Under the present Bill there are to be medical examinations only for new men who seek work; the men now in employment are not to be examined, and it may be feared that many of them will continue until they enter the fatal stages of the disease.

Taxation.

The inclination of some members of the Union Parliament appears, unfortunately, to be to tax unduly the gold mining industry and also the European investor. As examples of this tendency I would quote the Stamp Duties and Fees Act of 1911, the proposed Administration of Estates Act and Death Duties Act of 1912, and, above all, the recent amendment in Parliament that there should be an annual Compensation Duty of one-quarter per cent. on the market value of all bearer share warrants, as well as on the market value of all shares registered in the names of companies incorporated outside the South African Union. It is not necessary for me to discuss at length the details of the last-named proposals; they have appeared in the Press and have been cabled all over Europe. They can, I fear, be regarded only as punitive measures, which are directed against shareholders resident outside the Union. They will be most embarrassing to the small investor and must serve to restrict the inflow of capital into South Africa. Speaking on behalf of the great mass of shareholders in the Rand Mines, Ltd., I would urgently beg the Union Government to reconsider its proposals under the present Death Duties Act, and, if possible, withdraw them. A more friendly attitude on the part of the Government towards the gold mining industry would win the sympathy of investors everywhere, and help the general development of South Africa.

Bewaarplaatsen.

We trust that there will soon be finality in regard to the bewaarplaatsen question, and that the Union Parliament will confirm the resolution of the Transvaal Volksraad in 1896 that had the force of law and laid down that the freehold owners were entitled to one-half of the proceeds of the mineral rights under bewaarplaatsen claims. This resolution was reaffirmed in subsequent Gold Laws, and the Special Commission appointed to investigate the subject recommended in 1909 that the rights of freeholders should be settled on these lines.

Dividends Paid.

I have told you that during 1911 we paid £1,168,297 5s. in dividends, whereas our profits amounted to £1,117,408. The cash that we have accumulated from dividends received has been reduced to £124,547 at the end of 1911. This sum forms a portion of the total credit balance of £682,642 16s. 9d. that is now brought forward. I can inform you now that it is the intention of the board to declare a dividend of 5s. 6d. or 110 per cent. for the half-year ending 30th of this month, although, again, we have not quite earned it. We consider, however, that our action is quite justified in view of the improved results which we expect from our companies before very long

I have during the course of this address touched on the main points of the balance sheet, which is perfectly straightforward. The only item calling for explanation is, perhaps, "sundry creditors" amounting to £669,168 8s. 2d., of which the greater proportion is in respect of the dividend declared at 31st December last

If any shareholder desires to contemplate the future of the Rand Mines, Ltd., let him take a map of the Witwatersrand and examine it carefully. Apart from the possible new discoveries or new assets that may be acquired from time to time, our future lies in the working of the great mines that are of proved value and that own immense stretches of deep level ground. In the Central Rand we command the deep level ground uninterruptedly from the western boundary of the Crown Mines to the eastern boundary of the Nourse Mines, a distance of over eight miles. The lives of our mines in this central area will not necessarily be limited by their present southern boundaries. Reefs at the south boundary of the Crown Mines, Ltd., of the Village Deep, Ltd., of the City Deep, Ltd., and Nourse Mines, Ltd., will lie at so great a depth that no new company will ever be formed to work them further to the south and at a still greater depth. This we may regard as tolerably certain owing to the enormous capital expenditure and to the risks that would have to be incurred in starting new mines at vertical depths of, perhaps, 7,000 feet or more. It follows, therefore, that as long as the reefs continue payable in this central and richest portion of the Witwatersrand they will be followed down in the workings of our existing deep level mines. We know to-day of no limit that can be placed on the lives of these mines.

Mr. H. C. Boyd, the chairman of the Village Deep, at the annual meeting on the 30th May, made the interesting statement that the values in the lowest levels of the Turf Mines section were, on the whole, better than the ore values in the upper portion of the Village Deep mine; that is, the values at a vertical depth of approximately 3,500 to 4,000 feet were on the whole better than the values at a vertical depth of 2,000 to 3,000 feet. Again we have the excellent values in the City Deep at vertical depths ranging from 2,400 feet to 3,350 feet, and it is interesting to observe that the rich zone encountered in this property, as well as in the lower levels of the Wolhuter mine, immediately to the north, is in part situated below an extensive poor zone that was met in some of the upper levels of the Wolhuter mine. In the far Eastern Rand we have important holdings in the New Modderfontein and Modderfontein B. mines, which hold great claim areas. Perhaps one of the most noticeable mining features of the year 1911 has been the excellent developments in the New Modderfontein. Modderfontein B. and Brakpan Mines in this district.

No limit can yet be determined regarding the life of the Witwatersrand, and the future of the Witwatersrand is inextricably interwoven with that of the Rand Mines, Ltd.

I may perhaps be allowed to refer to the excellent start made by the Modderfontein B. Gold Mines and the Brakpan Mines last year, and to tender our congratulations to the management of the latter company. The intersection of the reef in the adjoining property, the Government Gold Mining Areas (Modderfontein), which is expected shortly in two of the shafts, will be watched with great interest.

Expansion and Improvement.

I need not dwell on the vast opportunities for expansion and improvement in the extensive mining areas to which I have referred, in which the Rand Mines, Ltd., is vitally interested. It will be realised that these opportunities do exist, and it may, I think, be assumed that we shall not fail to act when we consider that the time is ripe. I need scarcely say now that the Modderfontein B. will not always crush at the rate of only 30,000 tons a month, or the New Modderfontein at the rate of 50,000 tons monthly, or the City Deep at the rate of 60,000 tons, or the Village Deep at the rate of only 52,000 tons; but things cannot be hurried and people must be very sure of their ground in every respect before any new big programme is entered upon.

I have sketched to you in broad lines the general position and prospects of the Rand Mines, Ltd. The heavy drain of capital expenditure which has been taking place at nearly all our properties for a number of years is now drawing to a close. It is not only at the Crown Mines; at nearly all our companies the heavy work of reorganisation or re-equipping, both on surface and underground, of doing things on big and permanent lines, of electrifying our steam plants, of paving the way for cheaper and better work to come, is now nearly over. The effect of this work should soon become apparent, and shareholders will then, we are confident, approve of what we have done.

We have had a long and arduous climb, and have had to experience serious setbacks and disappointments, such as the repatriation of the Chinese, from time to time; but we are at length approaching the top of the hill. Everything points towards gradually increasing profits, and we feel that if we gain the goodwill of the Union Parliament the results that will be obtained in the future should surpass all those of the past.

Late Sir Julius Wernher.

I wish, in conclusion, to refer to the death of Sir Julius Wernher, which took place on the 21st May. Sir Julius was one of the founders of the Rand Mines, Ltd., and was a director of the company since its inception. We shall sadly miss his guiding hand. Three of the founders of this great company have now left us—Hermann Eckstein, Alfred Beit and Julius Wernher. All three were members of the same firm. All three had big ideas and high ideals. Their memory will remain with us.

I desire to place on record the board's appreciation of the services of our principal officials and our staff. I would mention in particular the names of Mr. F Raleigh, our financial manager, who has been connected with the company for over fifteen years; of Mr A. Moir, who has been the London Secretary since the inception of the company in 1893, and has, with his staff, always rendered us the greatest assistance; also of Mr. H. A. Read and Mr. S. C. Steil, our joint secretaries, and Mr. F. H. Barry, our transfer secretary. I also wish to refer to the valuable work done by Messrs. H. Stuart Martin, B. Madew, P. Cazalet and W. T Anderson, the consulting engineers to the various mining companies with which we are connected. We wish success to Mr. Anderson, who has left our service to take the management of the East Rand Proprietary Mines, Ltd. I should like to mention also Mr. E. G. Izod, who superintends the mechanical engineering work under Mr. Rider's supervision.

Mr. G. Sonn seconded the motion for the adoption of the report and accounts.

In reply to questions by Mr. F. W. Baxter, the Chairman stated that the company had, since the issue of the report sold a number of shares in the Wolhuter Gold Mines. It was very likely that the whole number of shares would be taken. A certain number were still under option to those who had taken the shares. He had not specially referred to the Main Reef West, in which the company's holding was unchanged, because that holding was comparatively small.

The report and accounts were unanimously adopted.

Messrs. H. Mosenthal and F. Eckstein, retiring directors, were reelected.

Messrs. C. L. Andersson and Co. and Mr. Thomas Douglas were reappointed auditors, and their remuneration for the past audit was fixed at six hundred guineas. The previous remuneration was four hundred guineas, and the increase was due to the extra work entailed in connection with various companies.

French Representation.

The annual meeting was preceded by a special meeting convened for the purpose of authorising the increase of the board from seven seats to eight. The change was proposed as it was considered desirable that a director representative of French shareholders should be appointed.

The resolution proposing the increase was submitted by the chairman, Mr. R. W. Schumacher, and carried, only one vote being recorded against it.

FERREIRA G.M. CO.

Amalgamation Scheme Accepted

The adjourned twenty-second annual ordinary general meeting of shareholders of the Ferreira Gold Mining Company, Limited, was held on June 4th in the board room, Corner House. Mr. H. A. Rogers presided, and there were also present Messrs. H. C. Boyd, E. J. Renaud, J. L. Jourdan, H. Eckstein, H. Daniel, A. G. Gill, and F. von Hessert, representing 5,825 shares out of an issue of 95,000.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: Our annual general meeting was adjourned from the 21st of March last until to-day for the purpose of giving shareholders ample time for the examination of the reports and accounts. Meanwhile, the scheme for the amalgamation of your company with that of the Ferreira Deep was carried, and the final confirmatory meeting will be held at eleven-thirty to-day, when your concern will be merged into that of the Ferreira Deep, and it will only remain for your directors, as liquidators, to wind up the affairs of the old company.

Influence of Costs.

At one time, I must say, I sympathised with a section of the shareholders in wishing this company to be worked to a finish, but latterly, it became more evident that working costs would mount up and profits be less than we anticipated, so the solution arrived at is a wise one for all concerned, and in view of the improved position of the Deep property, both as to earnings and improved values in late development, we may rest content with our bargain

Also, it will be advantageous to the Ferreira Deep as it will enable them to facilitate their work in many ways, and should increase their dividend-earning power, in which we shall participate. I do not propose to-day to go into any analysis of accounts before you. They have been a considerable time in the hands of shareholders, and may now be considered as past history. It remains for me to wish shareholders in the old Ferreira a great era of prosperity in their new position, and to say they have done wisely and well. I beg now formally to move that the reports and accounts for 1911 be adopted.

The report and accounts were adopted.

Messrs. H. C. Boyd and F. von Hessert were re-elected as directors.

Messrs. Ball and Stuart and W. J. Dold were reappointed auditors.

Special Meeting.

A special meeting was held at 11.30 a.m., when the resolutions for amalgamation, passed on the 17th of May last, were confirmed and the necessary resolutions to give effect to this decision passed.

BENONI CONSOLIDATED.

Meeting Adjourned.

The thirteenth ordinary general meeting of shareholders in the Benoni Consolidated Gold Mining Company was convened for this week in the Anglo-French board room, National Bank Buildings.

Mr. W. Dalrymple presided, and there were present Messrs. Geo. R. Airth, F. Elkan, E. H. Read, C. R. Pinder, C. A. Wentzel (solicitor), and the secretarial staff.

The Chairman's Speech.

The chairman said: Since the date of this meeting was fixed, I regret to say that, owing to the failure of the cyanide plant, your board have been compelled to suspend operations until arrangements could be made to remodel that portion of the reduction works. In the meantime a proposal for amalgamation with the Apex Company has been laid before the board, and on the 25th of April last the following notice was issued in the public Press: It has been found impossible to work profitably with the existing cyanide plant which will require to be remodelled, and as under those conditions it is inadvisable to deplete the ore reserves, the board have decided to temporarily suspend operations. The board have under consideration certain proposals for the amalgamation of your company with the Apex Mines, Ltd., Gold Section, and the provision of adequate working capital. Under these proposals, it is suggested to bring the reduction plant capacity up to 40,000 tons per month, on which basis the combined company should be able to mill in about a year's time.

The boards of both companies have secured the services of Mr. C. D. Leslie, consulting engineer to the Consolidated Gold Fields of South Africa, Limited, who will make an independent report and valuation, which will be submitted to shareholders. The report will state, inter alia, whether the proposed amalgamation is a sound mining proposition, and whether the terms proposed are fair and equitable to both companies."

Mr. Leslie's report has now been received, and is under consideration by both boards. As, however, the negotiations have not reached such a stage as will permit of a definite statement being made to shareholders, your board have considered it in your best interest that this meeting should be adjourned for a period of a month, say to the 20th June next. It is hoped by that date the negotiations at present being conducted will have reached finality one way or the other. Though this is the ordinary annual general meeting, your board are desirous of supplying you with all information possible with regard to these negotiations in addition to the information contained in the reports and balance sheet concerning the general affairs of the company. You will understand, however, that at this stage it is impossible for the board to impart any information while the negotiations are still proceeding, and it is with a view to enabling the board to afford you this information as soon as possible that the adjournment of this meeting is suggested. Should the negotiations result in an arrangement being arrived at, you will, of course, be called together in extraordinary general meeting to consider such arrangement and approve of it or otherwise. The matter is, however, in your hands, and in order to bring it to an issue, I now formally move "That this meeting be adjourned to the 20th day of June next at the same hour and place."

The motion was unanimously adopted.

FRENCH RAND.

Mine at a Standstill.

The fifteenth annual general meeting of shareholders of the French Rand Gold Mining Company, Ltd., was held this week in the board-room, Corner House. Mr. H. Eckstein presided, and there were also present Messrs. E. M. Hind, Comte F. de Ferricres, E. Renaud, J. Jourden, H. P. Rogars and J. W. Buckland, representing 98,096 shares out of an issue of 514,000.

The Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: I have little to add to the reports and accounts before you. The expenditure incurred during the year has exceeded the revenue by £4,356 9s. 4d. Maintenance, caretaking and licences account for £4,655 out of a total expenditure of £7,820. Directors' fees, though appearing as a debit in the profit and loss account, merely represent a book entry, as they have not actually been paid, and all other expenses have been reduced to a minimum. A cash deficit of £22,071 is shown as at the 31st of December last. I regret to say that mining operations still remain suspended, and as there is little change in the conditions which obtained at the time it was decided to shut down, the directors cannot at the present moment suggest any scheme for restarting the mine. I now beg to move the adoption of the report and accounts for the year ended the 31st of December, 1911.

The report and accounts were adopted.

Messrs. H. P. Rogers and H. O'K Webber, retiring directors, were reelected.

The auditors, Messrs. C. Stuart and A. E. A. Williamson, were reappointed.

MODDERFONTEIN B.

Dividends in Sight.

Development Policy.

The third annual ordinary general meeting of shareholders of the Modderfontein B. Gold Mines, Ltd., was held on June 4th in the board-room, Corner House, Mr. R. W. Schumacher presiding. There were also present Messrs. H. Eckstein, A. Mackie Niven, H. Neumann, E. A. Meintjes, G. Sonn, A. G. Gill, S. M. Nelson, F. Boerckel, S. Evans, and E. A. Wallers, representing 282,540 shares out of an issue of 700,000.

The Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: I have pleasure in submitting to you the reports and accounts for the year ended the 31st of December, 1911. It will be seen that the results on the whole have been most satisfactory. A trial crushing of the reduction plant, which consists of eighty stamps, five tube mills, and cyanide equipment, was started last September, and since the 31st of October the full plant has been running steadily and without a hitch. During the trial crushing 16,335 tons were milled, and for the rest of the year 1911, a further 61,625 tons; the working profits from the 77,960 tons amounted to £64,379.

Underground Preparation.

The develpment work done during 1911, totalling 13,346 feet, shows a considerable reduction as compared with the figures of the previous year, due to the fact that all available labour was concentrated during the latter months of the year on getting the mine into good order for stoping operations. The underground mechanical haulages had to be completed, as well as the work in connection with the main ore bins and approaches to the shaft bottom; stope faces had also a be opened out as rapidly as possible, and we had, unfortunately, not sufficient labour to carry on development work at the same time. Of the total footage only a little more than half, that is 6.809 feet, was in reef formation, and disclosed an average value of 26.9 dwts. over a reef width of 11 inches. A considerable portion of the footage was composed of supplementary work, such as haulage levels, pump chambers, etc.; new stope faces were also opened up by an additional winze connection in one of the largest and best ore blocks, but no new ground was exposed.

Ore Reserves.

The payable ore reserves at the 31st December, 1911, amounted to 2,355,700 tons valued at 7.5 dwts. per ton. These figures show a decrease of 432,300 tons as compared with the ore reserve of the previous year, but an increase in value of .5 dwt. As explained in the report of the consulting engineer, the decrease in the payable ore reserves, and the increase in their value is due to the fact that we have eliminated certain blocks of ore found to be unpayable with the knowledge we now possess as the result of actual stoping operations. The average stoping width is now taken at 51 inches, as compared with 48 inches at the end of 1910.

You may remember that the policy of development adopted for this mine forms a marked departure from that which had been followed on these fields. The ore blocks are larger in size, averaging 1,000 feet by 800 feet, and the long stope faces are served by tracks and stope haulages concentrating on to a main haulage level which feeds the ore shaft that hoists all the ore. The arrangements for bringing the ore to the shaft and for rapid hoisting to the surface are certainly second to none on these fields. The method of laying out the mine has saved us much capital expenditure, and all credit must be given to Mr. H. Stuart Martin, our consulting engineer.

Smooth Working.

The mine is working at ease, and can feed the present reduction plant without difficulty. The ground is comparatively easy to break, and the grade of the ore mined continues consistently good. The hanging wall of the stopes has needed constant attention owing to the flat dip, but it is being safely held up by means of systematic packing of waste rock, sorted underground from the ore mined. Since the start of milling operations to the 31st of May, 1912, 234,060 tons were crushed, and the total working profit amounted to £208,351.

Though stoping operations have been carried on at nearly all the available payable working faces, the grade obtained has been above what is considered to be the normal value of the mine. It will be clar hat it is not possible to determine or control closely the grade when working such large blocks of ore as we are now doing, and it is almost certain that there will be fluctuations from time to time. Our business, in the circumstances, is not to endeavour to work too closely to any specified grade as long as the ore we mine is distinctly payable.

A Warning.

I must add, in answer to inquiries, that I have received from shareholders, that our engineers consider the monthly profit is not likely to fall very considerably owing to the large reserves of rich ore. At the same time recent profits must be regarded as abnormally high on the basis of the tons milled. The profit for May is estimated at £29,036 from 32,600 tons crushed. The balance sheet shows that there was a cash deficit of £117,842 on the 31st December last. On the 30th April, 1912, after allowing for expenditure on capital account, and for Government tax on profits, etc., this deficit was reduced by current working profits to £24,128, and it may be roughly taken that we have now liquidated the debt, and shall henceforward, from the 1st of June, be accumulating funds for dividend purposes. I mentioned at the meeting held on the 22nd of March, which was adjourned, that the dividend position would be about even by the end of June, but it was then not contemplated that our gold reserve fund, which was published from month to month, and amounted to £24,451 at the 29th of February, 1912, would be abolished. There is no further capital expenditure in view, apart from the cost of some houses that we shall have to build for our employes.

Bright Prospects.

As regards the general prospects of the mine, I can say that these are very bright. There is evidently an extensive area in our very large property that contains ore of excellent grade. There is every reason to assume that the first dividend of the company will be declared at the end of the current year, and that regular and substantial distributions will follow thereafter.

I must add that we are still somewhat short of labour, and have not sufficient to carry on all the development work that we should like to do. When conditions are more favourable, we intend to open up the eastern portion of our large property, which to-day is comparatively unexplored, and also to push down our workings rapidly in the rich zone on the western side. We shall then be able to make a more accurate forecast of the possibilities of this important mine, and will shape our policy accordingly. Mr. Ralph Martin, who had charge of the property and did excellent work, was obliged to resign the management owing to a severe illness, and Mr. E. H. Clifford was appointed manager at the beginning of this year in his stead. Mr. B. Madew is now consulting engineer, while Mr. H. Stuart Martin is taking a well-deserved holiday.

The report and accounts were adopted.

The appointment of Mr. C. Meintjes as a director in the place of Mr. G. Brunton, resigned, was confirmed.

The retiring directors, Messrs. M. G. Elkan and R. W. Schumacher, were re-elected.

Messrs. C. L Andersson and Co. and H. J. Macrae, auditors. were reappointed.

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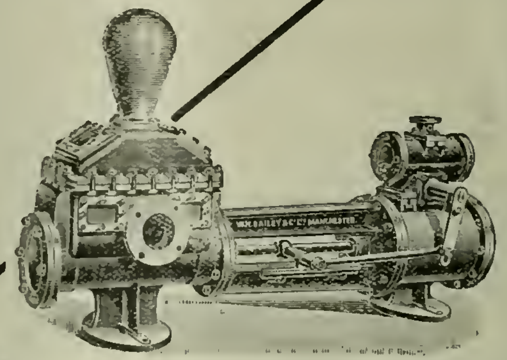

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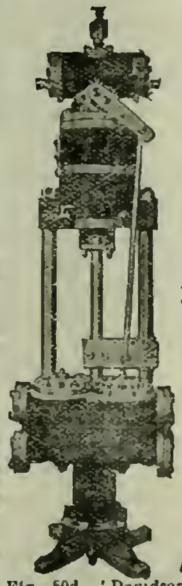

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Notes and News.

Luipaardsvlei Estate. We understand that the management of the Luipaardsvlei Estate and G.M. Co., Ltd., which has for some years past been under the ægis of the Consolidated Gold Fields, will be taken over by the Ehrlich control during the current month. As the Gold Fields have no interest in the company, having merely directed the technical supervision and management, and as Messrs. Ehrlich & Co. are the largest local shareholders, this arrangement was mutually agreed upon.

* * * *

A New Type of Machine at the Knights Deep. A new type of machine drill is in operation in the Knights Deep, of which we hope to give a description at an early date. The machine is of Flottmann pattern, and has been adapted to a bar. There are several features in connection with this drill which are of special interest. Ten machines of this type are now running in the Knights Deep, and are doing excellent work. Of the Konomax, by the way, more is soon likely to be heard.

* * * *

Metallurgy "pour rire." That otherwise most interesting and well-informed author, Mr. Hamilton Fyfe, in his recently-issued book on South Africa, is unconciously entertaining in a way that has given joy to the metallurgical sobersides of the Rand. Of course Mr. Fyfe devotes a chapter to Rand mining, but apparently has forgotten to verify his facts. We find him, for instance, stating that Rand ore goes to tube mills in order to fit it to be dealt with by the stamps, and in place of zinc he says our metallurgists employ tin shavings. Mr. Fyfe's politics are, however, sounder than his metallurgy, and we almost forgive him for his lapses in the latter for the vigour with which he gives General Hertzog a piece of his mind.

* * * *

Miners' Phthisis Bill. The Miners' Phthisis Bill has now passed its third reading and been sent to the Senate. Important alterations have been made in the Bill, few of them in the nature of improvements. Until the final draft of the Bill, as amended, reaches us, it would be idle to offer comment, but in our next issue we hope to analyse the Bill as it now stands and appraise its significance.

* * * *

The Robinson Central Compressor Station. Attention has been drawn to a somewhat obvious misprint in our article of the 7th June describing the air compressor station of the Victoria Falls and Transvaal Power Company, Ltd., at the Robinson Central. In the figures relating to the output it is stated that the air output is 200,000 tons per month. Since the volume is 3,200,000,000 cubic feet, of which 16 cubic feet weigh one lb., the weight is clearly 100,000 tons of 2,000 lbs. per month.

* * * *

Leeuwpoort Plant. It has practically been decided that the reduction plant for the Leeuwpoort Mine shall consists of 12 Nissen stamps, to deal with 150 tons per day. The order has not yet been placed, but Nissen stamps are strongly favoured by the manager and consulting engineer.

* * * *

Developments at the Wolhuter. The Wolhuter working faces appear to be looking well at present, and whilst there are no very sensational developments to be recorded, it is pleasing to find that the old mine is "showing up" well in most sections. During the past quarter development values in the deep level section have shown an improvement over those of the preceding three months. Over 1,000 feet of drives, etc., were sampled in this portion of the mine, disclosing an average assay value of 5·3 dwts. over the very substantial width of 4 ft. 3 in. In the east incline section good values are being maintained, 723 feet having been sampled averaging 7·7 dwts. on a width of just under 4 feet. The total payable tonnage developed during three months was 86,279 tons, as against 85,550 tons milled. The ore reserves at date amount to 777,666 tons, valued at 6·4 dwts. over 4 ft. 3½ in.

* * * *

The Granatplaats Diamond Syndicate.

A new diamond venture is being floated to prospect the farm Granatplaats, in the Boshof district, situated between the Roberts Victor and Blaauwbosch mines, and close to the Eland property. This farm has for a long time been regarded as a likely diamond producer, and it has now been taken up by a powerfully-backed local syndicate with a capital of £5,000. The directors include Mr. W. J. Gau (of Messrs. Farrar Bros.) and a representative of Messrs. E. Friedlander & Co. A number of leading mining men and firms are understood to have subscribed to the venture. Mr. H. S. Harger is consulting engineer of the Syndicate, and prospecting operations are proceeding under his direction. True kimberlite is stated to have been discovered, and four diamonds recovered to date, one of which is reported to be of very excellent value. There are about 16 feet of lime tufa overburden covering the kimberlite, and this no doubt has been a considerable drawback to prospecting in the past. It now, however, appears that the farm is to have a thorough trial, and it must be admitted that prospects are very encouraging

* * * *

Tanganyika Rumours.

Various rumours, all more or less of a sensational nature, are in circulation regarding the Tanganyika Concessions, Ltd. One report is to the effect that the company are closing down their offices in Katanga, it being understood that the Union Miniere will in future transact all the business of the Tanganyika Concessions Company, in order to save dual administration expenses. According to another report, the Star mine is to be transferred to a powerful syndicate of English, American and Belgian financiers. It is difficult to assess the amount of veracity in these statements, but there appears to be a good deal of truth in the first-named rumour.

* * * *

Dynamite in Agriculture.

Messrs. Reunert & Lenz, agents for the De Beers Explosives Company, are giving a demonstration at Nancefield on Monday, the 17th inst., and at Potchefstroom Experimental Farm on the 20th inst. A full account of the demonstration will appear in our next issue, making special reference to the boring tools and implements employed. It is noteworthy that special explosives will be made to suit all classes of soils and for all purposes such as tree planting, subsoiling, stump removal, reconditioning impoverished lands, etc. The British South African Explosives Company is also giving demonstrations of the use of dynamite in agricultural work and tree planting at Nelspruit on the 14th inst., Irene on the 15th, and Pretoria on the 19th. Further demonstrations will be given at Ermelo, Witbank, Middelburg and the Western Transvaal at subsequent dates, to be fixed as soon as the local arrangements have been completed. In view of the widespread interest created by the demonstration which took place at Orange Grove on Saturday last, it is expected that the future fixtures will be largely attended.

* * * *

Shamva Plant Ordered.

We understand that the Shamva people have placed an order with Messrs. Head, Wrightson and Co., Ltd., for 56 Nissen stamps of a crushing capacity of, approximately, 25 tons each per day. It is expected to crush from 40,000 to 45,000 tons of ore per month. Parsons' turbines have been ordered to supply the motive power. The railway will reach the mine by next November, and the crushing plant is due for delivery early in the year. The order for tube-mills has not yet been placed. The native compound at the property is to be enlarged to accommodate 1,000 natives. There appears to be no difficulty in obtaining plenty of labour in the district. The mine, on present developments, promises to become one of the biggest mines in the world. Recent development figures, *i.e.*, three months ending June, will of course be influenced by the breakdown to the air compressor, and the total tonnage of ore in reserve at the end of the half-year will, therefore, not be as great as was anticipated. The making of one million bricks for the mine is being pushed on rapidly. The first lot of timber is now on the way, and in a few weeks there will be bustle and activity all round. The railway track is within easy distance of the mine, and the Kimberley Reefs —Poti River section— is now virtually completed. The following figures reflect the position at the mine:—

	Tons.	Average Assay Value unreduced dwts. per ton.	Reduced dwts. value per ton.
During quarter ended March 31, 1912	283,740	13·48	7·78
Tonnage at March 31 ...	2,091,859	8·08	4·97

An interesting fact is that a borehole is being put in to prove the reef at the bottom of the Lone Star Hill.

* * * *

Mining in the Kilo District.

Statements recently circulated to the effect that the Kilo district of the Congo Free State, which is known to contain payable gold reefs, is about to be thrown open to prospectors, have induced several people in South Africa to consider trying their luck in this far-away region. Attention may therefore be directed to a timely notice issued by the Government Department of Mines. The statement in question contains the following warning: "Notice is hereby given that, notwithstanding any statement which may have been put in circulation regarding the throwing open of the Kilo district, in the Congo territory, for mining purposes from the 1st July next, the Department of Mines is authorised to state that it is not the intention of the Government of Belgium to open the said district for mining." Whether it is or is not proclaimed, we shall strongly advise all those who have any thoughts of proceeding to the Kilo territory to consider the matter very carefully before making any definite plans for departure.

* * * *

Zambesia Exploring Co.

The accounts of the Zambesia Exploring Company for the fifteen months ended September 30th last show a profit of £26,452, chiefly made up of sums received by way of interest on monies advanced to companies whose welfare it is to the interest of the Zambesia Exploring Company to promote. The directors are thereby confirmed in the opinion that their policy in this direction has been the right one to pursue. The policy of assisting the Tanganyika Concessions in its enterprises has been continued. This has been rendered necessary by the large initial expenditure consequent on the delays which invariably occur in launching a big industry in a new country. Since the meeting in December last, at which full particulars were given as to the position of smelting operations in Katanga to that date, smelting has been carried on with European coke, Wankies coke and coal and local charcoal, and with varying charges of ore and flux, with the object of arriving at the most economic results. The sample of coke, which was made at Wankies as a test, was highly satisfactory both in analyses and appearance. Zambesia Exploring holds a large interest in the Benguella Railway Company, which is making satisfactory progress, the receipts showing a steady increase from year to year. The policy carried out by the board in increasing its interest in that railway appears to be justified. In the circular sent to the shareholders last year the directors stated that an agreement had been entered into between the Special Katanga Committee and Tanganyika Concessions for the joint exploitation and development of the diamond pipes. Prospecting on a small scale on one or two of the diamondiferous pipes has been undertaken during the year, but no important discovery has yet been made.

Life of the Village Main Reef.

At the annual meeting of the Village Main Reef Company, held in London on Wednesday, Mr. Braunstein, the chairman, made an interesting reference to the life of the mine. He said that the ore reserves represented a two and a half years' supply for the mills, and that the undeveloped areas would extend over a further two and a half years, after which they could mine large quantities of lower grade ores. It is to be presumed from these remarks that the "Village" will continue to crush ore of an average grade corresponding to that used at present for another five years, and that afterwards the mine will continue to produce gold for some time to come from ore of a lesser value per ton. For how long this will last is problematical, but it is clear that the Village Main Reef will continue to produce gold and earn profits for a considerable time to come. It is interesting to compare the present indication as to life with previous estimates. The 1905 official calculation, based on the use of a certain amount of Main Reef, was that at December 31st of that year there were about 3,750,000 tons of Village Main Reef ore and the amount of ore in the Wemmer section at October 31st, 1905, was computed as 324,775 tons. The official estimate of life at December 31st, 1910, was four and three-quarter years, with any residue of low-grade ore ignored. The Village Main Reef, like the majority of other Rand propositions, is clearly going to exist as a producer for a substantially longer period than generally has been anticipated.

* * * *

Land Company's Policy.

Speaking at the annual meeting of the Southern Land Company, which has considerable land interests in the Transvaal, Mr. Henry Samuel said, in mail week: "There is one line of policy on which I would like to lay great stress in the matter of the future conduct of this concern. It is the necessity of forming working arrangements or amalgamations between the various English land companies operating in South Africa. In my own opinion, and I speak with some authority on the subject, owing to a lifetime's experience of local conditions, shareholders in Anglo-South African land companies cannot expect to reap the fullest measure of success that their patience deserves until working expenses have been cut down by these means to a minimum, and the resulting combination of economy and influence exerted to their maximum. The question of working arrangements or amalgamations as regards ourselves, however, belongs to the future and cannot affect the object of the present reconstruction. Returning to the immediate cause of the present meeting, namely, the reconstruction of the company, I believe we have caught that elusive period, the "psychological moment," for bringing it about. Now that the South African Land Settlement Bill has become law and the sum of £5,000,000 has been allocated for the purpose of purchasing land and fostering settlement within the Union, the board is strongly of the opinion that the time has arrived to expect a steady and permanent increase in land values. In order not to leave this entirely to chance, it is necessary that we ourselves make a start in the direction of settling our own estates on practical, economical and up-to-date lines. In carrying out this part of our programme, it is the desire of the board so as to order their methods that we shall certainly deserve and possibly obtain the financial support, through its Land Bank, of the Union Government. It is the intention of the board to proceed without delay with the work of cutting up our lands, as far as practicable, into medium-sized holdings and town sites, and to settle white men upon them. In this work we trust to obtain at least the benevolent support of the Union Government; but if we fail to gain the official assistance that, in our opinion, such a project deserves, we are nevertheless determined to go on with the development of our lands."

TOPICS OF THE WEEK.

MR. MERRIMAN'S ATTACK ON THE MINES DEPARTMENT.

The event of the week in Parliament has been the attack by Mr. J. X. Merriman on the Rand industry and more particularly on the Government Department whose special care it is. For Mr. Merriman's wide knowledge of public finance, and for his ability as a financial critic, we have the greatest respect and regard. On the bewaarplaatsen question, for instance, his attitude is commendably statesmanlike. But his display of rhetorical fireworks directed against the working and supervision of the mines leaves us unimpressed. When, moved by a sincere desire to make known the actual working conditions of the industry to the Union legislators, the Rand and Pretoria last year issued a special invitation to the members of both Houses to visit the fields, Mr. Merriman was one of the first to refuse. He had views on the social and industrial life of the Rand which, apparently, he did not wish to have disturbed. Among the vines and fruit trees of Schoondezicht, he preferred to contemplate from afar the iniquity of the "university of crime," which for him constitutes the Rand. So the invitation went unaccepted, and one of the results is that Mr. Merriman can stand up in the House to-day and condemn every phase of the industrial life of this place with the consummate ease and fluency characteristic of the critic who is untrammelled by any too intimate acquaintance with the problems and difficulties of the industry. Like the London critics of the Rand, who from the safe eminence of the editorial armchair in Fleet Street condemn mining and administrative methods in periods whose flowing virulence is only checked by a conscientious regard for the niceties of a faultless prose style grafted on to an upbringing of American journalese, Mr. Merriman scourges the unfortunate Mines Department with whips and scorpions. To him, distance lends disenchantment. It is something new for a supporter of the Government to attack the Mines Department. He complains that the last report of the department is eighteen months old. But if he and his fellows will keep the Government Mining Engineer chained to the purlieus of the House in Capetown for three months at the busiest time of the year, surely his strictures are somewhat unfair? It might seem that in putting the blame on the Mines Department for the phthisis and accident evils of the Rand, Mr. Merriman is absolving the industry itself from any share of the responsibility. Our own columns only last week contained a similar attack directed mainly against the qualifications of mine inspectors, and it would be only too easy to complete the discomfiture of the department by supporting Mr. Merriman's bitter reproaches. But it is as ridiculous to blame the department alone for either the extent of the phthisis evil or the high accident rate as it is to blame the mine managers alone. Phthisis, of its very nature is an insidious evil. For years it grew almost imperceptibly, and the realization of its full magnitude came as a thunderbolt equally to the mines and to the department. And since that discovery it has been the business of both equally to stamp out the evil, as far as their present knowledge and ability permit. In regard to accidents, Mr. Merriman forgets that his premises have been proved wrong over and over again, notably by the Chairman of the Crown Mines in a letter to the press last year. The accident rate on the Rand is higher than the average of other mining fields simply because the Rand keeps ultra-careful statistics, while other industries and fields either keep none at all or else content themselves with approximations always in their favour. The Panama works alone approach the Rand in the scientific accuracy of their statistical methods in this particular. Mr. Merriman's strictures on mine inspectors are nearer the mark. Mr. Malan, we note, does not attempt to answer them, though the fault notoriously lies with the limited amount of the vote under this head allotted by the Government. So attenuated is the amount set apart for paying inspectors, that young, inexperienced assistant inspectors have to be appointed, as none others would accept the salaries offered. In giving evidence regarding the new mine regulations, it will be remembered that the Chamber of Mines made strong representations to the Government on this subject, urging that unless mine inspectors were better paid inferior men only would be available to fill the onerous duties of mine inspectors. Mr. Merriman's chief complaint is that Parliament gives itself a vast amount of trouble passing mine regulations, and the whole object and aim of these measures is defeated by faulty and inadequate inspection. The short and sufficient answer to that plaint is that Parliament could employ its time to much greater advantage than in passing endless rules over-regulating and embarrassing the industry almost out of existence. The Rand is the most over-regulated mining centre in the world. If all the new regulations passed in the last twelve months are to be enforced to the strict letter a small army of inspectors, far more highly paid than at present, will have to be employed. Greatly increased expense to the Government, and a slow death to mine managers by red tape strangulation is the obvious corollary. To our mind the only sensible way is to trust the mines to do everything possible, if only on the lowest ground of economy and efficiency, to improve the working conditions, and to trust less, not more, to the mere sergeant-major-like methods of the mine inspector. For the rest, the department concerned is well able to defend itself, and we shall look forward with interest to the address to be delivered by the Government Mining Engineer to-night, in his capacity as President of the South African Institution of Engineers, for a reply to Mr. Merriman.

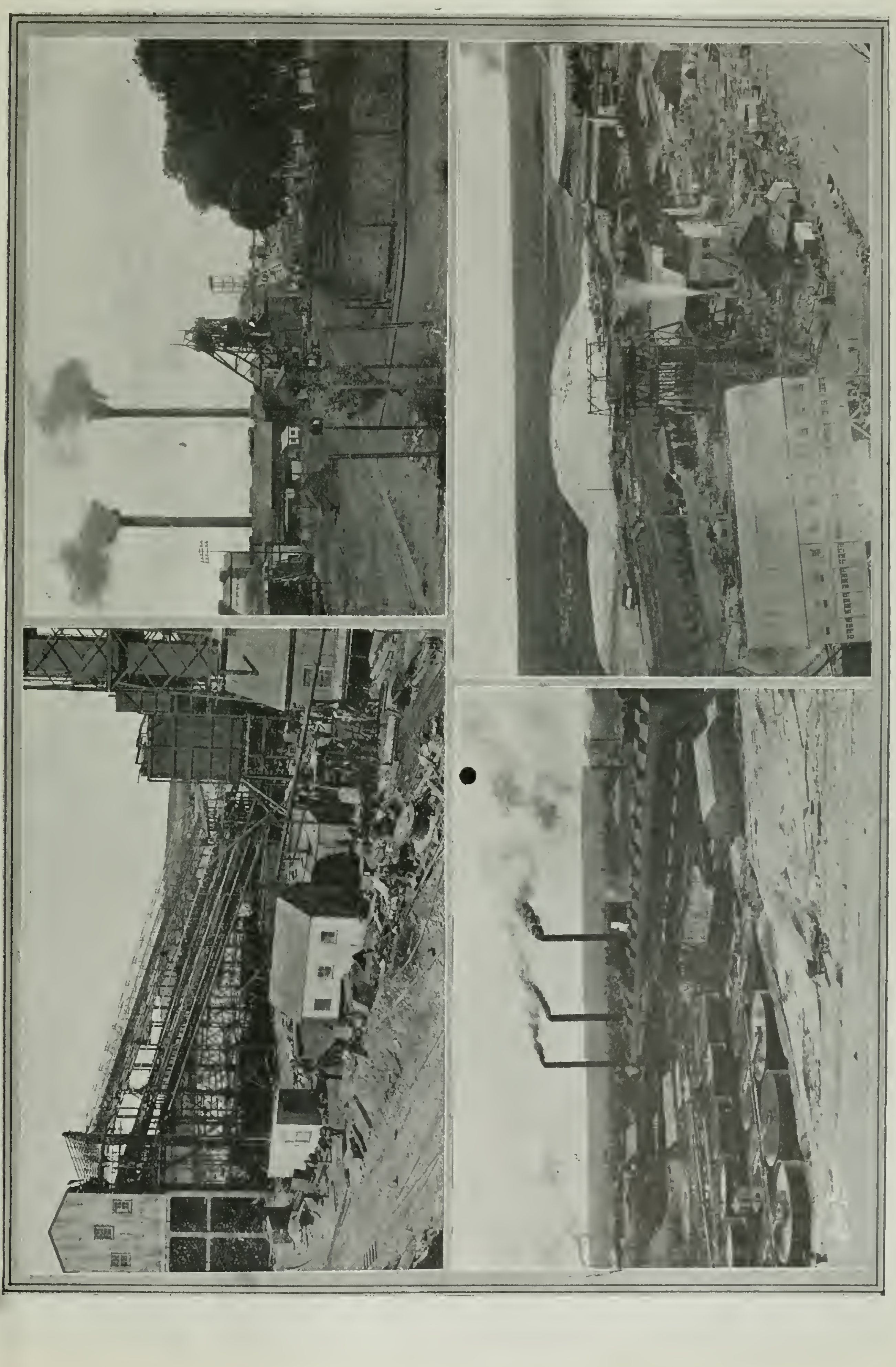
SIR GEORGE ALBU ON THE OUTLOOK

Sir George Albu's reputation for sane, constructive optimism is worthily maintained by his speech at the annual meeting of the General Mining and Finance Corporation last week. The speech itself is printed in another part of this issue, and will be found to deal fully with the finances of the company, the position of the subsidiaries, and with outstanding questions affecting the industry in general. Sir George admits that the year has been disappointing, the market unresponsive, and capital shy. Labour, moreover, has not ceased to give trouble, and Sir George is plainly tired of the abortive attempts to unite the groups "to eliminate the insensate competition" in that field. Nor does Sir George allow his political proclivities to blind him to the part played by the unsympathetic attitude of the Government in causing the present discontent. Nevertheless, he is not downhearted. He feels that all will come right in time. In concluding his review of the accounts, he said:—"The net result of the year's operations is that we are only able to carry forward a balance of £20,147 to the new year's account, as compared with £269,482 brought forward from 1910 (after providing for the dividend declared for that year). This is a decidedly unsatisfactory state of affairs to have to record, but I trust that we have now reached bedrock as regards both market conditions and labour troubles on the mines, and that we shall consequently be able to show an improvement in the position of your corporation at the end of the current year." Referring to the present share market conditions, Sir George made what is generally regarded as the most significant of his remarks. He said: "I must state my conviction that the existing pessimism and apathy in regard to Rand mining companies has reached a point altogether unwarranted by the actual position of affairs on these fields, and that the present quotations for the shares of reputable and promising propositions—not only of profit-making mines, but also of properties in the developing stage—are standing at prices which in most cases represent a considerably lower level than the intrinsic value of the concerns in question. As an instance of this, I may say that there is quite a number of companies the shares of which to-day are quoted at a figure which does not represent even the actual expenditure on the equipment and development of their properties, and therefore does not allow a single penny for the value of the reef claims held." We confess that Sir George Albu's confidence appeals to us. Optimism is essential to progress. "In this country," said Sir Percy Fitzpatrick on a famous occasion, "the optimist is always right." But time moves slowly to his justification. If the Rand is to go forward, Sir George Albu's attitude must be adopted in preference to that of the professional "bear," the incompetent ex-employee, or the disgruntled Labour critic. The Cassandra-like croakings of these last are mere counsels of despair. Mr. Schumacher anticipated Sir George, and, it will be remembered, declared that the industry has reached the hill top, after years of arduous climbing. The metaphor is a happy one, only it is necessary to emphasise the fact that the hill-top, in true South African fashion, is not a pinnacle, but a plateau, and that the descent is still far distant.

STRIKING THE REEF IN THE FAR EAST

It is something of a co-incidence that within a very few hours of each other the shaft on the claims of the Rand Klip, Ltd., and a shaft on those of the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd., should have struck the reef series, for which they have been exploring, at depths of approximately 1,800 and 2,400 feet respectively. At the Rand Klip the official announcement is to the effect that "the Main Reef has been passed through, and the footwall shale intersected at a depth of 1,804 feet." At Modderfontein, according to recent cables to London, in the "north-west shaft, Main Reef, 27 inches wide, has been struck at 2,395 feet; looks well," the value being 7·15 dwts. over 31 inches. In our last issue we stated that it was confidently anticipated that the reef would be encountered in the Rand Klip property within the next three or four weeks, the depth of the shaft last Sunday week being 1,793 feet. The shaft was then passing through quartzite containing interbedded pebble leaders, some of which gave traces of gold. As anticipated, the reef series was struck at a lesser depth than those at which it was intersected in the two boreholes which were put down a little more to the dip, and to this circumstance is doubtless due the fact that the sinkers supposed themselves to be within a two or three weeks' further search of the reef series when they were actually cutting through it. At the Government Mining Areas meeting, on the 29th May last, Mr. Imroth announced that the depth of the north-west shaft was 2,300 feet, and that it appeared probable that another 200 or 300 feet would have to be sunk before the Main Reef was encountered. The intersection of the reef at a depth of 2,395 feet is a tribute to the careful estimates of the technical advisers of the company, particularly in view of the fact that there was no borehole evidence available on the property or in its immediate vicinity. The point of chief importance is, of course, that of values, and the results of development will naturally be awaited with no small amount of anxiety by all concerned, and with more or less of genuine interest by all who are desirous of the expansion and prosperity of the mining industry to its uttermost limits. The assay results obtained in the shaft itself are distinctly satisfactory and encouraging.

The Rand Klip shaft is the furthest point at which payable Witwatersrand reefs have been struck along a practically continuous line east of Johannesburg. It is distant approximately 25 miles, as the crow flies, from the centre of the city, and is located at the hinge of the bend in the formation where the series of reefs worked from Benoni to Modderfontein turns abruptly round to the south-east and heads for the Nigel country. The north-west shaft of the Government Mining Areas lies to the south-west of the Rand Klip shaft, nearly four miles nearer Johannesburg. Should satisfactory results be obtained in the development from these two shafts, public confidence in an area which has been described as a second Rand will be immensely strengthened. The bearing of development returns on the popular estimation of the Government Mining Areas, in particular, is obvious, for here exploitation has been set on foot in what is practically an unknown country, and vast sums of money depend upon what fortune has in store when the reefs come to be opened up. There is no evidence available, as yet, that can be relied upon with anything like security, except that provided by the faces in the north-west shaft, and, in the same degree, that they tend to confirm earlier and more or less theoretical estimates will they be received with satisfaction by a very large number of shareholders.



Views of Crown Mines Surface Plants.

CITY DEEP ELECTRIC MAN HOIST.

Features of Particular Interest—The Eddy Current Brake.

A NEW electrically-driven man hoist has recently been put to work at No. 2 shaft, City Deep, Limited, which has some novel features. We are able to reproduce an illustration of this hoist, and the following description sets forth its particular points. The hoist is of the double drum type, the drums being 11 ft. diameter by 4 ft. wide. One of these drums is keyed directly to the shaft, and the other is a loose drum with a multiple jaw clutch which is operated by compressed air power. Outside the drums, and mounted on the same shaft, is a 3-phase induction motor of 1,600 b.h.p., normal rating, on the one side, and an Eddy current brake on the other. There are only two main bearings, and the shaft is in one piece throughout its length. The hoist is capable of hauling a nett unbalanced load of five tons at a speed of 3,500 feet per minute from a depth of about 3,250 feet. The speed of the motor is 100 r.p.m. The winding rope is 1½ inches in diameter, and a tail rope is used, so that only the net weight of the load has to be handled. The motor is of the ordinary 3-phase induction type, wound for 2,000 volts and 50 periods in the stator, and the control is done through a 3-phase water resistance in the rotor circuit. Each of the drums is fitted with post brakes which are operated by compressed air, obtained either from the pipe line of the Rand Mines Power Supply Company, Limited, or from auxiliary electrically-driven compressors in the engine room.

The Eddy current brake consists of a revolving direct current field magnet system, similar to the revolving field of an alternator, with a hollow cast iron stator presenting a smooth face to the air gap. The stator framing is cast hollow, and water circulation is used to keep down the temperature. The braking is effected by the eddy currents which are generated in the cast iron stator as the field magnet system revolves, and the braking effect is controlled entirely by varying the strength of the field magnetising current. The range is such that the hoist can be lowered, on the Eddy current brake alone, at any speed from full speed down to crawling speed for shaft inspection. The current for exciting the field magnet system of the Eddy current brake is obtained from a generator driven by a 3-phase motor and connected in parallel with a small storage battery of 400 ampere hour capacity. In the event of any failure of the motor generator, while the brake is in use, the storage battery comes into play, and in the event of the failure of this, the air-controlled post brakes are ample for stopping the hoist in a short distance. Experiments which have been made under ordinary working conditions show that the Eddy current brake gives most easy control of the speed of the hoist, and that the energy used for the field circuit is very small compared to that which would be required if reverse current were applied to the winding motor in the usual way. There is a similar hoist at the Turf shaft of Village Deep, Limited, and these two winders form the first examples of Eddy current brake control on the Rand. Their operation will be watched with great interest. The electrical portion of these hoists was manufactured by the British Westinghouse Electric and Manufacturing Company, Limited, and the mechanical portion by Messrs. Graf and Nagel, Limited, and were supplied through Messrs. Rintoul and Davis, of Johannesburg.

DIVIDEND ANNOUNCEMENTS.

The Bantjes Enters the List—Improved Distribution by the Village Deep.

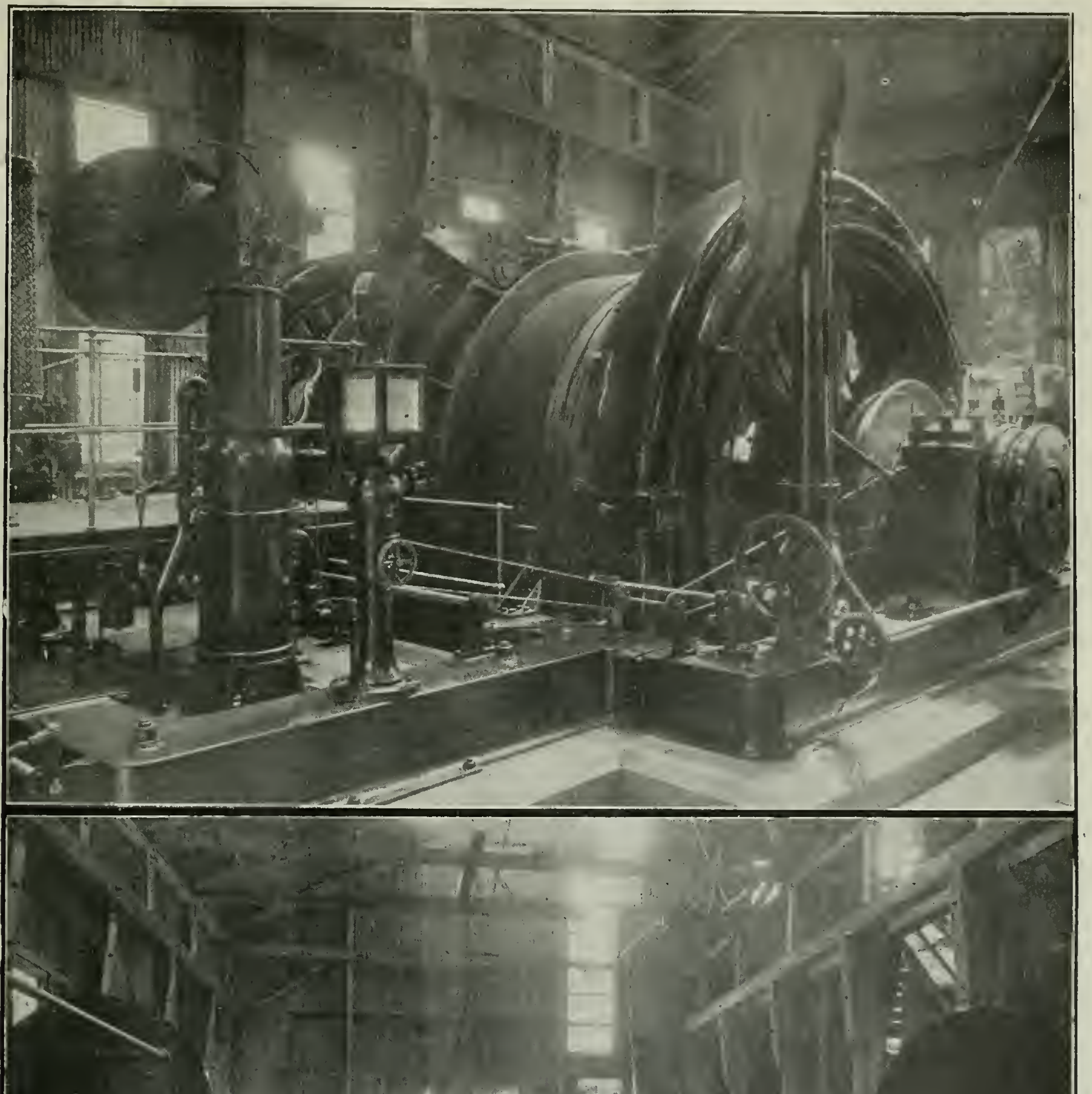
DIVIDEND notices for the first half of the current year are beginning to roll in, and it is gratifying to note that already a new name figures in the list of distributors in the Bantjes Consolidated. Mr. E. A. Wallers forecasted this at the annual meeting held the other day, and it must be specially pleasing to shareholders in this long-established concern to at last observe the Bantjes in the list of Rand dividend distributors. The rate is 5 per cent., or one shilling per share, and the amount involved on a capital of £502,306 is £25,125. This dividend will be payable to all shareholders registered in the books of the Company at the close of business on June 29th. The New Modderfontein's dividend is at the rate of 12½ per cent., or ten shillings per £4 share, and absorbs £175,000. The rate of distribution for the first half of last year was 11¼ per cent. and for the six months ended December last 12½ per cent., or the same amount as the present declaration. The Robinson's fortieth dividend is at the same rate (12½ per cent.) as the distribution for the final half of last year, but is 2½ per cent. below the rate distributed for the first six months of 1911. The Robinson to date has distributed nearly nine and three-quarter millions sterling amongst shareholders. The Village Deep Company pays out 7½ per cent., or £79,550, as compared with 5 per cent. in each of the 1911 half-years. The increased rate reflects the much better returns obtained.

Appended is a list of dividends paid out by Rand gold mining companies for the first half of the current year:—

Company.	Capital.	Rate per Cent.	Rate per Share.	Amoun
Bantjes Consolidated ...	£502,306	5	1/0	£25,125
Cons. Main Reef	924,364	5	1/0	46,218
Durban Roodepoort ...	125,000	10	2/0	12,500
East Rand Proprietary...	2,445,897	12½	2/6	305,737
Ferreira Deep	910,000	20	4/0	182,000
Main Reef West	491,188	7½	1/6	36,838
Meyer and Charlton ...	200,000	25	5/0	50,000
New Modderfontein ...	1,400,000	12½	10/0	175,000
Nourse Mines	827,821	10	2/0	82,782
Robinson	2,750,000	12½	12/6	343,750
Treasury	540,000	12½	10/0	67,500
Van Ryn	500,000	22½	4/6	112,500
Village Deep	1,060,671	7½	1/6	79,550
Village Main Reef... ...	472,000	35	7/0	165,200
Wit. Deep	550,000	12½	2/6	68,750
Wolhuter	860,000	8¾	7/0	75,250

New Vaal River Diamonds.

During the month of May 138 diggers on the New Vaal River Company's Estate registered 2,025¾ carats of diamonds, which realised £11,594 5s. Included in this output was a magnificent stone of 141¼ carats, which was sold for £1,555; one 9¾ carats at £12 10s. per carat, one 15¼ carats at £11 7s. per carat, one 63¼ carats at £11 1s. 6d. per carat, one 26 carats at £11 1s. per carat, one 17½ carats at £11 per carat, one 18¼ carats at £10 5s. per carat, one 22¾ carats at £10 2s. per carat, one 68 carats at £10 per carat, one 13 carats at £10 per carat, one 26½ carats, one 25¼ carats, one 23¾ carats, one 23¼ carats, one 17¾ carats, one 15¼ carats, one 14½ carats, one 14¼ carats, one 13½ carats, one 12¾ carats, one 12 carats, one 10¾ carats, one 10½ carats, and one 10 carat stone.



City Deep Electric Man Hoist.

THE WEST RAND UNIFIED.

Milling to commence West of Randfontein—Operations on a New Line of Country—Reefs claimed to be Main Reef Series.

The activity which has prevailed for some time past on the slope of the long ridge which lies about three-quarters of a mile west of the Ferguson-Van Hulsteyn-Johnston blocks of the Randfontein Central G.M. Co. has not failed to attract a considerable amount of attention, not only in the immediate neighbourhood, but elsewhere. It is even reported that Sir J. B. Robinson himself has been sufficiently interested to ask his staff a great many pertinent questions about the undertaking that has ventured to rise up on the flanks of Randfontein and dispute its claim to be the only payable series worth talking about beyond the Krugersdorp bend. Interest has somewhat increased, latterly, in view of the fact that a twenty-stamp battery has been erected, and that milling will begin, in all probability, within the next forty-eight hours. A series of reefs has been opened up over a distance of several hundred yards which is considered by the directors of the West Rand Unified to be the extension of the Main Reef Series in these parts, and since the company possesses close upon two miles of this series in two blocks nearly adjacent to each other, the result of milling operations will be watched very intently both by those who place full faith in the theory and by those who oppose it utterly.

The Geological Problem.

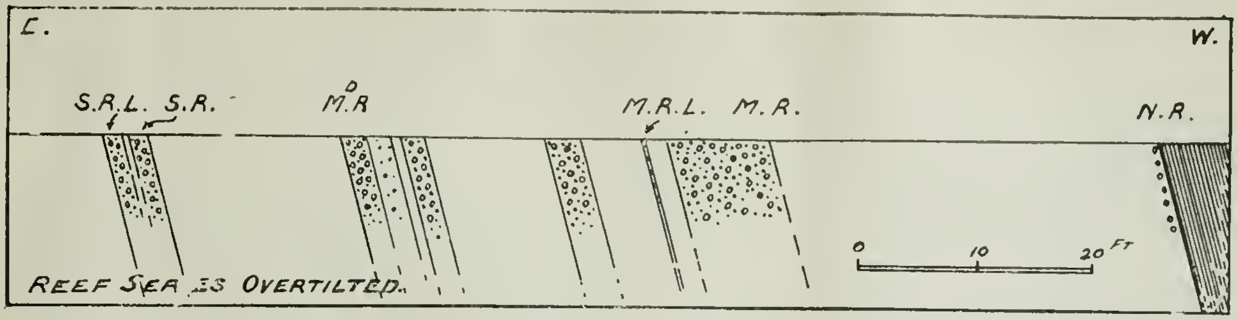
We have had occasion more than once, in the past, to point out that all the geological problems of the Rand are far from being settled. The last time we said so was not long before Dr. Mellor read his first paper upon the geology of the Lower Witwatersrand, and incidentally gave abundant confirmation of our views. Investigations carried out still more recently by the Geological Survey have made it plain that there is no geological theory in existence with regard to the structural arrangement of the Witwatersrand formation that may not be susceptible of modification, in some cases to a considerable degree, when its evidences have been subjected to the chain and plane-table method of cross-examination adopted by Dr. Mellor. There is the very comprehensive theory of Mr. David Draper, for instance, that the Main Reef and its extensions are the only payable gold carriers in the Witwatersrand formation, and that the series was located pretty well as far as it is ever likely to be within a very short period after the Witwatersrand was discovered. This theory is of such a sweeping and general kind, when one considers how little is definitely and certainly known of the limits and trend of the Main Reef Series, that it would be surprising to find it proof against the methods of the Geological Survey above referred to when the mapping is extended beyond its present limits. On the East Rand there is the mapping of Dr. Hatch to be corroborated, or the reverse, and on the West Rand that of Dr. Carrick. Both are sufficiently definite as regards their main conclusions, although far from complete in the matter of detailed evidence, and both are being disputed by people who are spending a good deal of money in support of their geological convictions. Mr. Bleloch is dealing with Dr. Hatch's conclusions, while the West Rand Unified are busy in the attempt to subvert those of Dr. Carrick. Each has at least the justification that the course of the Main Reef Series on the East and West is still an open question, but the West Rand Unified claim to have definite evidence in this connection which leaves little room for doubt as to the accuracy of their view.

In order to gain a clear understanding of the nature of this evidence, it is necessary to examine the well-known map prepared by Dr. Carrick to accompany his report upon the property of the Western Rand Estates, Ltd. On the northern portion of Waterval No. 74, a little to the north-west of the "werf" in that neighbourhood, is shown a short section of the Government Reef series running about N.E. and S.W. It is commonly agreed, we believe, that this is unquestionably a Government reef section. The importance of the series as a marker in the Lower Witwatersrand formation is generally recognised. Dr. Mellor has drawn attention to it in his last paper upon the "Normal Section of the Lower Witwatersrand," where he says:—"In the Government Reef series the most characteristic and most easily followed horizons are those of the Government Reef itself and the Coronation or West Rand shale. . . . The most characteristic feature of this horizon is not so much any peculiarity in the reef itself, as the manner in which it almost invariably lies directly on the shale below, and even when the pebble bed is absent the same sharp junction of the shale with the quartzite is seen." Dr. Carrick, also, considers that "the Government Reef series is just about as characteristic a series as could possibly be wished for by any student of the geology of the West Rand." He has, very naturally, therefore, taken care to mark upon his map any outcrop of the series which he believed to exist on the Western Rand. The series of reefs now under exploitation by the West Rand Unified are so marked, but beyond the fact that a pebble layer is occasionally found at the shale contact, there appears little resemblance between the section and those taken at the other recognised Government Reef localities. The connection between this point and that to the north of the farm Waterval, already referred to, is indicated upon the map by dotted lines to indicate that it has not actually been traced, as, indeed, it could not well be on account of the heavy overburden of soil and Black Reef formation. The course, as indicated, is an assumed one, that is to say, and the pebble leader at the shale contact is relied upon to prove the relationship. Kaasner, in his large map of the district, refers to the West Rand Unified reefs as Botha's series.

The Botha's Reef Section.

Mr. Franklin White, who knew the latter series very well, said, in a contribution to the Geological Society of South Africa some years ago:—"The Botha's Reef series is formed of three pebble beds, sometimes close together, sometimes three feet apart. The thickness varies from a few inches to six feet. It carries gold in payable quantities. The pebbles in the lower bed are large, being generally one to three inches in length. I have seen some much larger. The rich South Leader, generally two to five inches in thickness, is distinguished by the flatness of its pebbles. Two small pebble barren reefs lie, one immediately below, one above, the South Leader." A section given in the same paper showed that the Botha's reef section of these pebble beds lay about 85 feet above the red shales at the contact, and that the three conglomerate beds, of which the centre constituted the South Leader, were at a distance of 105 feet from the shale contact. The following section, taken in a trench on the West Rand Unified ground, does not fit in altogether with Mr. Franklin White's section, and it is claimed by Mr. Kunst, who is largely responsible for the taking up of the properties, that it is really that of an extension of the Main Reef series, which he considers to be quite independent of the Botha group, his view being that the latter is a portion of the more southern beds which has been thrust northwards over the Main Reef horizon. The whole forms an extremely interesting geological problem, and the operations of the West Rand Unified will be watched in consequence, as we have said, with very close attention.

The reefs which are at present being opened up are those indicated as South Reef and South Reef Leader, the two forming a considerable body, and Mr. Kunst estimates that a return of something like 5 dwts. will be obtained from the reefs and parting combined. It is inadvisable to sort until harder rock is reached in depth, because the gold, as commonly occurs in outcrop rock, has been leached to some extent, by secondary influences, into what will be more or less barren waste when the unoxidised zone is reached. It is interesting to note that some unusually-high values



Actual Section of Reefs at the West Rand Unified, with the Designations Given by the Company.

S.R.L. = South Reef Leader; Md.R. = Middle Reef; M.R.L. = Main Reef Leader; M.R. = Main Reef; N.R. = North Reef.

have been found in a cross-cut from the Penwith shaft by Mr. J. M. Calderwood. The result of his inspection proved the existence of one reef, over a width of 26 inches, giving 13 ozs. 4 dwts.; another of 36 inches giving 5 ozs. 4 dwts. and a leader giving 13 ozs. 7 dwts. over seven inches. This shaft has not been unwatered, for pumping plant has not yet been installed on the mine, the ore being taken from the outcrop at present. Several shafts and winzes are in progress, however, and there should be no difficulty in keeping the mill going provided values remain fairly consistent The starting of milling operations on a line of reef entirely outside the old-established sections is a circumstance which deserves special reference, and for this reason we have gone into some detail with regard to the undertaking. Since the operations carried out by the Count de Waru on the Promise reefs, north of the Roodepoort-Witpoortje line of railway, there have been no efforts to deal with anything outside the recognised lines on a practical working scale. Working expenses at the West Rand Unified should be moderate, in view of the width and number of reefs available within a convenient distance and their high inclination. The dip at the outcrop is towards the west in the northern section of the property. Towards the south it trends back again, and finally takes a normal inclination of about 75 degrees to the west. The dip is, therefore, very near the vertical throughout.

ECONOMICS FROM THE CHAIR.—II.

New Men and New Methods—Improvements in Metallurgy—The Life of Rand Mining.

The fact that mining conditions generally are changing, of necessity, as a result of the new and varied problems met with in the deeper levels of the Rand, is commonly admitted by the critics of the gold mining industry. What these critics fail to recognise, for some unexplained reason or another, is that it is not possible to alter mining methods and schemes on the necessary scale without a temporary dislocation of profit-making, which lasts for a longer or shorter period in proportion to the magnitude of the operations involved in the change. Not only must methods be altered, but men with experience and ideas adapted to the new order of things must be employed to carry it out. It is not unlikely that in the re-shaping of affairs a great many resignations and dismissals have taken place, but there appears no reason to assume that the new men are not as competent as their predecessors, or that a body of men capable of dealing adequately with newer conditions is not at the moment in office on the Rand. The critics are evidently in a hurry to criticise, and because engineers who have learnt the economics of mining in collieries have been appointed to supervise mines where the business principles of coal mining and methods are particularly applicable, they make the entirely gratuitous assumption that the introduction of coal mining notions has been overdone. That point has still to be demonstrated. In an editorial note on the subject in *The Mining Magazine*, for instance, we find the following remarks:—"Somebody had the brilliant idea that a coal mining expert was adapted to the exploitation of ore deposits that had the uniformity of a coal seam. The geology and the policy were alike fallacious. That epoch came to an end, in its turn." It has not yet come to an end, as a matter of fact; but, on the contrary, is in course of making. A somewhat conflicting view of the position appears in another part of the same magazine, where the special Johannesburg correspondent writes as follows:—"The conditions underground in the mines of the Rand, at the present time, resemble in many ways those of large collieries. It has been, by a natural sequence of events, as the continuity of the gold-bearing conglomerates was ascertained, and their similarity in many respects to coal seams proved, that methods of mining which have been found successful in large collieries should gradually be introduced here. . . . Mechanical ventilation has become essential to cool the underground workings and to improve health conditions. Mechanical haulage underground is slowly coming into vogue, and circular shafts are being sunk. All these are innovations on the Rand, but are the general rule in large collieries. With the gradual incoming of these schemes there will be, eventually, a change in the *personnel* of the technical staffs of the mines. Many men, already having colliery experience, have been brought out from England to take up positions as consulting engineers and managers of mines for the various groups. The new systems coming into use underground on the Rand are steps in the right direction, but care must be taken that colliery methods of working are not pushed too far, as they require modification in many ways in order to suit local conditions." From all this it may be gathered that "the man on the spot" neither instigates nor corroborates the statement that in "the brilliant idea" with regard to the employment of a coal mining expert and the use of coal mining methods, "the geology and the policy were alike fallacious."

These changes in mining methods which we have been discussing were dwelt upon at some length by Mr. Raymond W. Schumacher in his speech from the chair at the last annual meeting of the Rand Mines, and in reply to the query as to what had been accomplished so far in the process of reconditioning, he said:—"We have only had time to achieve partial success. We have, though, already improved, and we think permanently improved, the working conditions of some of our important mines, and these improvements are indicative of further progress that is to follow. At other mines we have not been able to make as rapid an advance; conditions everywhere are not equally favourable, and in some cases more time is required to achieve success than in others; but everywhere the signs are not wanting that we are working on right lines." The results of operations at various mines where circumstances were becoming approximately normal were quoted, as, for example, those of the Rose Deep, Village Deep, New Modderfontein, and Modder B., all of which have made marked progress during the past twelve or eighteen months, and at all of which there is scope for further improvement.

Metallurgical Improvements.

Among the matters of economic importance referred to by Mr. Schumacher at the Rand Mines meeting were the success of the Butters filter installations on the Rand, and the advances made in tube-milling and classification. The recovery of gold in the slimes works is limited, practically, only by the quantity of gold dissolved in the solution, the loss, as compared with that in the old type decantation plants, being almost negligible. The actual cost of operation has been difficult to estimate, but ranges between 2·6d. and 4d. per ton, according to tonnage and local conditions. The extraction of gold for the group of mines under the control of the Rand Mines, Ltd., and the Central Mining and Investment Corporation, Ltd., ranged during 1911 between a minimum of 91 per cent. at the Bantjes (which has since been increased to 96 per cent.), and 97 per cent. at the New Modderfontein and Robinson. A tribute was paid to the efforts of Mr. F. L. Bosqui, chief metallurgical adviser to the group, to whom it was due that the metallurgical work on the mines concerned " has been brought to the very forefront as compared with the work of gold mines in other parts of the world." The figure of 3d. per ton of slime treated was, we believe, suggested some time ago as a likely average figure for the working cost of the Butters filter plant by Mr. Bosqui. An uncertain item of the cost at present appears to be that of the wear and tear of the filter leaves. No reference was made to the results attained by the use of the zinc dust process, which has been said to be capable of improvement. The questions of tube-milling and classification were merely referred to by Mr. Schumacher, but the progress of the former is sufficiently attested by the extent to which tube-mills are being installed in the most modern plants. At the Consolidated Langlaagte, as will have been seen from our description of the plant last week, the ratio of tube-mills to stamps is as high as 10 to 1. Classification is a matter which receives a considerable amount of attention at the present day on the Rand, the high recovery possible in properly conditioned slime plants, and the large proportion of slime created in tube-mills, making the precise separation of these products into the most advantageous grades a point of no small importance. The ratio of 40 to 60 for sand and slime, as proposed at the Consolidated Langlaagte, will be about the highest attained, so far, on the Rand, if memory serves us well.

The Duration of Rand Mining.

In discussing the future of the Rand Mines, Ltd., and its dependence upon the continuation of payable ore in the deeper levels, Mr. Schumacher was at the same time discussing the future of the whole Rand, inasmuch as it is, as he very truly remarked, " inextricably interwoven with that of the Rand Mines, Ltd." The properties held by this great corporation are typical, as regards geological conditions, of those that go to make up the whole line of reef from the extreme west to the furthest east, and if there is the promise of a long life for the former, there is equally good reason to be assured of prolonged vigour for all. It is desirable, therefore, that the attention of those who continue to harp on the unsupported and unsatisfactory evidence of Mr. Hellman should be drawn to the fact that Mr. Schumacher states definitely of the Rand Mines properties that " We know to-day of no limit that can be placed on the lives of these mines. Mr. H. C. Boyd, the chairman of the Village Deep, at the annual meeting on the 30th May, made the interesting statement that the values in the lowest levels of the Turf Mines section were, on the whole, better than the ore values in the upper portion of the Village Deep mine; that is, the values at a vertical depth of approximately 3,500 to 4,000 feet were, on the whole, better than the values at a vertical depth of 2,000 to 3,000 feet. Again, we have the excellent values in the City Deep at vertical depths ranging from 2,400 feet to 3,350 feet, and it is interesting to observe that the rich zone encountered in this property, as well as in the lower levels of the Wolhuter mine, immediately to the north, is in part situated below an extensive poor zone that was met in some of the upper levels of the Wolhuter mine." At the City Deep meeting, a few days previously, the excellent values obtained in development over a continuous distance of about a mile, were a source of gratifying comment, and, as Mr. Schumacher said, " This mile of ground constitutes probably one of the finest mines in existence."

Brakpan Mines.

During May the Brakpan Mines made a working profit of £40,317, or 15s. per ton on 53,650 tons crushed.

Zaaiplaats Tin Mining Co.

The following is a copy of a report from the mine manager, dated 10th June, 1912:—" Development at No. 6, Roodepoort section, has now located a large payable ore body. We have at least ten feet by twenty feet already exposed. (Subsequent telephone message states ten feet by twenty-five feet exposed by last two blasts), with pipe matter still in roof and sides. It is similar in appearance to No. 13. The lower section over five feet is good grade with big patches on the footwall as high as thirty per cent. tin. I consider on further development that this will prove to be a producer second to none on these fields. The ore body is now being developed by a winze which is being sunk from above, and two drives on the footwall, and has every appearance of being very large when fully exposed. By survey it is one hundred and sixty-two feet from the boundary (subsequent telephone message states that a re-survey makes the distance 150 feet) of Zaaiplaats and making straight for it. It is dipping at about ten degrees. We are starting night shift immediately."

Voorspoed Diamonds.

Diamonds to the value of £8,154 6s. 2d. (8,546 carats) were registered by the Magistrate of Kroonstad during the month of May.

Australian Diamonds.

It is stated (says the London *Mining Journal*) that a cablegram has been received in Sydney from the South African representative of one of the leading firms of diamond cutters in Amsterdam, authorising the representative of the D nnamia Mine to ship all diamonds won from alluvial and matrix sources in the Inverell district through the Bank of New South Wales, and to draw at three days' sight for amount of his valuation of diamonds shipped. It is now almost certain that the control of the new matrix mine will be kept in Australian hands, and that a diamond cutting and polishing industry will be started in New South Wales by the end of this year. The diamonds from Copeton already cut and polished in Europe have convinced connoisseurs of their unsurpassed brilliancy, so much so that two American and one English orders for Copeton diamonds for necklaces have been already received.

ORE RESERVE GRADES AND RECOVERIES.

A Complete Analysis—Mining and Milling Widths—The Influence of Sorting.

Many aspects of that most vital factor in mining—development—present themselves for consideration at this time of the year, when company chairmen are unburdening themselves and placing before shareholders a full statement as to the condition and achievements of the various mines of the Witwatersrand. These speeches, together with the reports of consulting engineers and managers, enable one to assess the values of the different properties as closely as the vagaries and inconsistencies of mining permit, and no one can accuse Johannesburg of secrecy in the matter of detailing ore reserves, values, and tonnages. Neither can the controlling houses be taxed with not keeping adequate reserves ahead of the mills, save in a very few instances. In this respect, and in regard to the publication of development particulars, the Rand is probably ahead of any other mining field in the world. To take the mines under Corner House control, it may be mentioned, as affording testimony to the stability of the undertakings concerned, that the Modder B. reserves are nearly six years ahead of present milling requirements, the Crown Mines and the New Modderfontein five years ahead, the Rose Deep over four years, the City Deep, Ferreira Deep, and New Heriot over three years, the Durban Deep three years, the Bantjes, Village Deep, and Nourse Mines two and three-quarter years, the City and Suburban, Village Main Reef, and Geldenhuis Deep two years, and the Robinson about a year and three-quarters.

Values and Recoveries.

These and other informative facts have been well brought out in recent reports and speeches, but there are other aspects of the ore reserve question which are of the very greatest interest and concern to shareholders, and which the most lengthy of reports does not deal with in any very concise or informative manner. Not the least important of these little ventilated aspects is the relation of recovery to assay value of the ore in reserve. It is a long exploded fallacy that because the grade of the ore reserves in a mine is, say, 10 dwts. per ton, the actual recovery per ton should be 10 dwts. also. It has been proved and demonstrated on the Rand ever since its inception that in practice, although the mill plates and extractor boxes may recover 80, 85, 90, or even 95 per cent. (as modern plants are now doing) of the gold determined by assay in the screen samples, the relationship actual recovery bears to assay value of the blocks in the mine is always below—generally a good deal below—the extraction percentages given above. Errors in sampling and unsortable fines are largely responsible for this. Different mines have to be considered on their own particular cases in this regard; in fact, it might be said that stopes have to be considered on their own particular characteristics and peculiarities. As a general rule, it may be said that, with the best metallurgical appliances extant, a recovery of not more than from 80 to 90 per cent. of the assay value in the mine can be expected; in other words, if the average assay value of the stope blocks on a milling width is 10 dwts. per ton, an actual extraction of not more than 8·5 dwts. is in general practice obtained.

An Interesting Table.

It will here be of interest to state the values of the ore reserves as contained in the last annual reports of Rand companies, and to contrast these with the actual recoveries obtained and recorded in the Chamber of Mines analysis sheet issued for the month of April.

	Recovery per Ton.	Average Value of Payable Ore Reserves.	Waste Sorted out.
	dwts. per ton.	dwts. per ton.	per cent.
Aurora West	5·46	5·85	14·37
Bantjes Cons.	7·11	7·3	11·32
Benoni Cons.	4·97	6·56	12·82
Brakpan Mines	7·18	6·73	15·32
Cinderella Cons.	7·20	6·73	14·36
City Deep	8·21	8·1	15·98
City and Suburban	9·05	7·6	12·25
Cons. Langlaagte	5·78	6·7	3·42
Cons. Main Reef	6·44	6·7	11·32
Crown Mines	7·79	7·25	12·69
Durban Roodepoort Deep...	7·30	6·8	17·79
East Rand Prop. Mines ...	7·74	6·9	10·49
Ferreira	6·56	8·13	7·71
Ferreira Deep	11·43	9·7	19·11
Geduld Prop.	6·19	8·18	19·86
Geldenhuis Deep	7·27	6·2	19·61
Ginsberg	7·15	6·8	32·14
Glencairn	3·61	3·5	14·78
Jupiter	4·79	5·74	8·9
Knight Central	5·88	6·04	8·46
Knights Deep	4·13	5·2	7·42
Lancaster West	5·37	6·65	16·87
Luipaardsvlei Estate ...	4·26	5·2	17·81
Main Reef West	8·05	7·0	11·75
May Consolidated	6·31	6·84	17·39
Meyer and Charlton ...	11·55	10·09	2·37
Modderfontein B.	9·25	7·5	10·11
New Goch	4·91	5·06	22·68
New Heriot	8·54	8·4	14·83
New Kleinfontein	6·63	7·49	24·01
New Modderfontein	9·37	7·6	12·03
New Primrose	6·31	6·7	10·43
New Rietfontein	6·21	6·1	20·10
New Unified	7·44	6·7	18·49
Nourse Mines	7·61	6·6	13·49
Princess Estate	5·77	7·26	20·89
Randfontein Central ...	5·57	7·24	6·34
Robinson	10·33	11·4	15·21
Robinson Deep	7·61	7·2	12·74
Roodepoort U.M.R.	5·12	5·49	22·49
Rose Deep	6·85	6·0	14·38
Simmer and Jack	5·16	6·1	5·47
Simmer and Jack East ...	4·36	5·4	4·15
Simmer Deep	4·18	4·9	7·23
Van Ryn	6·12	6·37	6·72
Village Deep	6·78	6·1	14·10
Village Main	8·57	9·2	16·5
West Rand Cons.	6·22	5·25	12·31
Witwatersrand	5·54	5·65	22·25
Witwatersrand Deep ...	6·69	6·79	10·34
Wolhuter	6·49	6·45	11·18

Milling and Mining Widths.

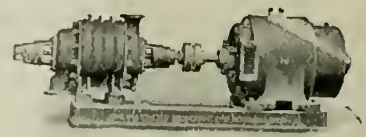
These figures would be of much greater value were all ore reserves recorded in milling width values, that is to say, were the assay values per ton of ore reserves published in terms of grade entering the mill, instead of actual stope face values. Naturally, sorting reduces the mining width or stoping width of ore broken, and correspondingly increases the recoverable assay. It may be recalled that the East Rand Proprietary Mines formerly adopted this milling width basis, but since the reorganisation of the concern, have followed the general practice of declaring the value on a stoping width. By means of sorting the value per ton is increased, and whereas it would appear from the above table that half the properties of the Witwatersrand were milling ore of a value in excess of the average grade of the ore reserves, it is, in reality, true that only a few properties are working ore above average assay. No doubt justification can be advanced in each case where this is being done. Selective mining is easily warranted under certain circumstances. Thus, in the case of a short monthly run owing to a breakdown, working expenses naturally rise, and as costs are above normal the management will generally be justified in mining stopes of above normal value. Most of the mines of the Rand have now abolished ore reserves, and have adopted the wholly commendable practice of declaring current production and current profits only. Fluctuations are to be expected, but one or two significant and official notes and statements have recently been published as to the wisdom of mining ore of average grade only, and it appears that in the future certain propositions which have hitherto milled ore somewhat above normal grade will work rock of slightly lower value per ton.

New Heriot.

The returns from the New Heriot for last month's operations are as follows:—Ore milled, 12,830 tons; gold recovered, 5,553 fine ozs.; profit, £9,101.

Geduld Proprietary.

It is officially announced that 93,684 shares in the new issue of 125,000 shares of the Geduld Proprietary Company have been accepted by shareholders, leaving a balance of 31,316 shares to be taken up by the guarantors.



Write for List 495.

TURBINE PUMPS

Pulsometer Engineering Co. Ltd

11, Tothill Street, LONDON.

9 Elms Iron Works, READING.

AGENTS FOR THE TRANSVAAL:
HARVEY & CO., LTD., Johannesburg.

MINERS' PHTHISIS BILL: SELECT COMMITTEE'S REPORT.

Government's Contribution.

The Select Committee appointed by the House of Assembly to inquire into and report upon the Miners' Phthisis Bill issued its report last week. The committee consisted of Messrs. Merriman, Chaplin, Geldenhuys, Oliver, Creswell, Wilcocks, Runciman, and the Minister of Mines. The Committee's report states:—Your Committee have considered the Bill, together with the petitions praying that the Bill may be so amended as to secure to the sufferers from miners' phthisis compensation in conformity with the principles of workmen's compensation, and the recommendation of the Governor-General referred to them on the 30th April and 21st instant respectively, and now beg to report the Bill with certain amendments which they recommend to the consideration of the House. Your Committee beg further to recommend to the House the advisability of urging upon the Government that more effective inspection of every mine be carried out by the inspectors of the Mines Department, and a special report of such inspection be submitted to the Minister dealing with the prevention of miners' phthisis underground, and that for this purpose additional assistant inspectors of mines be appointed.

THE £100,000 CONTRIBUTION.

There is a minority report by Messrs. Chaplin, Runciman, and Oliver as follows:—With reference to the decision of the majority of the Committee as to the amount to be contributed by the Government towards the fund for compensating present cases, we desire to state that, in our opinion, the proposed contribution by the Government of £100,000 is quite inadequate. The evidence given to the Committee has satisfied us that: 1. The knowledge of the circumstances attendant on the spread of miners' phthisis has not been such as to justify the contention that negligence on the part of the mining companies is responsible for the prevalence of the disease; and that 2. The supervision exercised by the Government has been inadequate, more especially in view of the fact that, as is shown by the reports of the Transvaal Government Mining Engineer for the years 1902 onwards, the growth of the disease and its effects were within the knowledge of the Government. We consider also that, as the men are not expected to contribute towards the provisions for cases to be dealt with by the compensation fund proposed to be established, the failure of the Government to make a substantial contribution renders the burden placed on the mines so heavy that in many cases, especially in those of low-grade mines, the margin of profit will be very gravely effected, a state of affairs which may have the most serious consequences, and which, having regard to the extent to which the finances and general well-being of the country are dependent upon the gold mining industry, we cannot contemplate without anxiety. The revenue, direct and indirect, accruing to the Government and the Railways from the mining industry has been for years past, and still is, so large as to justify completely the claim of the industry that in the present circumstances the Government should make a far bigger contribution than the £100,000 now proposed, exclusive of any expense incurred in administration and increased supervision. The Government, through the profits tax, have benefited by the fact that in the past no compensation has been payable by the mines, and this should more than counterbalance any loss of revenue through profits tax which may result from the diminution of the profits of the mines in consequence of the operation of the present Bill. Ministers, in dealing with the various measures on this subject submitted to Parliament last session, admitted the liability of the Government, and we fail to see that any convincing reply has been furnished to our contention that a substantially larger contribution than £100,000 could be made by the Government without causing any injustice to the taxpayer. Such a contribution would have greatly eased the position both for the mines and the men during the two years following the commencement of the Act.

Nigel G.M. Co.

The returns from the Nigel Company's mine for May are as follows: Gold, 4,718 fine ozs.; profit, £4,379; stamps working, 75; value of gold, £20,168; tons milled, 13,200.

THE MINERALS OF THE MURCHISON RANGE AND DISTRICT.*

Account of the Haenertsburg and Woodbush Goldfields—Gold-bearing Deposits of the Black Reef Series—An Important Government Report on the Results.

From an economic point of view the area falls, broadly speaking, into those more or less distinct portions the Haenertsburg and Woodbush Goldfields, where economic deposits occur either within or in close proximity to the Black Reef Series; a second and a most important belt coincides with the Murchison Range and its associated schist zones; the third portion covers numerous occurrences of mica (and corundum), along the northern side of the Olifants River and at Malelane. Another section of the country—round Palabora—has long been known for its interesting and extensive ancient workings for copper. Alluvial deposits of gold are also known in a few localities. 1. *The Haenertsburg and Woodbush Goldfields.*—Under this term are comprised numerous gold occurrences in the neighbourhood of Haenertsburg at or near the base of the Black Reef Series. There is abundant evidence of activity in former years, while at the time of the present survey active mining operations were much limited in number and extent. Some of the workings are found in the Black Reef Series itself; others are associated with reefs found in the underlying granite and schists. Gold-bearing deposits in the Black Reef Series, with the exception of one described below, are confined to bands of coarse conglomerate usually found at the base of the lower main quartzite, that is at the foot of the lowest conspicuous krantz on the slopes of the Drakenberg and Strydpoort Ranges. The presence of these conglomerates has been known for many years, and their persistence along approximately the same horizon has been established over many miles southwards along the Drakensberg, at least as far as the Devil's Kantoor, south of the Delagoa Railway. In the south of the present area, where the Lower Flagstone Group diminishes in thickness and finally dies out, the lowest quartzite rests directly on an eroded surface of granite, the conglomerates marking the line of contact, e.g., at Sabie. Round Haenertsburg and below Letaba Point the main conglomerate band lies between the Flagstone group and the lower quartzite, though subordinate conglomeratic beds also occur at the base of the series. They have been more or less extensively prospected, but have not hitherto shown permanent payability. At the old Pennyfather Mine, situated high up on the slopes of the Strydpoort Range on Lot No. 359, overlooking the valley of the Groot Letaba River, active mining operations were carried out some six years ago, but these have now been suspended for some time. The gold-bearing conglomerates rest with a sharply defined junction on the uppermost beds of the Lower Flagstone Group; the pebbles are mostly well rounded and consist of white close-grained quartz set in a blue or greyish medium-grained matrix with strongly marked quartzitic characters and containing crystals or crystalline patches of pyrites, in which the gold occurs. Further towards the west, active prospecting was carried out in 1911 at the site of the old Woodbush Mine below the Iron Crown and a little further west along nearly the same line, at Howard's Workings (Prince of Wales Reef). The old Woodbush Mine lies a little below the base of the Black Reef Series in a gully running down from the Iron Crown. The latter is the older name, derived from the fact that a black ferruginous reef was originally noticed at the surface. The associated country rock is a light coloured granite variety. The principal reef is known as the "Iron Crown Reef," composed of opaque white "hungry" quartz with much pyrites, dipping at 70° to the west and striking approximately north and south. A second reef, known as the "Never Despair," runs parallel to the Iron Crown Reef close by. In Howard's Workings, situated below the base of the Black Reef Series high up on the slopes below the Iron Crown beacon, soft whitish granite occurs on both sides of the Prince of Wales Reef, which is practically vertical, runs north and south, and varies from three feet to six inches in width. It is a quartz reef containing ferruginous matter due to oxidized iron-ore and carries rather coarse gold. An interesting zone of mineralised reefs within the Lower Flagstone Group occurs on the farm Crags No. 2569 on the eastern slopes of the Drakensberg, south of the Mamatzeeri, and has been worked intermittently for a number of years on a modest scale. The locality is shown on Plate IV. in the foreground; it is most romantically situated on the higher slopes of the Drakenberg amid scenery of exceptional beauty, and is well supplied with water and timber. The "reef" consists of a large number of thin brownish ferruginous quartz veins, which cut across the bedding planes of the country rock, the latter being made up by very soft highly decomposed thinly bedded shaly sandstones, alternating with harder darker coloured bluish greywackes. Owing, no doubt, to its position within the Mist-belt zone of more abundant precipitation, the decomposition of the country rock is far advanced, and frequently gives rise to an almost dead white fine sandy rock with a consistency like tooth-powder, against which the very large number of brown quartz veins and stringers are in sharp contrast. The latter are more or less parallel to one another, usually about half an inch or one inch thick and only a few feet apart. The workings are fairly extensive, very irregular, and mainly open cast; they have exposed a considerable number of reefs, which every now and then expand into "leads" or lenses, about eighteen inches thick and several feet long. It is from such enlargements that more profitable and consistent values are obtained. The direction of the veins is parallel to the joint plants of the overlying Black Reef quartzites, and traversing the mine ground are several minor faults, which run in agreement with the schistosity of the schist-belt further east. A typical reef consists of coarse dirty white or reddish quartz with irregular cavities derived from the oxidation and removal of pyrites; the country rock immediately outside the veins forms an impure rusty brown soft ferruginous zone, formerly containing abundant pyrites, now removed in every instance, and it seems that the pyritic zone will not be reached for some distance. There is evidence that practically the whole of the country rock is more or less mineralised, though it has been found that the irregular leads, pockets, and eyes carry most of the gold. As usual in the case of such quartz reefs, the softer, more earthy, and ferruginous the reef, the higher the gold content, since the latter is intimately and genetically associated with prevalence of pyrites and its oxidation products. The following up of pay-values is thus difficult to maintain, and the workings are correspondingly erratic. There can be little doubt that this deposit is genetically connected with the disturbances which have affected the Black Reef Series, during which favourable opportunities were afforded for the circulation of mineralised ground waters, and in this connection the structural features of the quartz-veins, their parallelism and orientation are significant. Prospecting operations have also been carried on further south near the base of the Black Reef Series in the upper courses of the Macoutsie River and elsewhere 2. *The Economic Deposits of the Murchison Range and its Associated Schist-belts.*—The occurrence of gold in this part of the Low Country has been known for many years; in spite of the fact that gold has been obtained here and there in promising quantities, most of the mines have had to suspend operations, and during recent years there has been a decline in mining activity, so that the Murchison Range has acquired a somewhat unfortunate reputation. The reasons for this state of affairs are not far to seek. In the first place, the gold-bearing deposits are very uncertain, occurring for the most part in ill-defined lenticular bodies or more indefinite mineralised zones, having none of the characters of a true reef with defined hanging and foot walls. These geological conditions of occurrence obviously necessitate a more extended period of thorough prospecting and development, and there is reason to believe that the importance of such preliminary work has not always been sufficiently realised. Judging from the spectacle of abandoned machinery which meets the traveller in the Low Country over and over again, mining ventures seem to have begun in some cases on too ambitious a scale. Apart, however, from drawbacks which result from the geological conditions prevailing along the Murchison Range, there are two serious handicaps, which in the past have prevented successful mining operations. These are the want of transport facilities and the absence of a sound and reliable water supply. Fortunately the completion of the Selati Railway in the immediate future will remove one of these drawbacks, which in years gone by has sometimes been the main reason for a too hasty condemnation of the economic prospects of the Murchison Range. The second fundamental difficulty has not yet been removed and still threatens to seriously delay the natural advance of the local mining industry. Though recent boring operations have been the means of supplying a limited amount of (sometimes inferior) water, available at suitable points along the reef road and elsewhere for the requirements of the traveller and prospector, this merely touches the fringe of the problem, and stands in no relation to the legitimate requirements of more thorough prospecting and developing operations. Fortunately the proximity of the Drakensberg on the west, with its magnificent and perennial water supply now running to waste, affords a natural solution, while the configuration of the country renders its supply available by gravitation, so that the removal of this second great drawback may perhaps also be looked forward to in the near future, without which the natural development of the mineral wealth of the Murchison Range must continue to suffer a severe setback. A further important difficulty depends on the sometimes bad climatic conditions. There is no doubt that when all allowance has been made and every available precaution been taken advantage of, the fact remains that, except during the winter months, when a stay in the Low Country is both safe and pleasant, there are serious climatic drawbacks connected with the Murchison Range and the surrounding country. They may perhaps have been exaggerated in the past, and the marked decrease in vital energy which rapidly follows physical exertion during the summer months may be due, at least in part, to more human weaknesses—which require no further specification. There seems no doubt, however, that for many years to come the factor of climate will have to be taken into consideration in estimating the economic possibilities of the Low Country. During the last year or two active mining operations were carried on at the Griffin Mine, south-east of Leydsdorp, along the Antimony belt at the United Jack Gold Mining Company, the Weigel Gold Mining Company, the ground adjoining the Free State Mine on the east (Weigel Consolidated), at the Senator and Quagga Camps still further east, and at the Guide Copper Mine at Palabora; some of these workings have since ceased. The Griffin is the only, at present, producing mine.

(To be continued.)

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* From Memoir issued by the Geological Survey.

MAGALIESBERG TOBACCO · RUSTENBURG TRANSVAAL
HUMDEL & HERZFELD
SUPERIOR
SELECTED
TRADE MARK
MAGALIESBERG
TOBACCO
"EXTRA SPECIAL"
Horseshoe Tobacco

NOTES ON STOPE TIMBERING.

Some Practical Hints—The Use of "Pigstyes."—Where the Timberman Fails.

It is a fairly general rule nowadays on the Rand that the hand stoper is responsible for the timbering of his working place, as his "face" advances and occasion requires. It is apparent, however, that many a good "stoper" fails when it comes to timbering, and, in fact, many timbermen are guilty of incompetence or carelessness in the fulfilment of their daily task. The following remarks, therefore, may not be out of place. Having decided that a "prop" is necessary, the best heading possible within the permissible area should be chosen. The heading should present a fairly smooth surface for the head of the "prop." This will usually be secured by a little chiselling. If the position is near the face of the stope, the "prop" should have a solid bearing on the far side, which is often possible if the hanging wall is uneven. If no solid bearing is available, a short hole should be drilled on the far side and an iron plug or peg driven in. This is especially desirable in machine stopes, and is done after the stick is in position. A very good idea, when driving the "prop" "home," is to "allow a little for the blast," that is to say, by giving the head of the stick the slightest inclination towards the "face"; the blast will wedge it "home." Many men chop the foot of the "stick," to make it fit the "hitch," thus reducing the section and leaving only a portion of the prop to sustain the pressure, so losing the full advantage of the diameter of the prop. The "hitch," therefore, must be made of a size suitable for the "prop." The common method of putting in a "prop" is to drop the foot into a round "hitch," drive it down into position at the head, and finally hammer in several wooden wedges between the hanging wall and the head.

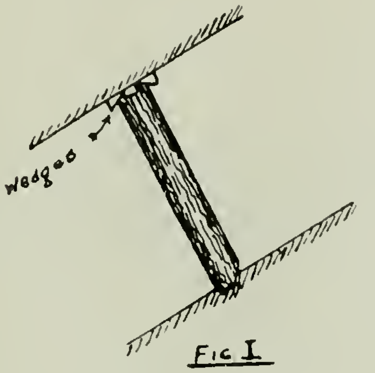

Fig I
Common Method.

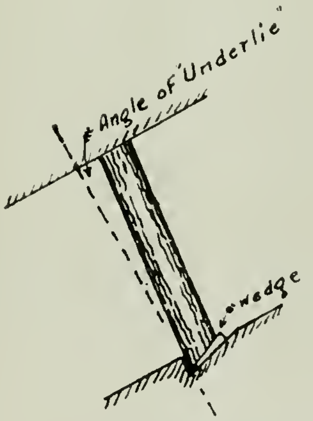

Fig. II
Preferable Method

A preferable method is to cut the "hitch" with parallel sides, starting from the level of the footwall at the top of the "hitch" and sloping the seat of the "hitch" at a steeper angle than the dip of the stope. (See Figure II.) In measuring the length of "prop" required, the length of the undermost side should be taken, and the angle made by "heading" and "hitch" carefully noted either graphically on to a wedge or in degrees. In cutting the timber, it is good practice to arrange that the larger diameter is against the hanging wall. The "timber" is placed in position and driven "home" in the usual way, but the head should be a true fit to the chiselled "heading." Two or more wedges, according to the size of "timber" used, are then driven from the heel downwards underneath the "prop."

These wedges are down in the hitch out of the way, and are therefore safe from injury. No "timber" should be put in a stope—other than a flat stope—without an "underlie." That is to say, the "timber" should make a slight angle uphill with a line at right angles to the dip. (See Figure II.) This angle is called the "underlie," and should be one-sixth to one-fourth of the angle of dip of stope. It is good practice to use only timber from which the bark has been stripped. Leaving the bark on encourages insects and fungus growth. The ratio of diameter of timber to length is sometimes given as 1 to 12 (inches to feet), but this gives too small a diameter altogether. A ratio of 1 to 8 is about right. Crooked timber should not be accepted on a mine, as the fibres in such timber do not equally sustain the pressure, some receiving more than their share and some less, thus tending to bend the stick and finally break it. For gradual and irresistible "weight," tapered props are used. The end of the "prop," next the footwall, is tapered; the result being that the prop curls at the tapered end and therefore allows settlement of the hanging wall without injury to the timber. The same result is obtained in a lesser degree by putting a "headboard" of softer wood (deal) between the "prop" and the hanging wall. This is often done when timbering heavy ground. One can then tell as soon as "weight" comes on by the squeezing of the "headboard." In discussing a paper read recently in Johannesburg, it was stated that "props" should not be further from the face than 25 feet and packs 50 feet. This is true enough, but

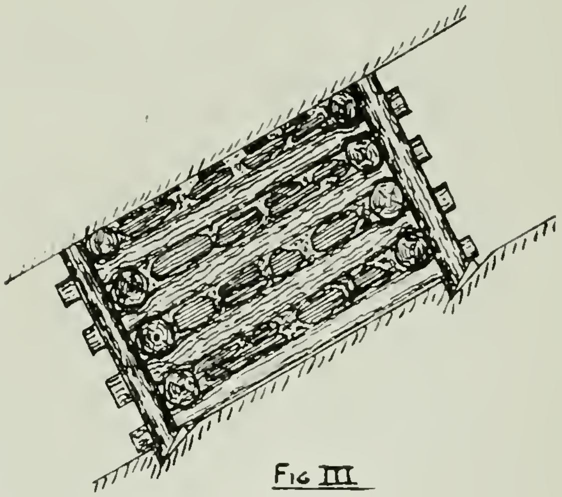

Fig III
Pigstye

on the other hand either can be placed as close to the face as 6 feet if properly put in, although headboards cannot be used at such a short distance.

Pigstyes (chocks) are most useful for steadying heavy ground. If built with corner posts, these posts should not be cut from stout timber. A "pigstye" is usually made of 6, 12 or 14 feet lagging, and the corner posts should be cut from the same material. The idea is to allow the weight of hanging to settle solid on the filling, which it cannot do if the corner posts are of stout timber. In the latter case the "weight" either breaks the corner posts and comes suddenly on the "pigstye" or the posts are forced through the hanging. In either case the hanging breaks and falls around the pigsty.

SYSTEMATIC HAND STOPING ON THE RAND.

A "Corner Stone" in the Knowledge of Mining.

[BY A CORRESPONDENT.]

PART II.

(c) Now for a start let us take the every day case of a man—who intends to work systematically—starting in a stope which has been worked without system. We will suppose it an easy stope, with good foot and fair hanging, about 4 feet wide, and the angle of the face with the drives correct. It is an easy face; it is good breaking ground, therefore the man with a method will find it more difficult to beat the man with haphazard methods than under more difficult conditions; but I wish to illustrate a simple case first—I shall come all the quicker to the point. The new man will find plenty of places where he can drill, but the best places in such a stope will only be small benches, the width of which will be the width of the ground which one hole will break—say 18 inches. The new man decides to make benches 54in. wide (18in. by 3ft.), and as he has a good foot, he decides to put in two holes in the foot to one in the hanging. His object in carrying benches 54in. wide is to give his boys room to put two holes in the foot with as much ground on the collar as on the bottom of each hole. As he is working an east face (*i.e.*, left-handed face), and his boys are right-handed, he cannot do this with a narrower bench than 54in. (he is taking 18in. of ground on each hole). After he has put in his two bottom holes and blasted them and pinched down the loose overhanging face, he will find (in a stope of this description) that one hole in the hanging will square the bench.

You will now have broken 36in. of your 54in. bench. You don't put a boy on the 18in. bench left; you leave it until the bench above comes down to it, for the following reason: If a right-handed boy attempts to put a hole in an 18in. bench on a left-handed face, the hole he puts in must be "looking in," that is the bottom of the hole will carry much more ground than the collar. Such a hole, if 3ft. long, will break a piece of ground the shape of which is 6in. at the collar of the hole, 18in. at the bottom of the hole, and 36in. long, equal to 432 sq. in. He cannot put the hole in square with the face, for he has no room (*i.e.*, the 18in. bench is not wide enough). On the 54in. bench each of the holes put in are square with the face, and therefore each break 18in. by 36in., equal to 648 sq. in., a difference of 33 per cent. in favour of wide benches. He also gains one hole in four; by undercutting he makes three holes do the work of four. But it will be asked, Why cannot the man who works haphazard undercut also and save top holes? I have seen them get the idea of undercutting and try to do it, and nothing ties a man up in a knot quicker than trying to undercut the usual irregular, shapeless face of a stope which has been worked without system.

I have shown that a hole put in on a small bench, under the conditions described above, breaks one-third less ground than the hole which can be put in on a large bench. But (on an east face at least) the majority of the holes in a stope worked without system have to be put in "looking in." Many of them are purely "cutting in" holes, with nothing on the collar and 18in. on the bottom of the hole, which break just half what a well-placed hole breaks. To put it in a nut-shell, the systematic worker breaks rectangular portions of ground with the same labour and powder that haphazard man breaks triangular portions of ground, the triangles being only half the area of the rectangles, and, as every one knows, these cutting in holes are much more likely to be put in the wrong direction by the boys than a hole which is put in square with a good bench.

Again, these "looking in" holes alter the angle of the face with the drives and rob the ground from the benches above. When these benches come down to them, they run out to nothing, and the next hole has got to be a "cutting in" hole pure and simple, which can only break half the ground it should break. The holes in a stope worked haphazard: (1) are much more difficult to plan; (2) the boys have often to drill in awkward positions; (3) the boys are more inclined to put their holes in wrong than in a stope worked with a system.

I have tried to show the advantage of some kind of a system even in an easy stope, where any one can make a living. It can be proved that system is more useful in difficult places. But more than half the difficulties a systematic stoper encounters are not natural difficulties, but are difficulties which can and should be removed and would be removed if the principles and advantages of systematic work were better understood on the Rand.

Jumpers-cum-Treasury.

The following is the result of the joint working of the Jumpers and Treasury Mines during last month: 80 stamps, working 25 days, crushed 8,100 tons, yielding 2,162 ozs. of fine gold from mill, 1,207 ozs. fine gold from tailings by cyanide, 379 ozs. fine gold from current slimes, and 200 ozs. fine gold from accumulated slimes; total from all sources, 3,948 ozs. fine gold. Value of output, £16,580. Joint profit for month, £2,004. Position of joint gold reserves at end of last month, 1,346 ozs. fine gold.

Piggs Peak.

The output for May at the Piggs Peak Mine is as follows: 25 stamps ran 26·6 days, crushing 3,000 tons yielding 566·55 ozs. Cyanided 3,045 tons, yielding 364·93 ozs. Concentrates shipped 7,788 tons, containing 280·5 ozs. Total recovery from all sources, 1,211·97 ozs. fine gold, valued at £5,148. Working costs, including development, £2,146. Estimated profit, £3,002. A certain amount of time was lost owing to necessary repairs to the power line, Pelton wheel and pumps. Prospecting has been started on the Ruby Creek Concession, in extent approximately 20,000 acres, particular attention being paid to tin occurrences.

MINE RESCUE WORK AT WITBANK.

Colliery Managers Meet—Interesting Discussion.

The keenest interest is being taken in rescue work in the Witbank district. On Sunday last the managers of the various collieries congregated and the subject was fully discussed. Mr. J. Curthew Sanders (of the staff of Messrs. Reunert & Lenz), the expert in rescue appliances, was invited down for the occasion, and delivered a most interesting lecture on the subject, which was greatly appreciated, after which a full discussion was entered into. Mr. J. G. Howard, the manager of the Transvaal and Delagoa Bay Colliery, took the chair, and in a short speech introduced the visitor. Mr. Sanders then delivered his lecture, and commenced by outlining the need for rescue apparatus and giving the nine essential qualities which all rescue appliances should possess. Then he proceeded to trace the history of such, showing clearly how the first step in this direction originated in a small way so far back as 1860, when appliances were patented, which absorbed the carbon-dioxide from the exhaled breath. He next showed how, at a colliery disaster in Silesia, in 1895, the need for a portable oxygen apparatus was more than ever felt, and immediately following this disaster the best technical advice was sought, and the first type of rescue apparatus, crude but serviceable, was evolved. This apparatus was of the compressed oxygen type, and this was the basis upon which the various types of compressed oxygen appliances which are in use to-day have been built. This type was fully dealt with and the drawbacks carefully explained. The intricate mechanism, the liability of valves and injectors getting out of order, and the probability of the compressed oxygen leaking from the cylinders, while the apparatus is hung at the rescue station, were all clearly pointed out. The compressed air type was also mentioned, and was shown to have in addition to similar drawbacks, the extra feature of bulkiness, which militated against its success in rescue work more especially in low galleries. The "Pneumatogen" (1911) was exhibited and explained in detail. The simplicity of its construction was at once apparent to all, and the complete absence of valves, injectors and other parts liable to get out of order was a most noteworthy feature. The principle of this apparatus is the filtering of the breath through layers of dry granulated peroxide, and it has been found after many years of experimenting by Professers Dr. Bock and Dr. Bamberger, of the Vienna University, that potassium-sodium-peroxide gives ideal results. The weight of the "Pneumatogen," namely, twenty-two pounds only, appealed most favourably to all present, whilst the fact that, owing to its compactness, a man wearing it could pass through an aperture eighteen inches square, was another excellent feature. Further, the fact that this apparatus can be hung up ready for immediate use for an indefinite time without the least fear of deterioration or loss of oxygen, makes it the ideal type for this district. Another point worthy of note is that the apparatus is English made, the Wolf Safety Lamp Company, Ltd., of Leeds, being the owners of the patent rights. The appliance was shown in use and created great interest. The chémical formula was neatly and clearly explained, showing explicitly how the oxygen is generated from the wearer's own breathing. At the close of the lecture matters pertaining to rescue appliances and rescue work were fully discussed. Mr. Howard, in moving a vote of thanks to Mr. Sanders, stated, *inter alia*, that the information given in the lecture was indeed most interesting and enlightening, and he was sure that all present earnestly hoped that Mr. Sanders would be able to be with them more frequently. A word of praise is due to Mr. E. Soar, the acting manager of the Witbank Colliery, who had all the arrangements in hand, and to whose efforts the success of the gathering was due.

MINING MEN AND MATTERS.

Sir Lionel Phillips, Bart., M.L.A., has sailed for Europe.

* * * *

Mr. Drummond Chaplin, M.L.A., has returned to the Rand.

* * * *

The graduates of the Royal School of Mines held their annual dinner on Wednesday night. During the evening greetings were cabled to those present at the annual dinner in London.

* * * *

Mr. Douglas Christopherson, joint manager of the Consolidated Gold Fields, left to join his family in England by Saturday evening's limited express, and was seen off by a number of friends.

* * * *

The annual general meeting of the South African Institution of Engineers will be held this (Saturday) evening, at 8 p.m., in the Council Chamber of the Chamber of Mines. The chief items of business of the meeting will be the announcement of the result of ballot for election of officers and members of the Council for the 1912-1913 session; the presentation of the annual report and balance sheet and the honorary president's and president's valedictory addresses.

* * * *

The next monthly meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 17th June, at 8.15 o'clock. The following papers will be open for discussion: "The Normal Section of the Lower Witwatersrand System on the Central Rand, and its Connection with West Rand Sections," by E. T. Mellor, D.Sc.; "On an Interesting Dyke Intrusion in the Upper Waterberg System," by P. A. Wagner, D.Eng., B.Sc., M.E.; "The Nama System in the Cape Province," by A. W. Rogers, D.Sc.; "Iridosmine from the New Rietfontein Mines: Its Occurrence, Analysis and Genesis," by C. Baring Horwood, B.Sc. (Lond.), A.R.S.M., A.M.I.C.E. The following papers will be read: "Topography and Geology of the German South Kalahari," by Dr. Paul Range (postponed from last meeting); "Note on a Specimen containing Bastnäsite and Wolframite from Welgevonden No. 777," by D. P. McDonald, M.A., B.Sc.; "Note on the Relationship between the Black Reef Series and the Underlying Diabase," by C. Baring Horwood, B.Sc. (Lond.), A.R.S.M., A.M.I.C.E.

MINING EXAMINATIONS.

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Rhodesian Section.

LATEST NEWS FROM THE MINES.

New Shaft for the Globe and Phœnix—Diamond Drilling at the Shamva—The Oleander Mine—Rhodesian Engineers and Mr. Ackerman—A Somabula Discovery—The Tyne Mine—Returns from the Peach Property—Eldorado Developments.

A NEW vertical shaft is being sunk at the Globe and Phœnix mine. Sinking operations were commenced last week. The shaft is situated about 2,100 feet from the present Phœnix headgear, and probably two years will elapse before connection is effected with the existing underground workings. The dimensions of the shaft are to be 17ft. by 6ft. 6ins., and steel sets are to be used—an innovation, we believe, in Rhodesia.

* * * *

A diamond drill hole is to be driven into the Shamva Mine at its base, and it is expected that the reef will be picked up at this depth. Should expectations be realised, this development will have a most important bearing on the mine and its future. During mail week the consulting engineer despatched the following cable from Bulawayo to the London office of the Shamva: "No. 3 level east drive cross-cut No. 4 north reef exposed up to date 45 ft., average assay value 7·2 dwts., cross-cut continuing, present face low value." It was rumoured in London in mail week that further developments had given unsatisfactory results, but enquiries made at the local office of the company elicited nothing that would give substance to the rumour. The monthly report from the mine is expected to be ready for publication in the course of a week or so.

* * * *

Milling tests having given satisfactory results, the Oleander Gold Mining Company has purchased the Arlandzer mine from Mr. N. A. Arnold. This property is situated some two miles from the Oleander and one mile from the Turkois. The occurrence is very similar to the Turkois mine. Development at depth on the Oleander itself is very satisfactory, and it is expected the battery will henceforth be running full time.

* * * *

A few weeks ago reference was made in the columns of this journal to the dual position occupied by Mr. A. H. Ackerman, who is consulting engineer to a number of Rhodesian mines, as well as Resident Mining Engineer to the British South Africa Company. Advices from Salisbury now state that the leading mining engineers and metallurgists of the country are taking action in the matter. In their fight with the resident engineer of the B.S.A. Company, the mining engineers and assayers of Salisbury and Bulawayo evidently mean business. The insurrectionists include Messrs. T. J. M. Macfarlane, R. Butler, R. C. H. Cooke, F. T. Mumford, P. R. Evans, M. Epton, A. S. Wheeler, and G. Dixon, of Salisbury, and Messrs. C. H. Pead, H. T. Brett, L. Evans, Dudley Inskipp, S. T. Watts, G. A. Pingstone, and S. C. Dyer, of Bulawayo. They have appointed Messrs. Dixon, Wheeler, Pingstone, and Pead as a deputation to wait upon Mr. Birchenough, and to represent to him the unfairness of the competition which the metallurgists and assayers of the territory have to contend with from Mr. Ackerman and his department, and the case they will submit is certainly a strong one from their point of view. The deputation will draw attention in particular to Mr. Ackerman's reports on the Eileen Alannah, Kimberley Reefs, Connemara, Pretty Polly, Esperanza and Turkois mines, and they will object to the appointments he holds as consulting engineer to the Mashonaland Agency, Rhodesia Reduction Company, and Willoughby's. It will also be pointed out that the B.S.A. Company's Mines Development Company has the advantage of Mr. Ackerman's office and staff for examinations, sampling and assaying at prices too low for local men to compete with, and, further, that the fact that Mr. Ackerman signs reports as the Chartered Company's Engineer gives an importance to his name and opinions which leads people to seek his assistance in preference to that of others. It is contended that such reports should be made for the sole use of the B.S.A. Company and not for publication, or "for the promotion of public companies." It appears, moreover, that Mr. Ackerman advertises in English and American papers, to which the local metallurgists take strong objection. Finally, the deputation will call Mr. Birchenough's attention to the effect of this competition on assistants employed by the parties concerned, and they will enter a strong protest against sampling, assaying and drafting being done for Mr. Ackerman in his private business by those employed in the resident engineer's office.

* * * *

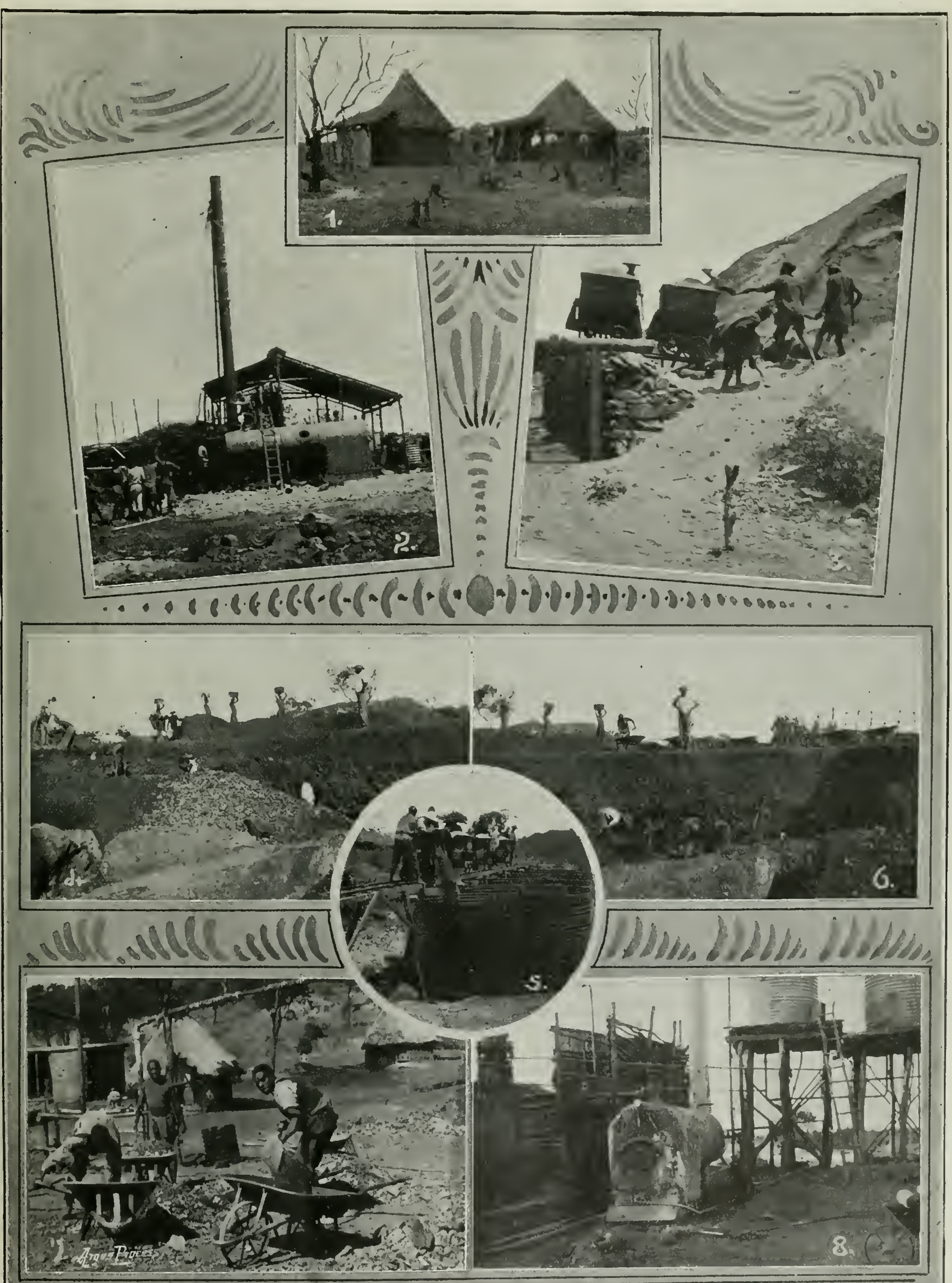
A report is to hand from the alluvial fields at Somabula of the finding, last week, by a digger named Vernon, of a diamond weighing 37½ carats. This stone, which is said to be of good quality, is the largest yet discovered in Southern Rhodesia.

* * * *

It is reported from Hartley that milling on the Tyne mine has ceased, and that most of the machinery and plant is being sold. This property appears to have had an unhappy career indeed. A company was formed to work it in the latter half of last year. The capital was £100,000; £30,000 was for working the property, £45,000 went in vendors' shares, and £25,000 was held in reserve. Sir David Harris was appointed chairman of the directorate, with Mr. H. F. Olds manager of the property. Glowing statements were made of the state of the mine. Certain portions were described as being undoubtedly rich, and about October last there was reported to be sufficient ore in sight to keep the three 5-foot Chilian mills at work for over two years. The ground, it was said was easily mined, and offered no metallurgical difficulties, and working costs, therefore, should be low. An eloquent commentary on this is provided by the fact that the Tyne, since the flotation of the company, has appeared in the output list, so far, only for February and March and for April. In the former months, combined, the production was 601 ozs. from 2,751 tons, and in April 220 ozs. from 1,550 tons.

* * * *

The returns from the Peach property for the last two months have been an eye-opener to many Bembesi residents. Originally owned by Mr. Gilpin, the ex-tributor of the Morven, the claims, it lay undeveloped for some considerable time. Finally the owner formed a small syndicate, and an 80ft. shaft was sunk in which exceedingly good ore was encountered. The trial crushings made in March and April were from this development rock, and returns exceeded the wildest hopes of even Mr. Gilpin. The March return was 126 ozs. from 80 tons, while a return of 4 ozs. per ton was the result of reduction of 30 tons in April. But little driving has been executed in the main winze; still, the prospects of a continuance of the chute are bright, a 30ft. winze some distance away having disclosed further high values. The owners have purchased the Morven batteries and suction



VIEWS ON TYPICAL RHODESIAN SMALL MINES.

1. A Small Worker's Home. 2. Erecting Plant. 3. Trucking Tailings to the Cyanide Plant. 4 & 6. Rubble Pit on the Pickstone Mine, out of which £15,300 worth of gold was recovered. 5 & 7. Transporting Ore. 8. Plant in Course of Erection,

gas plant, which, when renovated, will start upon the work of reduction. It is their intention, I believe, to continue developing, crushing, as far as possible, only development rock. A pumping plant is also to be installed.

* * * *

The quarterly report of the Eldorado Banket G.M. Co. includes a schedule of the lengths and values of pay rocks on the different levels as at the 31st March last. This shows that on level No. 1, the length was 930 ft., the value, as exposed in the drive, and after the reduction of high values to 100 dwts., is 12·02 dwts., and the width exposed 5ft. 3in.; on level No. 2 the respective figures are:—1,055 feet 18·68 dwts., 5 ft. 5 ins.; No. 3: 955 ft., 14·50 dwts., 5 ft. 10 ins.; No. 4: 912 ft., 18·21 dwts., 6 ft.; No. 5: 1,073 ft., 1 oz. 3·12 dwts., 6 ft.; No. 6: 940 ft., 14·89 dwts., 6 ft.; No. 7: 790 ft., 15·93 dwts., 6 ft.; No. 8: 330 ft., 1 oz. 2·50 dwts., 6 ft.; No. 9: 110 ft. (main reef), 1 oz. 2·90 dwts., 6 ft. 1 in. The first five levels are partially stoped out, and from the 6th level a small tonnage has been stoped. The consulting engineer reports that no definite statement can be made as to the pay ore opened up on the parallel reef at the 9th level, until various cross-cuts have been completed. The main incline shaft was down 1,216 ft., which is some 30 ft. below the 9th level, and the new main vertical shaft, from which the development on the mine below the 9th level will be carried on, was down 778 ft.

RHODESIAN ENGINEERING NOTES.

The new plant at the Gaika mine is now in full swing and everything is reported as running smoothly.

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The extension of the railway northwards is making progress. The engineers are now constructing a temporary bridge across the Lufiru.

* * * *

A Tremain mill has been ordered for the Madzimoio property in North-Eastern Rhodesia. Assays are reported to give values up to 94 dwts.

* * * *

The meeting of the Union Minière du Haut Katanga, was held in Brussels on the 9th ult., when the scheme for the increase of the capital was approved. The new capital will provide for the installation of a second water jacket and coke ovens to be fed with coal from the Wankie Colliery. The Board announced that the experiments made with the electro-metallurgical treatment of copper have given satisfactory results.

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Four additional 20ft. diameter cyanide tanks are being erected by Hogarths Metal Works, Limited, for the Old Nic mine.

* * * *

It is stated that the North Charterland Company have decided to try mechanical transport between Fort Jameson and Tete.

Situations Wanted.

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Native Labour in Rhodesia.

A correspondent, writing to a Rhodesian paper, raises a highly interesting question in connection with native labour. He writes: In reference to the shortage of native labour in the mines and also in the farming districts of Rhodesia, I should like to point out to those interested in the matter that thousands of natives who at the present time never leave their own districts to seek legitimate employment would be compelled to do so if they were not permitted to carry on as they do annually the unlawful practice of alluvial gold washing in the rivers, the two rivers mostly worked by natives being the Mazoe and Ruenya. I have lived on that part of the Ruenya where gold washing has been carried on for the past two years, and I can state without fear of contradiction that thousands of natives pay their hut tax annually from the sale of gold recovered by them from the rivers, at which work men, women, and youngsters take part for about four months in each year, the gold recovered being disposed of mostly to Indian traders from the Portuguese side. I may add that at the moment the Portuguese authorities are forming outposts along the river banks in their territory in order to stop the natives from alluvial gold washing, so that if our Government would step in and put a stop to this industry on the British side we should have quite a large number of natives both from our own territory and from that of the Portuguese being compelled to seek employment, which I am sure would facilitate matters considerably for those requiring native labour." We ourselves have had some experience of the rivers referred to, and know that as stated in the above a large amount of gold is recovered by natives therefrom.

Aluminium.

Aluminium, comparatively few years ago a rare metal, too expensive to have any particular economic value, has to-day come into wide use in a great number of industries. The consumption in the United States in 1911, according to the United States Geological Survey, was 46,125,000 lbs., the price in New York ranging from 18½ to 22 cents per lb. The use of the metal aluminium and its alloys in automobiles, dirigible balloons, and aeroplanes is constantly increasing. In the form of magnalium it is used in the beams of analytical balances, and other new alloys are being constantly brought to public attention. The metal is also employed in paper decorations and for wrapping. It is reported to have been used in the textile industries, where it has been combined with silk, to which it imparts a peculiar brilliancy, particularly adapted to theatrical and ceremonial costumes. It has found and is constantly finding a host of applications in smaller articles of everyday use and ornamentation. The Ordnance Department of the United States Army recently awarded a contract for sixty thousand, or more, aluminium canteens and cups. The metal is now being used in various other ways in the light field equipment of the Army.

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POSITION OF TANGANYIKA CONCESSIONS.

Statements in the Directors' Report—The Coke Question—Diamond Pipes.

The report and accounts of the Tanganyika Concessions, Limited, to September 30 last, cover a period of fifteen months. The directors recall the fact that at the meeting held in December last Mr. Robert Williams dealt at some length with the smelting operations of the Union Minière du Haut Katanga, and pointed out that the costs during the trial runs, which were higher than had been originally anticipated, were being reduced. The results obtained since that meeting are embodied in the following report from Messrs. Robert Williams and Co., dated May 13, 1912:—"We are now in a position to give you from reports and letters just to hand from our engineer, Mr. Allan Gibb, and our metallurgist, Mr. F. E. Studt, further details with regard to the copper smelting at the Star works, which will show you the position of affairs since Mr. Williams addressed the shareholders in December last. In the reports we refer to, it is pointed out that the work during January and February at the smelting works was entirely experimental, and the results obtained should form a basis for future work. During the latter part of March and the beginning of April the results have been applied to continuous work, which have been satisfactory. A good run of the furnace was made on washed green ore for about eight days, during which time 740 tons of that ore were smelted, and over the latter part of this period the balance was done with the remainder of the stock of Wankie coke, amounting to about 100 tons. By using this washed ore the grade of the mixed ore was raised to over 16 per cent. of copper, while the actual recovery was just over 12½ per cent. of the dry ore mixture. The production averaged nearly 18 tons of bars per day, containing about 97 per cent. of fine copper. The using of this washed ore thus materially increases the capacity of the furnace, by reducing the proportion of flux and raising the grade of the charge, and reducing the fuel consumption. The following are the costs of smelting with European and Wankie coke:—When European coke alone was used, the total cost of the fine metal in bars amounted to about £41 10s. per ton on trucks at the works. Replacing this by Wankie fuel at £6, the cost of the fine metal in the bars put on trucks at works would be £26 per ton. Three days, during which the coke used was partly Wankie, resulted in an actual cost of £30 per ton on trucks at works. The first of these three days commenced with European coke, whilst the last day also finished with European coke after the Wankie fuel had been used up. During the day on which the Wankie fuel alone was used, the actual cost of the fine metal on trucks at works was only a little over £24 per ton. When the washing arrangement, which at present is a roughly improvised one, is improved upon, the production can be kept up to 20 tons of metal per day, or about 600 tons per month, with the present furnace, and this at a cost which will land the copper on the European markets at a little over £30 per ton of fine metal. We are sending the above information, which has just come to hand, as we are sure the shareholders will be glad to have these figures.—Yours faithfully (signed) Robert Williams and Co."

The Union Minière du Haut Katanga held a meeting of its shareholders in Brussels on the 10th ultimo, when it was decided to increase the capital of that company by the creation of 25,000 capital shares of £4 each, and an equal number of dividend shares, and issue debentures up to an amount of £400,000. The capital shares will be offered in the first place to the holders of all the old shares. The arrangements referred to above in connection with the increase of the Union Minière's capital secures to the company an allotment of a further 10,000 dividend shares in respect of the 40 per cent. to which it is entitled on any increase of capital. The chairman of the Tanganyika Concessions stated at the meeting held in December last that arrangements had been made for the payment of the debenture interest in July. From negotiations now in progress the directors have every confidence that the future commitments of the company will be duly met. The company's railway assets are turning out very well. The Rhodesia-Katanga Railway has made satisfactory progress, and the earnings have exceeded the amount expected for the first year. The total receipts for the twelve months show a balance in excess of expenditure of £63,074, which is considerably over the amount required by that company to meet debenture interest. The extension of the railway from the Star of the Congo to the Kambove mine is expected to be finished before the end of this year. This will, when complete and open, influence the traffic over the Rhodesia-Katanga Railway satisfactorily. The policy adopted by the directors in assisting the further construction of the Benguella Railway in section has been continued. Under a contract entered into in December last, the line to Huambo, a distance of 430 kilometres from Lobito, is now being actively constructed. The importance of this railway in the future development of Katanga cannot be overestimated. On the completion of the section now being built, the traffic will be considerably increased. In the report of the Benguella Railway Company issued in October last, it is stated:—"When railhead shall have reached Huambo or, better still, Bihe, our line will act as a powerful lever in the development of both commerce and agriculture, whether directly towards lowering the cost of transport or indirectly in allowing the thousands of natives engaged now as carriers to be employed in agriculture, thus creating an appreciable increase in our receipts. It is sufficient to consider the vastness of the area which our line will serve, the importance of its native population, their commercial and industrial instincts, and consequent necessaries they will require, as also the great variety of articles the country produces, such as rubber, cotton, wax, grain, mendobi, amendoim, also cattle raising, to be absolutely sure of the increase in traffic which our railway will gain." Extracts from the last report issued by this railway company show that a steady increase in the railway receipts has been made year by year, which has fully justified the assistance given by the Tanganyika Company.

As mentioned in the circular sent to the shareholders in May last, an agreement was entered into with the Special Katanga Committee for the joint exploitation and development of the diamond pipes. During the year some prospecting work on a small scale has been carried out, but only a few small diamonds have been discovered, and nothing of importance upon which to lay any emphasis. The agreement between Mr. Robert Williams, the managing director, as approved by the shareholders in April, 1905, expired by effluxion of time in December last, and this has been extended for a further period of five years.

Government Mining Areas.

The following communication, dated June 10th, has been received from the offices of Government Gold Mining Areas (Modderfontein) Consolidated:—We beg to give you below copy of a cable despatched to our London Office this morning:—"North-west shaft Main Reef, 27 inches wide, has been struct at 2,395 feet; looks well. Assays being made. Will you publish." The assays of the reef will be published as soon as they are completed over the whole section of the shaft.

The following is a copy of a cable which has been despatched to London:—"Referring to our telegram of the 10th, average value of reef 7·13 dwts. over 31 inches. Reef in the northern part of shaft is in one body, but a hanging wall leader separates out towards the southern end of shaft. Publishing."

THE YEAR WITH THE T.G.M.E.

Net Profit Increased to £205,103—New Power Station in Operation—Result of Prospecting Progress at Central Mines, Elandsdrift, and Vaalhoek.

THE T.G.M.E., in the year ended March 31, 1912, made a net profit on working of £205,103 19s. 3d., and this amount, together with the balance brought forward of £60,118 9s. 3d., funds transferred £1, and £191 0s. 6d., unclaimed dividends written back, has been dealt with as follows:—Mining Taxation Act, 1910, £18,582 10s. 2d.; dividend account, £166,165 5s. 6d.; balance of appropriation account carried forward, £80,666 13s. 4d. The cash and cash assets, after deducting liabilities, amount to £80,666 13s. 4d., in addition to which there is still an amount of £26,638 9s. 5d., remaining from the issue of £124,000 5 per cent. first mortgage debentures. Of this, however, £20,792 18s. 9d. have already been allotted to sundry items of further expenditure, including the Elandsdrift power station, Peach Tree compressor plant, electrification of the Jubilee tramline, extension of cyanide plant, crusher station, etc., which will give the Central Works a capacity for treating 13,000 tons per month. The total expenditure on capital account during the year under review has amounted to £13,393 5s. 8d.

MANAGER'S ANNUAL REPORT.

In his annual report on the Company's operations for the year ending 31st March, 1912, the General Manager writes *inter alia*:—Prospecting Operations.—Klipkraal, No. 460.—Although the proclamation of this farm has been withdrawn (nothing of a payable, or even of an encouraging nature having been found), prospecting had to be continued, and is still carried on at this farm, in conformity with the wish expressed by the Government at the time of the withdrawal of the proclamation. The work done here has been considerable, amounting to 2,937 feet driven, risen and sunk, and 1,024 feet of trenching and cutting, while the total amount of work done is 6,012 feet driven and sunk, and 10,495 feet of cutting and trenching. Hermansberg, No. 1035.—As mentioned in last year's report, work has been continued on this farm with a prospecting party, and an inter-bedded reef has been located about the horizon of the Theta Reef, but although 480 feet have been driven, no payable values have been disclosed. A large body of low-grade float is also being opened up, and although every endeavour is being made to ascertain its value by trenching and careful sampling, I am not yet able to form a definite opinion as to its payability. Altogether 2,111 feet have been driven, risen and sunk, and, in addition to this, 433 feet of trenching, and 1,098 feet of cutting have been done. Ponieskrantz, No. 1351 (North).—In the month of January last prospecting work on this property was stopped, and the native labour transferred to Duke's Hill South. Of the 3,625 feet, which is the total driven, 1,996 feet were driven during the year. Some payable values have been disclosed, and there are several small blocks that could be worked out at a profit if a reduction plant were available. However, owing to the difficulties experienced in obtaining at that time a sufficient supply of native labour for the producing mines, it was considered advisable to discontinue this work. Oliphantsgeraamte, No. 459.—Towards the end of October, prospecting work was started on this farm, where the Theta reef is outcropping. A small prospecting party is at work there, but, although the reef has been located and driven upon in several places, showing some fair values, nothing of an important nature has as yet been found. 1,283 feet were driven and 171 feet sunk. The total amount expended on the prospecting works, enumerated above, was £5,020 17s. 10d., or 9.92d. per ton milled, which is all included in the working costs. Developing Operations.—Central Mines Developing operations, notwithstanding the continued scarcity of native labour, and a good deal of dead work which had to be carried out, have been fairly successful. It has been possible to develop an amount equal to the tonnage milled, and this, in spite of the fact that the tonnage milled has been increased by 19,163 tons, or 19 per cent. over the previous year. Clewer and Duke's Hill: 4,221 feet driven, 117 feet risen, 219 feet sunk; Peach Tree, 6,136 feet driven, 68 feet risen, 78 feet sunk; Columbia Hill, 4,607 feet driven, 257 feet risen, 105 feet sunk; Columbia Shales, 577 feet driven, 2,237 feet cutting and trenching; Brown's Hill, 779 feet retimbered and reopened; Theta, 7,739 feet driven, 15 feet risen, 20 feet sunk, 2,471 feet retimbered and reopened, 109 feet cutting and trenching; Graskop, 4,866 feet driven, 560 feet risen, 17 feet sunk, 279 feet retimbered and reopened. Totals: 28,146 feet driven, 847 feet risen, 439 feet sunk, 3,529 feet retimbered and reopened, 2,346 feet cutting and trenching. The total amount expended on this work in the above producing mines was £27,918 19s. 3d., equal to 4/7.17d. per ton milled, and is included in the working costs. The ore reserves have been recalculated, and they are now estimated at 319,719 stoping tons, valued at 14.22 dwts. per ton; the tonnage being practically the same as in the previous year, while there is an increase of 0.17 dwts. in average values per ton. There are small quantities of payable ore available in outside prospecting propositions, but these cannot be reckoned upon, as they could only be utilised if reduction plants were available in their immediate neighbourhood. Columbia Hill.—The connection between this mine and the Peach Tree Mine having been made during the year, it has now entered the producing stage, and is worked in conjunction with Peach Tree. Summary of Development Results:—Clewer Mine.—Of the 66,245 tons of payable ore available at 31st March, 1911, 39,933 tons have been worked out, and 23,457 tons only is the estimated tonnage on hand at the end of the year now under review. The difference of 2,855 tons represents the tonnage which it has not been possible to mine having proved unpayable on actual stoping. As the Morgenzon Concession expires on the 5th May, 1913, it has been necessary to realise, without loss of time, its ore reserves. As these are of low grade, it has been necessary to work most of the best stopes in the other mines, so that fair profits could be maintained. However, one of the blocks in Broken Hill section, which was supposed to be unpayable, and difficult to work owing to water, has recently disclosed a reef of fair thickness and value, which is now being developed and stoped out as fast as possible, and it is expected that all the payable reef, which may be disclosed in the block, will be extracted during this year. This mine has been the largest contributor to the mill while the grade of its ore has been the lowest. The Duke's Hill Channel, which is worked as a section of the Clewer Mine, has, during the year, disclosed the best development and shown, to a gratifying extent, the continuation of its channel; had it not been for difficulties of ventilation and a downthrow lowering the lode, it would have been possible to have developed a still larger tonnage. This section, being accessible from the Clewer Mine only, a new adit has been started from Duke's Hill South in Ponieskrantz, so as to connect with this part of the mine, reduce the length of tramming and promote ventilation. The total length of this adit, which is nearly completed, is about 600 feet and the connection will soon be made. It is perhaps well to mention here that two other adits are being put in between this and Columbia Hill, so that the advancement of the development from the Duke's Hill Channel will be facilitated. Peach Tree.—The development of this mine during the year proved rather disappointing, and although a large amount of drivage has been accomplished, the payable tonnage disclosed is comparatively small. A great amount of dead work had to be done, in order to develop the ground on the east side of the Beta Dyke which is intersecting this mine. The development towards the dip has not as yet disclosed anything of an encouraging nature. A large amount of good ore has been stoped from this mine in order to average the grade drawn from the Clewer, thus accounting for a large drop in the value of its ore reserves. Theta.—Development work has been carried out mostly on the north section of the hill, but, owing to the extremely broken nature of the ground, although encouraging indications have been found, nothing of importance has as yet been disclosed. As this section of the hill is the only portion which remains to be exploited in order to provide new development, it became necessary to start prospecting work on the remaining portion of the reef-bearing area which extends to the east. Four drives have been started in this section (which is now called Theta Extension), but sufficient work has not been done as yet to prove the ground. It is pleasing to be able to place on record that the old South Section, which has yielded the best ore right throughout the life of the mine, is still opening up good payable blocks in an upper reef, the existence of which was unsuspected. All indications point to the extension of this reef over a considerable area. Graskop.—The development of this comparatively new mine has been fair, and its available ore reserves show an increase over the previous year's estimate. Stoping was done exclusively in the top section of the mine above the tramline, and arrangements are now being made to connect the lower section, so that in future this portion of the mine will also contribute to the mill. Mining operations.—The detailed tonnages mined are as follows:—Clewer and Duke's Hill, 42,881 tons, £20,281 1s. 10d, 9/5.51 per ton mined; Peach Tree and Columbia Hill, 39,928 tons, £18,926 18s. 6d., 9/5.77 per ton mined; Theta, 17,137 tons, £9,277 17s. 8d., 10/7.69 per ton mined; Graskop, 21,212 tons, £8,255 12s. 5d., 7/9.07 per ton mined. Totals: 121,458 tons, £56,711 10s. 5d. cost, 9/4.06 per ton mined. The above figures represent, for all practical purposes, the tonnages trammed from the various mines. Actually 121,510 tons have been trammed, at a total cost of £8,013 10s. 9d., or 1/3.84d. per ton milled. Milling operations.—The various mines contributed to the mill, ore in the following proportions:—Clewer, 35 per cent.; Peach Tree and Columbia Hill, 33 per cent.; Theta, 14.5 per cent.; Graskop, 17.5 per cent. Total, 100 per cent. The 60-stamp mill at the Central works gave the following results:—Average number of stamps at work, 60; running time (days), 335.152; ore crushed, 121,450; duty per stamp per day, 6.639; average milling costs, 1/9.26. Tube mills ran as follows:—Average at work, 1.591; running time (days), 327.501; average cost, 1.590d.; total fine gold recovered from mills, 40,351.155 ozs.; total value, £168,396 9s. 5d.; value per ton milled, 27/8.77. During the year a third tube mill has been added to the plant, thus allowing for a finer product, better extraction, and lower residues being obtained. A complete rearrangement of the driving equipment for the three tube mills now available has also been installed. A compressor plant is being erected and is now nearing completion at the Peach Tree Mine, which will allow of a greater speed in driving, and also of larger blocks being developed than hitherto. The difficulty of ventilation—which has up to now restricted the size of the blocks—will be done away with by the introduction of machine drilling by compressed air. An addition of five new tanks with a new pump-house is being erected at the Cyanide Works; but this means it will be possible to obtain better treatment of the larger amount of slimes, which the introduction of the third tube mill will produce. It will also be possible to handle a certain amount of accumulated slimes now lying at the Clewer Mine. Crushing station extension: The larger tonnage to be treated, which the erection of the third tube mill and the extension of the slimes plant will allow, has necessitated the extension of the crushing arrangements. This is now in course of erection, and, when completed, it will be possible to crush separately the ore from the different mines, allowing of their being milled separately, thus recording in a satisfactory manner their individual grade. Mill plate water pump.—Owing to the small amount of water obtainable at times from the present water race from the Pilgrim's Creek, a new pumping arrangement from the Blyde has been installed, which will allow for an adequate supply for all reduction purposes right through the year. Electrification of Jubilee Tramline.—This line, which up to now has been worked by mules, has been electrified during the year and more satisfactry and economical working will now obtain. A new Reverberatory furnace has been erected, and is working very satisfactorily, the arrangement for the smelting of gold from the cyanide process being obsolete and unecomonical. A new Assay Office, with Rival furnace, has also been erected, with adequate crushing and drying plant; while adjacent to the same building a new retorting and smelting room for mill gold, has also been added. These erections were absolutely necessary owing to the unsatisfactory working of the old plant. Married Quarters.—During the year two semi-detached cottages have been built near the central works—thus improving somewhat the accommodation for the Company's married employees. Belvedere Power Plant.—The erection of this important power scheme for the generation and transmission of the electrical energy obtained from Blyde, has been completed during the year, and is now working very satisfactorily. This plant is erected at a distance of twenty miles from the Central Works, where the fall of the Blyde River has been utilised to the best advantage. The danger of stoppages owing to want of power is now done away with, and, moreover, it has been possible to increase the capacity of the plants by the additions mentioned above. The plant consists of three turbines, generating 950 h.p. each, two of them to be used at a time, while the third is kept as a stand-by. Allowing for all losses in generating, transmitting and transforming, there is now ample power for all present and near future requirements, while it is hoped to dispose of the surplus power to the small mining properties along the Blyde, and in the neighbourhood of Pilgrim's Rest. This plant was completed and began working and supplying power to the Central Works on the 30th July, and to Vaalhoek Mine on the 3rd of September. The total cost of this plant was £71,975, of which £25,500 were expended during the year. Native Labour.—Great efforts have been made to improve the supply of native labour by judiciously increasing the rate of pay, and to a large extent, by improving the rations and living conditions generally. Considering the great scarcity of this most important class of labour all over the Union, the efforts made have met with fair success. The number employed average 1,817—an increase of 71, or 4 per cent. over the previous year. As the future success of your Company's operations depends, almost entirely, on an adequate supply of unskilled labour, it is hoped that the unsatisfactory conditions now prevailing will soon improve. General.—The working profit at the Central Mines shows a decrease of 6/8.59d. per ton compared with the previous financial year. This was due to the necessity of milling as speedily as possible the low grade ore in the Clewer Mine. Owing to the material increase in the tonnage treated, however, the actual decrease in profits only amounted to £5,677 15s. 11d. This decrease was more than counterbalanced by the improved profits at Elandsdrift and Vaalhoek so that the Company's working profit shows an increase of £2,608 17s. 2d. for the year. It is a matter for congratulation that, notwithstanding the very dry season—the worst on record—owing to the Belvedere power scheme operating, it has been possible to run practically all the plant throughout the year. The rate of progress in the construction of the railway has been slow, and the line is not expected to reach Sabie for another year. Elandsdrift Mine.—In submitting herewith the resident manager's yearly report on Elandsdrift Mine. I have pleasure in placing on record the highest profit ever made by this unit, which amounted to £29,481 14s. 8d., or 71/4.35 per ton milled. It is also gratifying to note an increase in the ore reserves. A sum of £329 16s. 8d. has been expended on capital account, and you have authorised the expenditure of £5,518, for the erection of a hydro electric power plant. The only available water right has been secured, and, although the estimated power to be generated is too small for the probable future requirements, it is, nevertheless, sufficient for the electrification of the plant and for pumping the dip section, the development of which has been, so far, impeded by water. It will then be possible to test the payability of the Mynpacht. During the first five months of the year, Mr. Patrick being on leave of absence, the management was undertaken by Mr. Laroque from the Vaalhoek Mine. In conclusion it is a matter for congratulation that this mine should have turned out so profitably and have prospects so promising, and I have pleasure in placing on record the very good work done by the management during the year. Vaalhoek Mine. The resident manager's report on the year's operations at Vaalhoek Mine contains the details as to developments, ore reserves, and reduction operations, together with the revenue and expenditure. It is disappointing that, although a large amount of drivage was done, little of importance has been developed during the year. The Hill Section being practically wholly developed, attention has been given to the River Section and to the Dyke Section, but, so far, results cannot be considered of an encouraging nature. The profit made has been small, amounting to 7/1.05d. per ton milled only, and, moreover, there is a decrease of 3,898 tons in the ore reserves. However, every effort is being made and constant attention is devoted to this mine with the endeavour of ascertaining the extension of the Glynn's Reef, and to prospect and open up the large ore body of stockwork on the Dyke, which, although mainly composed of low grade and refractory ore, has sometimes disclosed rich patches of cupreous ore carrying good gold values. Mr. Laroque, in the earlier part of the year, acted as manager at Elandsdrift, and, on Mr. Patrick's return, left the service of the Company to proceed to Europe. Mr. P. H. Ironside acted as manager during the greater part of the year, and, in the month of March, the services of Mr. G. Carter having been secured for this proposition, Mr. Ironside resumed his work at the Central Mines.

Transvaal G.M. Estates: A Quarter's Results.

The directors' report for the quarter ending 31st March, 1912, states:—Central Mines: Number of feet driven, sunk and risen, 6,723; ore mined, 32,150 tons; ore crushed, 31,900 tons; number of days (24 hours) working an average of 60 stamps, 81.133 days: crushing duty per stamp per 24 hours, 6.553 tons; yield in fine gold, 11,721.198 ozs.; yield per ton in fine gold, 7.348 dwts. In the cyanide works, sands treated were 12,601 tons; slimes, 18,224 tons: total, 30,825 tons; sands yielding 4,405.985 fine ozs.; slimes, 4,660.728 fine ozs.; total, 9,066.712 fine ozs.; yield per ton treated, sands, 6.993 dwts.: slimes, 5.114 dwts.; total, 5.882 dwts. Elandsdrift Mine: Number of feet driven, sunk, and risen, 108; ore mined, 2,072 tons; or crushed, 1,893 tons; number of days (24 hours) working an average of 5 stamps, 81.688 days; crushing duty per stamp per 24 hours, 4.634 tons; yield in fine gold, 2,566.939 ozs.: yield per ton in fine gold, 27.120 dwts. In cyanide, sands treated, 1,955 tons; yielding 300.334 fine ozs., or 3.072 dwts. per ton treated. Vaalhoek Mine: Number of feet driven, sunk, and risen, 467; ore mined, 3,504 tons; ore crushed, 3,581 tons; number of days (24 hours) working an average of 10 stamps, 81.457; crushing duty per stamp per 24 hours, 4.396 tons; yield in fine gold, 554.971 ozs.; yield per ton in fine gold, 3.099 dwts. In cyanide, sands treated, 3,542 tons; yield, 669.137 fine ozs.; yield per ton treated, 3.778 dwts. On the basis of tonnage milled, the mill yielded 14,843.108 fine ozs. or 7.943 dwt. per ton, and 59.660 per cent. of total yield; in the cyanide works, sands yielded 5,375.456 fine ozs., or 2.876 dwts. per ton, and 21.606 per cent. of total yield; slimes yielded 4,660.728 fine ozs., or 2.494 dwts. per ton, and 18.733 per cent. of total yield; total for cyanide works, 10,036.184 fine ozs., or 5.370 dwts. per ton, and 40.339 per cent. of total yield. Grand total, 24,879.292 fine ozs., or 13.313 dwts. per ton. Central Mines.—Total cost, £39,881 12s. 1d., cost per ton milled £1 5s. 0.049d. Working profit for the quarter carried down, £47,234 5s. 7d. equal to £1 9s. 7.367d. per ton milled. Grand total, £87,115 17s. 8d. equal to £2 14s. 7.417d. Elandsdrift Mine.—Total cost, £2,402 7s. 10d., £1 5s. 4.582d. per ton milled. Working profit for the quarter carried down, £9,628 13s. 6d., equal to £5 1s. 8.751 per ton milled. Grand total, £12,031 1s. 4d., equal to £6 7s. 1.333d. per ton milled. Vaalhoek Mine.—Total cost, £4,206 4s., £1 3s. 5.901d. per ton milled. Working profit for the quarter carried down, £952 12s. 10d., equal to 5s. 3.846d. per ton milled. Grand total, £5,158 16s. 10d., equal to £1 8s. 9.747d. per ton milled. General expenses (European and Head Office), £3,674 9s. 3d.; debenture interest, £1,550; profit for quarter, £55,690 6s. 8d.: total, £60,914 15s. 11d. By working profit for the quarter brought down, viz., Central Mines £47,234 5s. 7d., Elandsdrift Mine £9,628 13s. 6d., Vaalhoek Mine, £952 12s. 10d.—£57,815 11s. 11d.: sundry revenue, £2,020 15s. 4d.; interest, £1,078 8s. 8d.: total, £60,914 15s. 11d. Note.—The estimated amount due to the Government under the Mining Taxation Act of 1910, is £4,268 3s. Capital expenditure for the quarter has amounted to £10,813 17s. 2d., made up as follows: Central Mines, £7,627 16s. 9d., Elandsdrift Mine, £3 7s. 6d. Belvedere Power Station, £2,648 6s. 8d.: wattle plantations, £534 6s. 3d. In deference to the wishes expressed by shareholders and others, it was decided to discontinue the carrying of reserve gold, and the amount in reserve at the end of February was declared with the results for March as a special item. In future the actual results will be declared and shareholders must realise that variations in the amount of profit may occur from month to month. Any circumstances entailing abnormal results will be explained when the monthly profits are declared. Extraordinary expenditure in connection with timber supplies was met out of working expenses for the month of March, which were increased by about £2,000. On the other hand the profit earned, apart from the inclusion in the output of reserve gold, was exceptionally high owing to the fact that the ore stoped in Columbia Hill Mine was of abnormally high grade.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Scientific Feeding of Mine Boys.

To the Editor, *South African Mining Journal.*

Sir,—I have read with considerable interest the article appearing in your issue of the 25th ult., with regard to the above matter. As one with considerable experience of underground natives, I think the idea set forth is an excellent one, not alone from the fact of the saving of wastage, portability, and the guaranteed uniformity of the ration, both in weight and quality, but from the more important factor affecting the whole of the mining industry, the increased efficiency to be obtained by such a diet, which must make for better labour results from a physical point of view. A ration which has met with the Imperial Government's support as the best of its kind for issue to the troops under the arduous duty of active service on the field must, in my opinion, also make for an increased efficiency in an underground labourer, who not only requires his stomach filled, but requires a diet easily digested and made of the best ingredients from a physical labour standard. The bread ration does not, in my opinion contain these valuable attributes. You do not mention Messrs. Spratt's South African representative's name and address, and I should be glad to have these particulars to enable me to go more fully into the matter.—I am, etc.,

ENGINEER.

East Rand, 1st June, 1912.

[The representative of Spratt's in Johannesburg is Mr. Butterworth, of Exploration Buildings.—Ed., *S.A.M.J.*]

The Land Companies and the Prospector.

To the Editor, *South African Mining Journal.*

Sir,—One often hears it complained of that the large land-owning companies and corporations of the Transvaal have locked up the best parts of the country and securely bolted the door against the prospector and small capitalist. To this the land companies offer the rejoinder that they keenly desire to have their properties exploited, and to this end have sought the assistance of prospectors to whom they have offered liberal terms, framed laws for the governance of prospecting contracts and backed up their proposals by generous awards in the event of payable mines being discovered. This all looks very well on paper; the magnanimity of the land corporations is superb. But if you look into these agreements closely you will find that it is in nearly every instance a case of " heads I win, tails you lose." The prospector has to carry out a large amount of work; he has to sink labour and money in no unstinted sums, and if he fails, the land company, which has not risked one cent, pats him on the back and tells him to try elsewhere. Should he discover any minerals, he has to prove a payable mine, and should he achieve this, the land company gives him a paltry reward and proceeds to reap a fortune out of the prospector's discovery. Should the prospector fail in establishing the payability of the occurrence through lack of further capital, the land company reaps the benefit of his prospecting and development operations. Can one be surprised that the land corporations have never been overwhelmed with responses to their prospecting proposals? A man may go to Rhodesia or Portuguese East Africa, comply with far less exacting regulations, and obtain the full benefit of his reward should he discover anything. And after all the number of good things that have been found in the outlying districts during the last six years has been very small indeed. Still I believe the Transvaal, apart from and altogether outside of the Rand, Lydenburg, the Premier-mine, and the tin fields around Potgietersrust, is a wonderfully mineralised country, and I am confident that if the land corporations were really desirous of having their farms prospected they could devise agreements and terms which would attract good men instead of driving them to neighbouring States. The view that the " big houses " have purposely set hindrances to the opening up of the outlying districts in order that all capital shall flow to the Rand, and the Rand only, has often been ridiculed, yet, judging from the action of the land-locking corporations, the idea is far from being so ridiculous as many people would have us believe.—Yours, etc.,

" PROSPECTOR."

Pretoria, June 10.

White Men for Coal Mines.

To the Editor, *South African Mining Journal.*

Sir,—Mining men all over the Rand are at present very interested in the new " Miners' Phthisis Bill," which will probably become law very shortly. The reports we have received of it make us think deeply, as it will press very heavily on the old miners of these fields. As far as we can gather, the " Miners' Phthisis Bill " doles out a small sum to each miner, who has been touched by this dread disease. This sum being inadequate to live on in this country, it means that most of our best men must, of necessity, quit it. Now, sir, I would like to make a suggestion to try to keep our mining community together—make our coal mines white men's mines! This is rather a startling proposition, but it can be done. It is a well-known fact that coal dust, far from causing, prevents consumption; so it is safe to assume that coal-mining would aid, in a measure, to restore the health of those gold miners, who would be cast off under this new Act. The employment of these men would release a large number of Kaffirs for service in the gold mines; and the collieries would thus form a grand training school, under practical miners, for the youth of this country who desire to take up mining. Their present cry that mining is unhealthy would not then apply. Granted that the price of coal would increase, would it not be an equitable tax on the whole community? This, and the fact that the Transvaal must eventually become a great coal-mining district, leads me to think that a solution of some of our difficulties might lie in the direction of *white men for the coal mines.*—I am, etc.,

" MINE CAPTAIN."

Benoni, June 11th.

Industrial Application of Aluminium.

To the Editor, *South African Mining Journal.*

Sir,—An article in your issue of April 13th has come to my notice, which was written by Prof. Gaston Jacquier with reference to his aluminium alloy named " Argilite." Having established the fact that aluminium was the only inexpensive metal that has some of the requisite properties for resisting the attack of the numerous chemicals he refers to, he points out that this metal in the pure state has great defects, being friable, soft, and with no power of resistance to pressure. These latter remarks, of course, apply almost entirely to cast aluminium, and Prof. Jacquier appears to have overlooked the fact that pipes and pipe lines can be quite as readily made with solid drawn aluminium tubes, which, compared with cast tubes, show economy both in weight and cost price; moreover, they are not brittle and far from being porous. Many such pipe lines are in use in this country in chemical works, where the resistive properties of the metal allow of its application, the connections between the various units being made by means of flanges autogeneously welded to the pipes. Again, as an instance of the non-porous nature, and of the resistance to pressure, of worked aluminium, I may say that there are several tanks both for pressure and vacuum in use, made by the above process of welding, of varied capacities, up to and over 2,500 gallons, and tested to 50 lbs. per square inch. Aluminium vessels are now coming into use in large numbers in the chemical industry, in spite of the price which Prof. Jacquier states is maintained by Trusts. His cost price at the factory of £20 per ton is totally inaccurate, being less than half the actual cost of the metal as made by the Hall and Heroult process, which is used in all aluminium factories of the world, whereas the market price of £54 per ton was that one, wholly uninfluenced by Trusts, which, since their re-establishment, has resulted in an increase of price to the present one of £69 per ton, which only allows a reasonable margin of profit to the manufacturers.—I am, etc.,

A. VIVIAN HUSSEY,

Chief Chemist to the Aluminium Corporation, Ltd.
Dolgarrog Works, Tal-y-Cafn, North Wales,

Scrap Iron Contract.

To the Editor, *South African Mining Journal.*

Sir,—The report of the Select Committee on the scrap iron agreement is interesting reading, not only to the general public, but especially to those who know something more about this business than has been brought to light by the Select Committee, and it is more than probable that those connected with the "British Colonial Metals Syndicate, Ltd.," of which the writer was a member, were responsible for the original initiation of this project, as the following brief statement of this syndicate's operations will show. Early in the year 1908 Mr. H. H. Johnson, at that time Manager of the Village Deep, together with myself and others, opened up negotiations with the Municipality of Pretoria, with the object of acquiring land, whereon to erect the necessary buildings and works for the purpose of treating the iron ores which abound on the Pretoria commonage. After somewhat lengthy negotiations a basis of agreement was arrived at and a provisional contract was adopted, satisfactory to both parties. In the meanwhile the necessary financial backing was secured in England, Sir James Sievewright and other influential capitalists, including several leading men in the iron business, agreeing to put up £300,000 for the purpose of establishing smelting works in Pretoria, provided the Government was prepared to offer fair inducements in support of the industry, such as other colonies had done. For the purpose of thoroughly investigating the possibilities of such an industry, the services of a specialist were requisitioned by the Government, and Mr. F. W. Harbord was entrusted with the job. After an examination of the many ore deposits and going thoroughly into the economics of the question, he recommended the Government to call for tenders for the scrap steel and iron which had accumulated at the railway and other works, but making it a *sine qua non* that tenderers were to "carry out experimental work in the smelting of iron ores to the satisfaction of the Government." (*Vide* Appendix A, Report of Special Committee.) The tender price was fixed by the Government at 20s. per ton, and the quantity was to be 15,000 tons, plus 500 tons per annum for five years. According to the evidence of Mr. H. Warington Smyth, Secretary of Mines, four tenders were sent in which were dealt with as follows:—(1) Mr. Scott Anderson; ruled out at once, as the State mining engineer was of opinion that the proposal was not a good business one, and that he (the tenderer) really wished to sell an experimental electrical furnace. (2) The British Colonial Metals, Sir James Sievewright and others; was ruled out, because their policy was exactly contrary to that recommended by Mr. Harbord. He recommended that the smelting of ores should be subsidiary to the dealing with scrap. Mr. Smyth adds "that the smelting of ores will not pay at this stage—the scrap must be made the industry." and further on he adds the policy of the British Colonial Metals was "to deal with the low grade ores and only to buy scrap as a secondary assistance to this main policy." (3) Mr. Wright's tender was ruled out, apparently because he had forfeited his discoverer's rights in certain Crown lands, and finally the contract was signed in favour of Messrs. Walker and Campbell, who held the patent rights for South Africa of the Heroult electric furnace, and professed to be able to deal with titanium-iron ores of the Transvaal, but later on this contract was cancelled, because the tenderers did not find the necessary security, and when finally General Smuts gave instructions to break off negotiations, a contract was entered into with the present company, consisting of Mr. H. Wright, whose tender had previously been rejected, Mr. Senator Marks and others, and known as the South African Steel Corporation. In this contract the time has been extended for 16 years in place of the five under which the tenders were called for, and certain other privileges are granted, and the clause in the Government call for tenders has been altered from "the successful applicant will be required to carry out experimental work in the smelting of iron ores to the satisfaction of the Government" to "the treatment of local iron-ores so far as may be commercially feasible,"—and in the thirteenth clause of the agreement it is stated "that the company shall not be obliged to carry on any such experiments if, on reference to an independent authority, (a) the finances of the company do not warrant the expenditure requisite for such experiments; or (b) that the smelting of local iron ores by recognised processes then existing and being worked by iron and steel manufacturers, cannot be profitably worked on a commercial basis within the Union."

Now, sir, I wish to call your attention to certain facts which any one perusing the report of the Select Committee cannot help noticing. Firstly, the British Colonial Metals entered into negotiations with the Government, with the object of erecting a plant for the treatment of local iron ores, long before the idea of dealing with Government scrap was mooted by Mr. Harbord. The latter gentleman only arrived in South Africa on the 16th November, 1909, and issued his report the following February, and negotiations with the Government were commenced by the British Colonial Metals in the early part of 1908. Consequently there was no intention on the part of its promoters to deal with anything but the local ores, and I believe I am correct in stating that had this company not initiated proceedings, the Government would not have requisitioned the services of Mr. Harbord. Mr. Warington Smyth admits in his evidence that "Sir James Sievewright's people had entered into an agreement with the Municipality of Pretoria, and had been in negotiation in regard to the working of low grade ores, and my department had been connected with the discussion for some months previously" to Mr. Harbord's recommendation. Secondly, that there is no reference to any special furnace or process in the original call for tenders by the Government, yet the contract was first granted to Messrs. Walker and Campbell because "they were well supported and they were the holders of the patent rights for South Africa of the Heroult electric furnace, which it is asserted has been worked with commercial success." Yet this firm did not find the necessary security of £3,000, but offered £1,000, and the present contractors are allowed to use any furnace they please. Thirdly, as the price of the scrap was fixed by the Government at 20s., where did the necessity of calling for tenders come in at all, except that the Government intended to compel the successful tenderer to carry out certain experimental work with the object of establishing a permanent industry to deal with local iron ores in this country. If the Government only intended to establish a scrap iron industry, as it now appears to have done, the local scrap foundries could have dealt with all the Government heaps, and they would most likely have given a higher price than 20s. per ton, more especially if they had been granted the privileges given to the South African Iron and Steel Corporation, Ltd. To the ordinary mortal it must seem strange that the tender of the British Colonial Metals should have been simply "ruled out" because they had considered the erection of furnaces to deal with the local iron ores, of infinitely more importance than the handling of a few paltry heaps of scrap iron, scarcely sufficient to keep a decent works going for six months. The British Colonial Metals was backed by wealthy men, who were interested in the development of South Africa; the company was prepared to establish a sound industry, with the most modern processes and the best furnaces obtainable; it was prepared to put down the security demanded by the Government, and in proof of its intentions a site had been selected in the capital city and a contract with the Municipality only awaited the acceptance of its tender for confirmation; yet this company is not only "ruled out" in favour of some unknown people in England who are unable to find the necessary security, and whose only plea was that they held the right to use the Heroult furnace in South Africa. The State Mining Engineer, Mr. R. N. Kotze, in his final memorandum to the Secretary of State, is responsible for the following statement. Clause 4, page xi., Appendix to Report on Scrap Iron Agreement. "The three other applications (after ruling out Mr. Scott Anderson's tender) are in accordance with the terms of the Government notice. As far as arrangements for capital are concerned, the proposals of each of these three firms may be considered sufficiently satisfactory, subject to such further adjustment as may be made in the final agreement." So evidently the State Mining Engineer did not consider the tender of the British Colonial Metals invalid for the reason stated by Mr. Warington Smyth. I believe all right-thinking men will agree with me that the British Colonial Metals should have been given a chance to alter their tender, as they had only technically made an error in their application, an error which was all in favour of the establishment of a steel and iron works in this country, to deal with local ores.—I am, etc.,

DAVID DRAPER.

[In view of this letter and other requests that have been addressed to us on the subject, it would be well if the Government would publish all the reports on the matter, notably that of the Government Inspector of Machinery.—Ed. *S.A.M.J.*

Far East Rand Geology.

To the Editor, *South African Mining Journal.*

Sir,—In drawing attention to the "Promise of the Far East Rand," in your last issue, it may be interesting to your readers to learn, from one who knows, that none of the gold mining companies mentioned in your list are working on Main Reef series—as is generally supposed—and that the "Cinderella" of these fields, viz., Black Reef series, is responsible for £240,783 worth of the gold, out of your total of £364,299, credited to that area in April. Government Areas has struck Black Reef and its adjuncts, such as the Leader, etc., again, and again, and again, in all its four shafts; although, be it said, Main Reef series underlies it, and its shale foot, at depth—as it is distinctly outcropping in the northern portion of the property, dipping "daar onder," as they say in Dutch. Add to the above figures the returns from the whole of the West Rand for the same month, and it will give the public some idea of what is in store for our "Cinderella" when she outputs from all over the 4,000 square miles, or more, known of as her's. Then we shall have Chinese, Japanese, Siamese, and the rest, if you please, flocking here by sea and air, without leave. If a tenth only of the possibilities which I can see ahead for this catholic series could only be reached in my time, I would have the satisfaction of teaching my geological friends something re the "local enrichment" of their hobby-horse, Main Reef, and the assumed contempt they have for it, and all series other than their everlasting Main Reef, which takes pride of place on paper only. Black Reef age is Nature's last auriferous offspring. The schistose came first, then Lydenburg, and next the Witwatersrand age. Hence, according to the fairy tale, that "the last shall be first," our Cinderella stands a good chance of putting the noses of her sisters out of joint before she is much older.—I am, etc.,

SCOTT ALEXANDER.
"Rand Stratigraphist."

Johannesburg, June 10th, 1912.

New Eland Diamonds.

The following are washing results for May: Number of net loads of 16 cubic feet, 7,983; diamonds found, 1,305 carats; percentage, 16·34

Wolhuter Gold Mines.

The report for the quarter ended 30th April, 1912 states:—Profit for quarter, £45,126 3s., 10s. 6.598d. per ton. The capital expenditure was as follows:—Shafts, £298 10s. 8d.; buildings, machinery and plant, etc., £636 16s. 2d. Total, £935 6s. 10d. Note.—No allowance has been made in the above statement for the Government tax on profits. Reserve gold carried forward to 1st May, 1912, 2,618.227 fine ounces. On 12th April, 1912, Dividend No. 9 of 8¾ per cent. (1s. 9d. per share) was declared for the six months ended 30th April, 1912, payable to shareholders registered on 30th April, 1912. Ore mined from each Reef:—Deep Level: 12.721 Main Reef, 12.146 Main Reef Leader, 16.147 South Reef; total, 41,014 tons. East Incline: 365 Main Reef, 26,885 Main Reef Leader, 13.177 South Reef: total, 40,427 tons. Mynpacht: 953 Pyritic Lode, 2.684 Main Reef, 4.675 Main Reef Leader, 6.872 South Reef: total, 15.184 tons. Totals: 953 Pyritic Lode, 15.770 Main Reef, 43,706 Main Reef Leader, 36,196 South Reef—96,625 tons. Approximate tonnage sent to the crusher house, 96.625 tons; waste sorted out (10.944 per cent.), 10,575 tons—86,050 tons; in mill ore bins 1st February, 1912, 100 tons—86,150 tons; tons milled, 85,550 tons; in mill ore bins, 1st May, 1912, 600 tons. Milling—Number of stamps running, 120; total time run, 81.672 days; tons milled, 85,550; duty per stamp per day, 8.729 tons; amalgam recovered, 63,667.5 ozs.; assay value of ore milled, 7.047 dwts.; yield in fine gold, 19,578.159 ozs.; yield per ton milled in fine gold, 4.577 dwts. Cyaniding sands.—Tonnage treated, 51,700 tons; assay value of sand treated 3.058 dwts.; yield in fine gold, 6,678.491 ozs.; yield per ton treated in fine gold, 2.584 dwts.; yield per ton milled in fine gold, 1.561 dwts. Cyaniding slimes.—Tonnage treated, 33,850 tons; assay value of slimes treated, 1.613 dwts; yield in fine gold, 2,370.000 ozs.; yield per ton treated in fine gold, 1.400 dwts.; yield per ton milled in fine gold, .554 dwts. Recovered from all sources: 28,626.650 ozs, equals 6.692 dwts. fine gold per ton milled. The payable tonnage developed during the quarter amounts to 86,279 tons, valued at 6.32 dwts. over 52.9 ins. stoping width. Deep Level Section.—In this section the development values show a slight improvement on those of last quarter, 1.087 feet having been sampled, averaging 5.3 dwts. over 50.7 ins. 10th Level.—A winze has been started on this level 30 feet from the Goch boundary, to connect with 13th Level, the values averaging 7.6 dwts. over 40in. for 35 feet sampled. 15th Level.—Raise 1 west in east, Main Reef, shows an average of 6.2 dwts. over 40 ins. 17th Level.—Drive East, Main Reef Leader, maintains a good average, being 8.2 dwts. over 46 ins. for 85 feet sampled. Drive 2a, South Reef, being 10.5 dwts. over 50 ins. 18th Level.—Drive East, South Reef, shows better value, being 4.5 dwts. over 63 ins. for 105 feet, while the "Face" value shows 10.5 dwts. over 60 ins. 20th Level.—Drive East, South Reef, shows much lower values than for last quarter, being 4.7 dwts. over 54 ins., against 9.4 dwts. over 43 ins. The values for Drives East and West, Main Reef, continue poor, the latter being in faulty country. East Incline Section.—In this section good values are being maintained, although slightly lower than for last quarter, 723 feet have been sampled, averaging 7.7 dwts. over 46.7 ins. 15th Level.—The Main Reef Leader Drive has been restarted, showing a value of 5.7 dwts. over 40 ins. for 45 feet sampled. A raise has been started on this reef, but the values are poor, being 3.1 dwts. over 40 ins. for 35 feet sampled. 16th Level.—Drive West, Main Reef Leader, 6.5 dwts. over 43 ins. for 85 feet driven. A vertical raise was put up on the north side of the big longitudinal fault, which intersected 112 ins. of pyritic bands averaging 3.3 dwts.; these bands are separated from the Main Reef Leader above it by 6 feet of waste; 13 feet of raising has been done on the Main Reef Leader, averaging 3.3 dwts. over 36 ins. 17th Level.—Driving West on Pyritic Bands the average values are lower than for last quarter, being 7.3 dwts. over 51 ins. for 60 feet driven. The South Reef has reached the boundary after 10 feet of driving, and gives an average value of 4.4 dwts. over 40 ins. 19th Level.—On Main Reef Leader, Drive West, the values are maintained at 14.6 dwts. over 47 ins. for 55 feet where the Western Boundary is reached. The Main Reef and Leader combined average 10.1 dwts. over 87 ins. for the same distance. Winze 2 on Main Reef Leader goes 8.3 dwts. over 50 ins. for 15 feet, while the winze on South Reef remains poor at 1.4 dwts. over 40 ins. 20th Level.—Drive West, Main Reef Leader, maintains a good average, being 11.5 dwts over 43 ins., for 100 feet sampled, and combined with the Main Reef shows 7.3 dwts over 80 ins. for the same distance. A winze has been started on the Main Reef Leader, which gives an average of 10.4 dwts. over 40 ins. for 23 feet sampled. Drive East, on this Reef, also gives a good average, viz., 9.1 dwts. for 70 feet. Drive East, South Reef, shows a lower average, being 3.6 dwts. over 61 ins. for 55 feet driven. Footage developed.—Deep Level, 1,365 feet; East Incline, 870 feet; Mynpacht, 47 feet. Total, 2.282 feet. Tons developed or exposed during the quarter (includes ore mined from development).—Assumed payable tonnage.—Deep Level, 50,245 tons, assay value 5.43 dwts., over 51.0 ins: East Incline, 36,034 tons, assay value 7.57 dwts., over 55.7 ins.; Mynpacht, nil. Total, 86.279 tons, assay value 6.32 dwts. over 52.9 ins. Assumed unpayable tonnage—Deep Level, 1.070 tons, assay value 3.2 dwts., over 58.0 ins. The payable ore reserves at date are:—754.451 tons, valued at 6.39 dwts. over 51.6 ins; partially developed, 23.215 tons, valued at 6.67 dwts. over 49.2 ins. Totals, 777.666 tons, valued at 6.40 dwts. over 51.5 ins. The machinery and plant continue in good working order.

THE MAY OUTPUT IN DETAIL.

Another Record Declaration—Rand's Highest Yield—Increased Profits—Better Labour Supply.

The gold output for the Transvaal was declared by the Chamber of Mines, this week, at 779,662 ozs. of fine gold, of the value of £3,311,794, a record for a month's yield. The increase over April is 42,001 ozs., value £178,411, but as May contains one working day more in the month than April, and the average yield for April from the Rand was £100,000, the advance, though highly satisfactory, is not quite so great as would appear at first sight. The previous best declaration, £3,528,688, was made in March, but included therein was reserve gold to the value of £297,946, which left an actual output of £3,230,742, which is £81,052 less than the actual ouput for May. The Rand proportion of the total is 746,948 ozs., value £3,172,833, an increase of 40,185 ozs., value £170,693, and the outside districts return 32,714 ozs., value £138,961, which is 1,817 ozs., value £7,718, better than the April month. The aggregate returns show that the May yield was therefore, making allowance for the extra day, about £70,000 better than April, and a scrutiny of the individual returns discloses that on the whole it was very evenly distributed, the great producing companies being responsible for more than their proportion. Average daily production makes a substantial increase, and there is an advance in the average daily profit, which is higher than anything yet recorded and in the aggregate as well. No doubt the effects of the increased labour supply which went on for five months is being reflected in the returns. The average daily yield for the Rand, it will be seen from the tabulation subjoined, is the highest yet recorded. The following are the leading figures:—

Total output	779,662 ozs.
Value	£3,311,794
Increase	42,001 ozs.
Value	£178,411
Rand output	746,948 ozs.
Value	£3,172,833
Increase	40,185 ozs.
Value	£170,693
Outside districts	32,714 ozs.
Value	£138,961
Increase	1,817 ozs.
Value	£7,718
Total stamps	10,073
Increase	82
Rand	9,480
Increase	64
Outside	593
Increase	18
Tube mills	266

LABOUR.

There is a decrease of 3,259 according to the W.N.L.A. figures compared with April, on the total employed on gold, coal and diamond mines. There is a decrease on gold mines of 4,108 and an increase in coal mines of 96, while diamond mines increased their complement by 753. The figures for the past three months of the number employed by members of the W.N.L.A. at the end of each month read:—Gold: March, 196 748; April 197 937; May, 193,892. Coal: March, 8 198; April, 8,364; May, 8 460. Diamonds: March, 12 071; April, 13 785; May, 14 538. Totals: March, 217,017; April, 220,086; May, 216,827.

STAMPS.

The stamp position shows an increase on the Rand, and an increase outside. The Rand increase is due to several mines being able to put more stamps in commission, while the reductions are due to Benoni and Midas Deep falling out. The details of changes are as follows:—Rand: Increases—Aurora West, 9; Bantjes, 10; Brakpan Mines, 15; Con. Main Reef, 20; Jumpers, 5; Main Reef West, 20; Princess, 10; Robinson Deep, 20; Roodepoort U.M.R., 5; Simmer Deep, 5; Vogelstruis Estate, 9; total, 124. Decreases—Benoni, 45; Midas Deep, 15; total 60. Increase, 64. Outside: Increases—Sheba, 5; Miscellaneous, 13; total, 18. Total increase, 82. There were 258 tube mills in operation on the Rand and 8 on outside mines.

TWELVE LEADING COMPANIES.

The following are the details of production:—

	Stamps.	Tube Mills.	Tons Crushed.	Value.
East Rand Proprietary ...	820	25	162,900	275,295
Crown Mines	660	22	163,400	262,726
Randfontein Central ...	700	29	210,138	260,985
Robinson	250	6	50,100	104,549
Rose Deep	300	7	65,300	97,426
New Modderfontein	180	7	47,850	94,593
Simmer and Jack	320	7	79,700	92,384
Geldenhuis Deep	300	7	57,200	91,624
Brakpan Mines	130	6	53,650	88,442
Nourse Mines	260	7	55,000	84,492
Village Main Reef	220	5	40,336	81,505
Robinson Deep	230	5	51,000	80,660
Totals	4,370	133	1,036,564	1,614,681

GROUP PROFITS.

The following are the profits returned for March, April and May, by the mines controlled by the different groups:—

	March.	April.	May.
Rand Mines	£267,989	£224,289	£238,284
Rand Mines-Eckstein group	373,426	225,284	243,784
Gold Fields	120,190	113,026	117,305
Farrar-Anglo-French ...	115,473	114,608	114,541
General Mining	61,777	60,494	67,968
Barnato	61,223	63,336	66,133
Neumann	52,686	55;333	57,213
Cons. Mines Selection ...	26,119	30,949	40,317
Goerz	11,231	10,649	14,255
Totals	£1,090,114	£897,968	£959,800

For the years 1909, 1910, and 1911 the group working profits are:—

	1909.	1910.	1911.	1912.
January	927,161	825,380	843,470	811,637
February	858,101	787,054	791,611	812,954
March	896,779	814,672	825,498	1,090,114
April	908,080	836,310	843,685	897,968
May	917,968	857,334	829,702	959,800
June	921,201	832,505	847,641	
July	904,475	848,767	840,471	
August	889,609	862,136	799,776	
September	874,281	850,174	817,223	
October	859,761	851,792	807,237	
November	870,882	852,637	824,483	
December	854,187	862,081	855,758	

The following returns of the May output have been filed with the Chamber of Mines. Increases and decreases compared with April are subjoined:—

	April. £	May. £	Inc. £	Dec. £
Aurora West	14,761	17,165	2.404	—
Brakpan Mines	74,098	88,442	14.344	—
Bantjes	34,445	36.497	2.052	—
Benoni	18,571	7.663	—	10,908
Cinderella	27,525	29.649	2,124	—
City and Suburban	40,497	53,700	3.203	—
Crown Mines	247,405	262,726	15,321	—
Consolidated Langlaagte ...	29.071	30.469	1,398	—
City Deep	69,200	75.919	6,751	—
Consolidated Main Reef ...	30,040	33.022	2,982	—
Durban Roodepoort	14.752	15,062	310	—
Durban Roodepoort Deep ...	37,673	38.026	353	—
East Rand Proprietary Mines	267.743	275,295	7,552	—
Ferreira	27,133	25.741	—	1,372
Ferreira Deep	78.451	80.626	2.175	—
Geldenhuis Deep	86,144	91,634	5.480	—
Geduld	18,486	19,302	816	—
Ginsberg	20,559	21,808	1.249	—

	April. £	May. £	Inc. £	Dec. £
Goch	25,847	30,167	4,320	—
Glencairn	15.644	16,626	982	—
Jumpers-cum-Treasury ...	16,999	16,664	—	335
Jupiter	40.103	44,495	4,392	—
Knights Deep	52,336	51,368	—	968
Knight Central	29,904	29,989	85	—
Langlaagte East	61.131	63,508	3,377	—
Lancaster West	20.266	25,707	5.441	—
Luipaardsvlei	15,865	15,589	—	276
May Consolidated	16.320	17.373	1,053	—
Meyer and Charlton	33,859	28,999	—	4,680
Midas Deep	616	701	85	—
Modder B.	60,734	59.485	—	1.249
Nourse Mines	83.580	84.492	642	—
New Heriot	22.109	23,588	1.479	—
New Modderfontein	87.165	94,593	7,128	—
New Kleinfontein	54.745	63.045	8.300	—
New Primrose	33.655	35,995	2.340	—
New Unified	16,625	17,021	396	—
New Rietfontein	20.155	20.835	680	—
Main Reef West	26.506	31,845	5.339	—
Princess	21.799	24,539	2.740	—
Randfontein Central	241,509	260,985	19,476	—
Rose Deep	90.893	97.426	6,533	—
Robinson Deep	80,660	79.726	—	934
Roodepoort United	29,216	33.430	4,214	—
Robinson	97,864	104,549	6,685	—
Spes Bona	5,692	6.257	565	—
Simmer Deep	39.155	44.397	5.242	—
Simmer & Jack	81,161	92.384	11,223	—
Simmer East	29,394	29,403	9	—
Van Ryn	50,200	55,862	5,662	—
West Rand Consolidated ...	36,305	97,703	1,398	—
Witwatersrand Deep	53.007	53.959	952	—
Village Main	70,321	81,505	11,184	—
Village Deep	70,886	71,362	476	—
Vogelfontein Estate	12,382	13.478	1,096	—
West Rand Consolidated ...	3,874	3,865	—	9
Witwatersrand	45,332	46.636	1,304	—
Wolhuter	40,167	41,636	1,469	—
Miscellaneous	22,055	18,914	—	3,141
Outside Districts.				
Barrett	820	1,138	318	—
Glynn's Lydenburg	7,247	7,744	497	—
Nigel	19,977	20,168	191	—
Sheba	12.624	12,679	55	—
Sheba Rosetta	1,712	731	—	981
Sub-Nigel	9,345	8,984	—	361
Transvaal G.M.E.	41.369	40,273	—	1,096
Worcester	5,773	5,666	—	107
Miscellaneous	32,376	41,578	9,202	—

OUR MONTHLY TABLE.

The following is our usual monthly table:—

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	14,072	80	4,041	17,165
Bantjes Consolidated ...	25,010	80	8,592	36,497
Benoni	—	—	1,804	7,663†
Brakpan Mines	53,650	130	20,821	88,442
City Deep	40,700	110	17,872	75,915
City and Suburban	28,050	140	12,642	53,700
Cinderella Cons.	19,566	80	6,980	29,640
Cons. Langlaagte Mines ...	21,140	140	7,173	30,469
Cons. Main Reef	23,806	120	7,774	33,022
Crown Mines	163,400	660	61,851	262,725
Durban Roodepoort	14,086	90	3,546	15,062
Durban Roodepoort Deep...	25,340	100	8,952	38,026
East Rand Proprietary ...	162,900	820	64,810	275,295
Ferreira	17,500	80	6,060	25,741
Ferreira Deep	31,460	160	18,981	80,626
Geldenhuis Deep	57,200	300	24 570	91,624
Ginsberg	14,076	80	5,134	21,808
Glencairn Main Reef ...	19,505	160	3,914	16,670
Geduld Proprietary Mines...	15,120	50	4,544	19,302
Jupiter	43,650	115	10,475	44,495
Jumpers—Treasury	8,100	80	3,923	16,004*
Knights Deep	60,330	270	12,093	51,368
Knight Central	24,850	110	7 060	29,989
Lancaster	22,700	100	6,052	25,707
Langlaagte Estate	53,905	200	14,951	63,508
Luipaards Vlei Estate ...	16,744	60	3,670	15,580
Main Reef West	19,362	100	7,497	31,845
May Consolidated	14,170	100	4,090	17,373
Meyer and Charlton	14,309	75	6,827	28,999*
Midas Deep	—	—	165	701
Modderfontein "B"	32,600	80	14,004	59,485
New Goch	28,150	120	7,102	30,167
New Heriot	12,380	70	5,553	23,588
New Kleinfontein	43,000	220	14,842	63,045
New Modderfontein	47,850	180	22,269	94,593
New Primrose	24,400	160	8,474	35,995
New Rietfontein Estate ...	14,951	120	4,905	20,835
New Unified	10,710	60	4,007	17,021
Nourse Mines	55,000	260	19,891	84,492
Princess Estate	18,900	60	5,777	24,539
Robinson	50,100	250	24,613	104,549
Robinson Deep	51,000	230	19,769	80,660*
Randfontein Central	210,138	700	61,441	200,985
Roodepoort United M.R. ...	33,437	55	7,870	33,430
Rose Deep	65,300	300	22,936	97,426
Simmer Deep	48,900	125	10,452	44,397
Simmer and Jack	79,700	320	21,749	92,384
Simmer and Jack East ...	34,200	130	6,922	29,403
Spes Bona Tribute	5,994	40	1,473	6,257
Van Ryn Gold Mines ...	39,640	125	13 151	55,862*
Village Deep	51,700	180	16 800	71,362
Village Main Reef	40 336	220	19,188	81,545
Vogelstruis Estates	11 500	75	3,173	13,478
West Rand Central	2 871	20	910	3,865
West Rand Consolidated ...	27,400	100	8 876	37,703
Witwatersrand	40,060	220	10,979	46,636
Witwatersrand Deep	38,130	245	12,703	53,959
Wolhuter	30,400	120	9,802	41,636
Miscellaneous Producers ...	—	—	—	18,914
HEIDELBERG—				
Nigel	13,200	75	4,748	20,168
Sub Nigel	4,526	30	2,115	8,894*
BARBERTON—				
Barrett	—	—	268	1,138
Sheba—Rosetta	349	20	172	731
Sheba	6,310	70	2,985	12,679
Worcester Exploration ...	5,150	40	1,334	5,666
LYDENBURG—				
Glynn's Lydenburg	3,466	20	1,823	7,744
Transvaal G. M. Estate ...	14,141	75	9,481	40,273
KLERKSDORP—				
Miscellaneous Producers ...	—	—	—	41,578

* Jumpers-cum-Treasury does not include gold, taken from reserve 25 ozs., value £106. * Meyer and Charlton does not include gold taken from reserve 334 ozs., value £1,419. *Van Ryn Gold Mines does not include gold added to reserve 230 ozs., value £977. * Robinson Deep. 1,000 ozs., value £4,247, taken from reserve and added to declared output. * Sub-Nigel, 100 ozs., value £425, taken from reserve and added to declared output. † Benoni clean up.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of May of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ...	320	7	79,700	21,749	£49,369
Robinson Deep	230	5	51,000	19,769	35,842
Knights Deep	270	6	60,330	12,093	17,499
Simmer East	130	3	34,200	6,922	3,084
Simmer Deep	125	8	49,800	10,452	3,485
Jupiter	115	7	43,650	10,475	5,801
Luipaardsvlei	60	3	16,744	3,510	1,093
Sub Nigel	30	1	4,526	2,015	1,132
Totals	1280	40	339,950	86,985	£117,305

Reserve Gold.—Simmer and Jack, 1,455 ozs.; Robinson Deep, 3,362 ozs.; Jupiter, 550 ozs.; Sub Nigel, 500 ozs.; total, 5,867 ozs.

The "total profit" shown above includes sundry revenue, viz.: Simmer and Jack, £1,500; Robinson Deep, £137; Knights Deep, £409; Simmer East, £111; Simmer Deep, £548; Jupiter, £453; Luipaardsvlei, £960 (including £123, net proceeds from 159 ozs. of gold from accumulated slimes); Sub Nigel, £268; total, £4,386.

THE WEEK IN THE SHAREMARKET.

An Improvement Follows Stagnation—Dividend Announcements Well Received—Brighter Outlook.

After some days of stagnation, the market improved towards the close of the week, and London cables came firm on Friday morning. Dividends fulfil expectations, and are likely to cause a good impression in London. The excellent speeches of Sir George Albu and Mr. R. W. Schumacher are bound to reassure shareholders on the other side, and to give a fillip to the market when they are digested. Both tin and diamond shares are participating in the improvement, and the former are expected to provide the next spurt. The Far East Rand, of course, still remains the chief centre of interest, and the latest news from the properties there fully justifies the growing optimism. The labour position will be set forth at the monthly meeting of the Chamber of Mines next week, and, with Parliament soon to cease from troubling, there is promise of a better time for the sorely-tried industry.

	*	*	*	*		
	Friday, 7th.	Sat., 8th.	Monday, 10th.	Tuesday, 11th.	Wed., 12th.	Thurs. 13th.
African Farms ...	16 6	16 3B	16 3B	16 3B	16 3B	16 0B
Adair-Usher Process	-	1 0B	1 0B	1 6S	1 6S	1 0B
Apex Mines ...	35 0	34 6B	35 0B	31 6B	...	34 0B
Bantjes Consolidated	24 3B	24 3S	24 3B	24 3B	24 0B	24 3B
Benonis	6 0B	6 1B	6 0	6 6B	6 6B	6 0B
Bushveld Tins ...	1 2B	1 4	1 4	1 3B	1 4B	1 5B
Brakpan Mines ...	78 0	77 0B	77 0B	...	78 0B	77 3B
Blaauwbosch ...	...	22 6	21 0B	21 0B	21 0B	22 0B
British S A. ...	...	...	27 0B	...	...	26 6B
Cinderella Cons. ...	...	...	22 6B	22 6B	...	22 6S
City and Suburban ...	53 3B	53 6B	53 6B	53 3B	54 0B	54 3
City Deeps	...	57 0B	57 0B	57 6B	57 0B	57 0B
Cloverfield Mines ...	...	...	6 3B	6 2	6 0B	...
Cons. Langlaagtes ...	23 0B	23 0B	23 0B	23 3B	23 6B	23 0
Cons. Main Reefs ...	19 6	19 3	19 6B	19 9	19 9	20 0
Coronation Freeholds	0 6B	0 7	0 6B	...	0 6B	0 6B
Con. Investment ...	...	21 0B	21 0B	21 0B	21 0B	21 0B
Concrete Cons. ...	...	...	...	11 0S	...	...
Clydesdales	...	10 0B	10 0B	...	10 0B	10 6B
Cons. Mine Selections	...	...	...	...	13 6B	13 0B
Crown Diamonds ...	...	...	...	5 0S	...	...
Crown Mines	...	138 9B	138 9B	137 6B	137 6B	137 6B
East Rand Cent. ...	11 3B	10 6	11 0B	11 0	10 6B	10 6B
East Rand Coals ...	2 5B	2 6	2 4B	2 4B	2 4B	2 4B
East Rand Deeps ...	2 6	2 6	...	2 4B	2 0B	2 0B
East Rand Props. ...	61 6B	61 9B	61 6	61 0	61 0	60 6B
East Rand Deb. ...	...	£93B	£94	£94½S	...	...
Eastern Gold Mines	1 9B	1 10	1 9B	1 10S	1 9B	1 9B
Frank Smith Diam...	9 3S	8 3B	8 0B	...	...	...
Govt. Areas... ...	26 3B	28 0	27 6	27 9	27 0	26 6
Glynn's Lydenburgs	25 0S	...	21 3B	21 3B	23 0B	22 6B
Geduld Props. ...	...	21 3B	...	22 6B	...	22 9B
Ginsbergs	28 0B	28 6B	...	28 0B	...	28 0B
Glencairns	4 0B	5 0S	5 0S	...	5 0S	...
Glencoe (Natal) Colls	6 0B	...	...	...	...	6 3S
Jumpers	11 0S	11 0S	...	...	10 0	...
Jupiters	12 0B	...	...	11 6B	11 0B	10 9B
Kaalfontein Diamonds	0 6	0 6	0 6B	0 6B	...	...
Klerksdorp Props. ...	3 3B	3 4B	3 4B	3 3	3 3B	3 0B
Knight Centrals ...	15 3	14 9B	14 9B	15 0B	15 0B	14 9B
Luipaardsvlei Estates	...	...	...	7 6	...	7 6B
Lace Props.	3 9B	3 9B	3 10	3 9B	3 9B	3 6B
Lydenburg Gold Farms	9 0B	9 0	9 0	9 0B	9 1B	...
Main Reef Wests ...	25 6	25 9	25 9B	25 9B	26 0B	26 3B
Modder B's	57 6B	57 6B	57 0B	57 9B	57 0B	57 0B
Midas Deeps ...	...	0 7S	0 7S	0 6S	0 6S	0 5
Middelvlei Estates...	...	1 9B	1 9B	1 9B	1 9B	1 9B
Modder Deeps ...	...	31 0B	31 0B	31 0B	31 0B	0B
Meyer & Charltons...	91 0B	91 0B	90 0B	...	91 0B	92 6B
Natal Nav. Colls. ...	...	...	...	16 0	...	...
New Eras	8 6B	...	8 0B	8 3B	8 9S	8 2B
New Kleinfonteins...	...	...	28 0B	28 6B	28 3B	28 3S
New Rietfonteins ...	8 6B	...	...	...	10 0S	8 6B
New Unifieds ...	18 3B	18 6B	17 9B	18 3B	18 0B	18 3B
New Boksburgs ...	1 9B	1 9B	1 9B	1 9B	1 11B	1 10B
Nigels	15 9B	16 0B	...	...	...	...
Orange Diamonds ...	1 4B	1 3B	1 6	1 5B	1 4B	1 6
Premiers Deferred	182 6B	182 6B	182 6B	...	...	...
Pretoria Cement Co.	57 0S	55 0B	55 0	56 0B	55 6B	57 0B
Paardekraal Estates	0 9B	...	0 9B	1 0S	1 0S	...
Potchefstroom Est....	...	...	...	1 0B	1 6B	...
Princess	10 0B	10 0S	10 0	...	9 0B	9 0B
Rand Nucleus ...	2 11	2 9B	2 10B	2 10B	...	2 11B
Randfontein Estates	28 0	27 9B	27 9B	28 0	27 6B	27 6S
Randfontein Deeps...	4 0B	4 0B	4 0	4 0B	4 0S	4 0B
Rooiberg Minerals ...	37 0	36 3	36 6	36 3B	35 0B	35 6S
Rand Klips	6 9B	7 3	7 5	7 1	6 3	6 6B
Ryan Nigels ...	4 0S	4 0B	...	...	...	...
Rood. Durban Deeps	26 0B	26 0B	26 0B	26 0B	26 0B	26 0B
Robinson Deeps ...	...	52 6B	...	...	...	...
Swaziland Tins	37 0S	...	...	...	...	...
Salisburys	...	3 6S	...	...	...	...
Simmer Deeps ...	...	4 0S	4 0S	4 0B	4 0S	3 0B
South African Lands	4 5	4 3	4 4	4 3B	4 4B	4 4
S.A. Tin Mines ...	7 0B	7 0	...	...	...	...
S. Randfontein Deeps	4 0S	3 3B	3 6B	3 6S	3 6B	...
Sub Nigels	5 0B	5 3B	5 3B	5 0B	...	...
S. A. Breweries ...	40 0B	...	...	...	...	...
Springs Mines ...	16 3	15 3B	...	15 6B	17 0S	16 3S
Trans. G.M. Estates	...	47 6B	46 9B	...	...	46 3S
Temple Tins... ...	3 3B	3 9S	3 4B	3 6B	...	3 6
Trans. Coal Trusts...	48 9	48 6B	48 6B	48 3B	48 0B	49 0S
Trans. Cons. Lands	...	...	32 6S	30 0B	...	30 0B
Tudors	...	2 0S	1 0B	1 0B	2 0S	1 0B
Van Ryn Deeps ...	20 3B	20 6B	20 0B	20 0S	20 3B	20 0
Village Deeps ...	41 6B	41 6B	41 6B	41 6	41 3B	41 3B
Vogel. Cons. Deeps...	1 0B	1 1B	1 0B	1 6S	1 0B	1 6S
Voorspoed Diamonds	10 0B	10 0B	10 0B	10 0B	10 0B	...
Van Dyks	...	...	2 0B	...	...	...
West Rand Con. ...	...	...	10 6B	...	...	...
Witwatersrands ...	...	55 0B	55 0B	...	55 0B	55 0B
Wolhuters	20 6B	20 6B	20 9B	20 6B	20 3	20 3B
Witbank Collieries...	...	40 0B	40 0B	...	40 0B	...
Wit. Deeps	55 6S	56 0S	53 0B	56 0S	55 0S	53 0S
West Rand Est. ...	2 9B	...	2 9B	2 9B	...	...
Zaaiplaats	41 3B	40 0B	40 0B	45 0	44 0B	46 0B

B Buyers. S Sellers.

Rezende Mines.

The operations of Rezende Mines during 1911 resulted in a working profit of £12,298, in addition to which the company received in the shape of royalty on gold and concentrates won by tributers, £3,247, making together £15,545. After providing for London expenses, £1,340, depreciation, £2,066, etc., there remained a credit balance of £13,110. This is added to the amount brought forward from the previous year—£9,314—making a total £22,424, which it is proposed to carry forward. The reasons given by the directors for making no dividend distribution are threefold, viz: (a) Certain negotiations pending between the company and the Penhalonga Mines, Ltd.; (b) the development of the old west workings which will necessarily entail certain expenditure; (c) the cost of the auxiliary power plant on the Odzani River. The installation of the latter was commenced in August last. The ore reserves consist of 102,248 tons fully developed and 36,268 tons partially developed. Of the 102,248 tons fully developed, 80,928 tons have an average estimated value of 7 dwt., while the remaining 21,500 tons represent the developed ore in the old west workings, the value of which cannot be given till the sampling results have been confirmed by trial crushings. These reserves do not include the balance of ore in the old west workings remaining to be worked by tributers amounting to 40,000 tons. Forty-two thousand four hundred tons of ore were crushed during the year, and the revenue per ton amounted to 27s. 2.31d., whilst working costs amounted to 21s. 4.69d., leaving a profit of 5s. 9.62d. per ton. The financial results are somewhat less favourable than were anticipated, owing to a fall in grade from 7.6 dwts. to 7.03 dwts., and to a loss in tonnage milled, the latter due to the hanging up of 10 stamps for repairs for 39 days.

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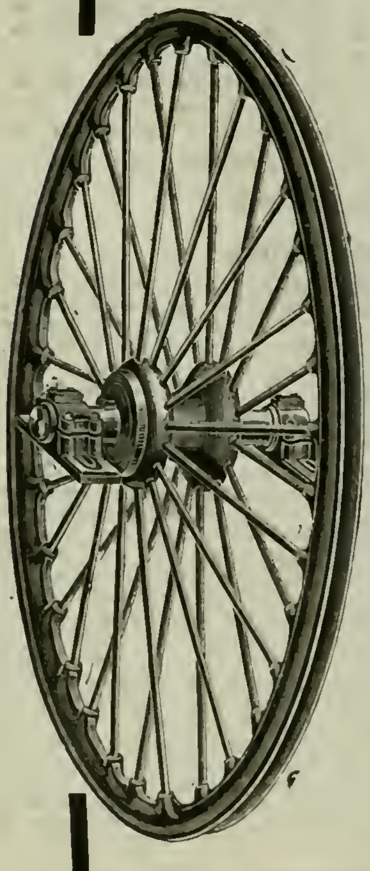

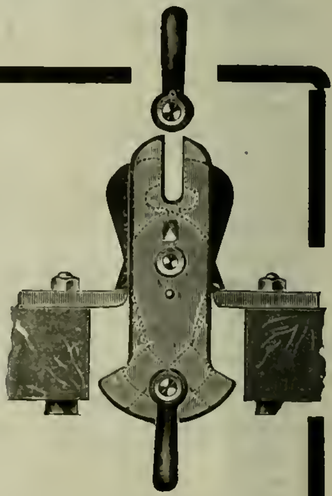

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Engineering Notes and News.

NEW RAILWAYS: COMMISSIONERS' REPORT.

Three Lines in Natal—The Vierfontein-Bothaville Extension.

More than two-fifths as regards mileage, and almost half with respect to expense of the new railways for the Union, proposed under the Government's new construction programme for the current year, are to be laid down in the Cape Province. The total additions to the Union system, according to the just issued report of the Railway Commissioners, aggregate a mileage of 562½, of which the Cape receives 239¾. The total cost of all the new undertakings put together amounts to £2,704,040, and of this the Cape's proportion is £1,208,740. The new mileage allocated to the Transvaal is 111½ (£545,355); to the Free State, 109 (£541,808); and to Natal 102¼ (£408,137). The longest single new stretch of line included in the proposals is that from Carnarvon to Calvinia, Cape Province, 222½ miles. Natal receives the second longest in the programme, with 50¼ miles from Paddock (Murchison Flats) to Harding, though this line is of the narrow 2ft. guage. Probably the most interesting at the moment of the undertakings with which the Government have come forward for this year's construction is the proposed line from Vierfontein to Bothaville, in the Free State. Warm criticism has been directed against this feature of the Administration's programme, on account of its disregarding the necessity for a railway being built immediately to connect Vierfontein with Kroonstad, in compliance with the undertaking entered into by the late Transvaal Government with Natal, when the latter completed the extension to Kroonstad from Bethlebem in 1906. The report of the Railway Commissioners with regard to this proposal has been awaited with much expectancy. Now that the document is forthcoming, it does not seem to promise any great satisfaction to those who were hoping to find it laid down as the fixed intention of the authorities to eventually connect up this short stretch of railway with Kroonstad, and thus afford Natal the important communication with the western Transvaal system which this Province sought when the Kroonstad undertaking was entered into. "The Board," the Commissioners observe—the report bears the signature of Mr. Sauer in addition to those of the other three Commissioners—"with every desire of promoting the development of the district by the provision of rail transport for the conveyance of its produce to the large consuming centres, would have felt considerable difficulty in recommending the construction of this line, but for its expectation that as soon as opportunity offers after the extension has reached Bothaville, its construction will be continued along the valley of the Valsch River to form a junction with the Free State main line at or near Kroonstad." The position, so far as the Railway Commissioners are concerned, will be seen, therefore, to be wholly indeterminate. The estimates of revenue and expenditure regarding the line show that it is not anticipated that the earnings will be sufficient to cover working expenses, but the Board express the opinion that "if and when the line is extended as suggested, the railway will become more than self-supporting." The length of the line is 26 miles, it will be on the standard gauge, its ruling gradient will be 1 in 100, its estimated cost, inclusive of rolling stock, is £106,485, and the Commissioners expect a deficit of £4,677 on the first year's working. It is to be noticed that the departmental reports contained in the annexures deal with a survey from Vierfontein to the township of Hoopstad, via Bothaville, in two sections, but the Board bestow notice only upon the first section, from Vierfontein to Bothaville. The three new lines proposed for Natal are Ginginhlovu-Eshowe, Schroeders-Harburg, and Paddock-Harding. The first and third are recommended to be on the narrow 2ft. gauge, and the second on the standard 3ft. 6in. gauge. With regard to the Ginginhlovu-Eshowe railway, the Board are evidently more in favour of this line being constructed on the standard rather than the narrow gauge, since they observe that they recommend the latter only with "considerable reluctance," but they decided on the 2ft. gauge owing to the broken nature of the country and the high cost of a standard gauge line. "The branch," the Commissioners remark, "should only be considered as the first instalment of a railway towards Fort Yolland, through a section of the country which it is anticipated will eventually prove to be the leading farming district in Zululand." The approximate length of the line is 24 miles, and with 35lb. rails and a ruling grade of 1 in 40, its estimated cost, including £300 per mile for rolling stock, is £104,440. The railway is expected to lose £1,400 on its first year's working. The estimate as to the cost of construction is that of the Railway Board, whose report is dated April 26, but on December 1 last a net estimate was sent in to the General Manager by Mr. D. P. Head, the engineer in charge of the survey, placing the amount at £97,240. This was based on 30lb. material, and the estimate was afterwards raised to allow of 35lb. rails being laid in, the final estimate of the Engineer-in-Chief being £109,912. The lower amount at which the Railway Board's estimate is placed is due to the Commissioners allowing only £300 per mile for rolling stock instead of £500 per mile contemplated by the Chief Engineer's department. The previous reports concerning surveys of the line by engineers attached to the late N.G.R. administration are reproduced in the annexures, one of which comprises a report from Mr. W. H. Cobley, then superintending engineer, surveys and construction, dated February, 1908, in which he discusses a survey he had carried out of a line from Umhlatuzi, 116 miles from Durban to Vryheid, via Melmoth, Babanango, and Nkandhla, the length of which was to have been 210 miles. A 2ft. gauge railway was contemplated. The first survey of the Ginginhlovu-Eshowe line took place in 1902, a 2ft. gauge railway being then held in view. Mr. Cobley then estimated the cost of the line, whose length he calculated at 21 miles instead of the 24 miles now given, at £60,000, and £10,000 for equipment, making £70,000 in all against the present estimate of £104,440. On the opposite extremity of the Natal coast line another 2ft. gauge railway is proposed—or rather the continuation of a narrow gauge railway—namely, the Paddock-Harding line. This is an extension of the railway opened last year from Port Shepstone to Murchison Flats. The new line will be approximately 50¼ miles in length, its ruling grade will be 1 in 38, and its estimated cost with 35lb. metals, is £181,697. The Commissioners expect the line to lase £7,192 for the first twelve months of its working, but they remark: "The result of working the section Port Shepstone to Paddock for November and December last (the only figures available) show a loss of only £39, and, therefore, it can reasonably be expected that the traffic which will accrue from the extension of a non-paying short branch (24 miles) will be turned into one which will, in addition to paying working costs and depreciation, contribute towards interest on capital. This result will be assisted by the cheaper cost of working, since the rolling stock will be used to greater advantage, and engines will have a fair day's work to do, which at present is not the case." In estimating the traffic receipts, the Commissioners refer to the production of mealies, potatoes, fruit, and wattles in the district, and also to the amount of stock-raising carried on in the vicinity of the route. They also anticipate that the large number of Pondo boys engaged for work at the Rand, who at present walk to Richmond and take the train there, will travel by the new line and make their journey via Durban in future. In this instance, again, the estimate of the Engineer-in-Chief as to the cost of construction differs from that of the Commissioners, the total given by Mr. Tippett in 1910 being £159,317, including rolling stock. The stations would be similar in type to those on the Stuartstown railway, and are proposed as follows:—Murchison (24 miles), Izingolweni (36 miles), Celeban Spruit (48½ miles), Ikondwan River (58 miles), Ihluku Halt (66½ miles), Harding Station (72½ miles). The only standard gauge construction proposed in Natal under the present year's programme is a section 28 miles in length from Schroeders station on the Greytown line to four miles beyond Harburg. The Commissioners report: "The branch traverses an extensively cultivated district occupied by a considerable white population engaged in agricultural pursuits, which will ensure its success financially from the beginning." The Board nevertheless anticipates a net loss of £1,956 on the first year's working. They add: "The district is eminently suitable for the growth of the commercial wattle, and this, in addition to agricultural produce, will provide a heavy and continuous traffic. It is also a good stock district, and considerable revenue can be expected from this source, as also from the conveyance of dairy produce." The ruling gradient of the line as surveyed will be 1 in 40, and its total cost is estimated at £122,000.

Cheap Electric Light.

At the meeting of the Durban Town Council last week, it was stated that the Corporation now had the sole monopoly for the supply of electric light and current to Durban and district, the Corporation having purchased from the Government £26,000 worth of plant in use at the railway shops, and invested in £50,000 worth of absolutely new machinery. The railway has agreed to pay ¾d. a unit, giving a revenue of £7,500 a year, seeing that the railway consumes 200,000 units a month. It is stated that users of steam machinery are scrapping it in favour of electric current. The Town Council hopes to reduce their price for current as the result of the Government becoming their customers.

Koffyfontein Diamonds.

Diamonds to the value of £25,102 19s. (10,168 carats) were registered by the D.A.R.M. of Koffyfontein during the month of May.

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→ **3** ←

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2. **TRANSVAAL** Mines have spent 24 millions sterling on machinery and plant.
3. The **"South African Mining Journal"** is the **Official Organ** of the **Mine Managers' Association.**

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Cylinders and Crank Shafts Accurately Ground, and Bearings Remetaled.

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Automobile Notes.

Accidents and Identification.

In view of the increasing motor traffic with which, it is to be regretted, a large percentage of street accidents are wrongly associated, it has been deemed advisable to impress upon the individual public the wisdom of carrying a card, note book, or some such source of identification as a precautionary measure, recognising the frequency of accident, and the difficulty which may arise when no clue to identity is afforded, in cases, for example, where the victim of an accident may be rendered unconscious. The suggestion may not be altogether so undue as it appears at first sight, when one has respect to the feelings of friends and relatives who may be entirely ignorant of what has transpired in the case of a serious accident. This provision which, obviously, is more applicable to large European cities, where it is often hard to trace the missing has, however, much to recommend it in Johannesburg, which is credited with possessing a very mixed population, a large proportion of which is, what has been termed, the "floating" type.

The Main Reef Road.

The greater portion, by far, of the main reef road, east and west of Johannesburg, which is perhaps the most frequented highway in the Union, lies at the present time inches deep in dust, and the inconvenience motorists are subject to when the prevailing winds convert this thick road coating into dense clouds, through which it is often impossible to see more than a few yards ahead, is very terrible indeed. Apart from the inconvenience thus caused, it is a source of much wonder that so few really bad accidents are reported as occurring on this thoroughfare, for, when the wind, better described as a gale, at times plays havoc with the adjacent dumps bringing their additional dust to bear upon the already half suffocated motorist, it appears that only to a due respect for the rules of the road on the part of motor car drivers can be attributed the paucity of accident, as seeing, under the conditions described, at this season of the year in particular, is quite out of the question. Many long suffering motorists who frequent this road largely can endorse this view in regard to the dust nuisance. It is difficult to advise in the matter of the dumps, but the question of macadamising the road surface, and treating it with tar—the most satisfactory and approved method for allaying dust yet attempted in these parts—should be urged with a greater insistence than is the case, on the authorities responsible for the maintenance of this highway. And while on the subject of this great main road the attention of the Railway Administration, it may be suggested, should be called to the unprotected state of many railway crossings, particularly on the East Rand section. Judging by the tone of recent letters to the Press on the matter, one must incline to the belief that public feeling is running very high at present in regard to this most vexed question.

The Reyersbach Trophy.

That the Reyersbach, to be held on the 30th inst., is still the most popular event on the T.A.C. programme is apparent from the great interest which is being taken in the event by the motorist community. The entries, it is expected, will eclipse even those of former occasions, and there seems no reason why they should not constitute a record, having in view the ideal weather conditions which usually prevail at that time. The venue referred to last week, while not altogether ideal, is, however, fair on the whole, and will present nothing which could be defined as a barrier to any competitor. Several enthusiasts have already been scrutinising the course, and have formed favourable impressions in regard to its suitability to decide a contest of the nature of the Reyersbach.

Wire Wheels.

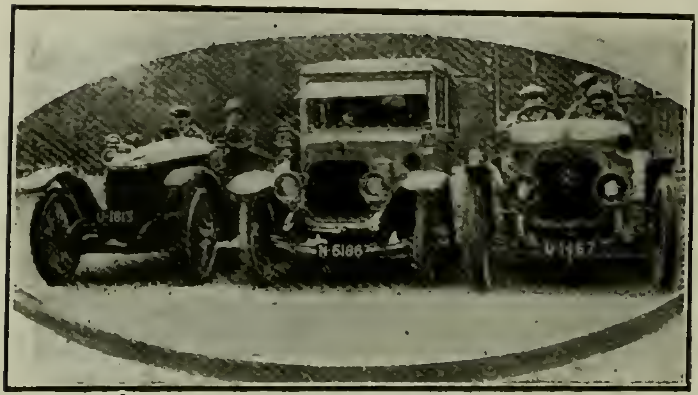
The above photograph, reproduced, is of a car which, after a violent skid, charged a bank and overturned. None of the wire wheels, however, with which it was fitted, were damaged, although the front axle was knocked clean off in the impact. This fact bears eloquent testimony to the terrific strain to which wire wheels may be subjected, and yet escape serious damage.

The second illustration, on the other hand, of an accident to a car which got out of control, depicts the wooden artillery wheels hopelessly smashed, forces the conviction that manufacturers by adopting the wire wheel so largely to-day have taken a decided step in the right direction. In fact, no colonial car is considered quite complete without the inclusion in the specification of wire wheel fitments.

The fact of gears being in mesh, through oversight, when the starting handle is operated is a source of danger which the average motorist disregards to a great extent, but though accidents from the cause are fortunately very rare the danger is none the less real. Many motorists are quite indifferent to the importance of examining the gear lever preparatory to starting up, when the car has been left standing for perhaps a short time, assuming that the levers are in the correct position. During a motorist's absence, however, the gear lever can be easily shifted, and if undetected the inevitable accident follows the starting experiment. The apparent remedy lies in the self-starting devices which, by the way, are coming much into vogue on American machines especially, and while still open to much improvement serves to largely eliminate the danger referred to. A car fitted with a self-starter prevents the possibility of a person being run over by his own car, and even though the gear by mischance has been left in mesh on such a machine, the driver is already in position directly the car is set in motion, and the accident, unavoidable under other circumstances, is averted.

The Vauxhall.

The triple triumph in the Manchester A.C. Reliability Trial is one of those frequently recurring proofs of quality which wins for the Vauxhall the preference of connoisseurs who select it because they consider it more reliable and better value than many other present day makes of cars.



The above illustration is of the three Vauxhalls responsible for this great achievement, of which the local agents are justly proud. The car with the pointed bonnet is the already famous "Prince Henry" type, which derived its name from the international contest, in which the Prince of that name was the prime mover. One of these types is now running in Johannesburg, and attracts much attention, both on the score of its graceful lines and smoothness of running.

"The elimination of the cut-out will put an end to what may be considered the most unnecessary of all street noises," says an American contemporary. Already a measure has been introduced by the New York municipal authorities with this end in view, and it is predicted that it is only a question of time until similar prohibitive measures are recognised in all European countries. Briefly, the ordinance referred to provides that every motor shall be equipped with a muffler or silencer through which all exhaust gasses must pass, and prohibits the use of a muffler cut-out or any device that will permit the exhaust gasses to escape into the atmosphere without first passing through the muffler. The "cut-out" is barred in exactly similar fashion by a recent order of the English Local Government Board, under the Motor Car Acts, the only difference being that the order in England does not apply to motor cycles, whereas in the States the provision embraces the "ubiquitous bike." So far as Johannesburg, by way of comparison, is concerned, the noises most in evidence are certainly those created by the auto-cycle, but how to effectively deal with them is a moot question, especially in view of a local stipendary's recent ruling in this connection.

Jennings' Patch.

One of the nightmares of the motorist is the fear of tyre troubles in travelling. Stepneys, extra wheels, extra tubes, etc., have only partially overcome the troubles. It has remained for a Randite, Mr. Robert Jennings, of the Ingersoll-Rand Co., to invent a simple device, which may be carried in the pocket, to overcome all tyre trouble. The device consists of two pads, made to fit each other, which securely

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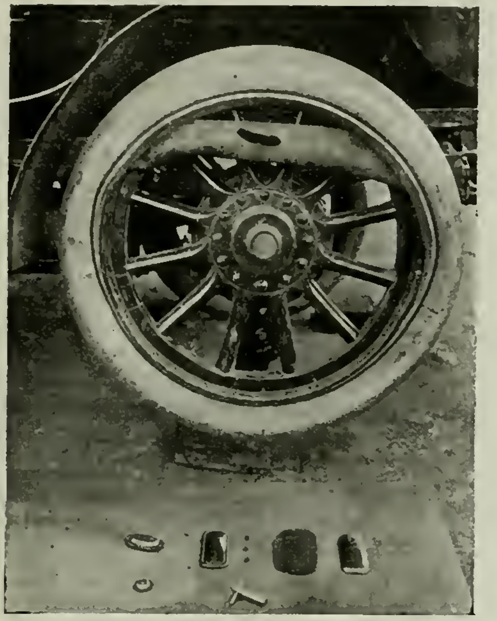
Cross Section of Repair

closes the hole in the tube, whether it be a pin-hole or a six-inch gash. These pads may be made of metal or fibre. The one illustration shows the tube with a 4-inch hole. The complete repair kit is shown in the foreground. On the extreme left are shown two smaller patches. The rest shows in detail the larger patch. The nether piece has several small studs. This piece is put on the inside of the tube, the piece of leather is put on top to give resiliency and pinch the ragged edges of the hole; and on top is put another piece of metal (shown in the extreme right), the whole being pulled tightly together by the three small nuts, which engage the studs shown on the bottom piece. The only tool necessary in the whole operation is a small box spanner. Before offering it to the public, Mr. Jennings made a thorough test of the durability of the device on several cars. On his own car he tried the three patches shown in the picture, and when they were removed, after the car had been run over six hundred miles, there had been no apparent loss of air, and neither the tube nor the cover were in any way damaged. Should each motorist carry a few of these patches, it would do away with the necessity of carrying spare tubes.



TUBE SHOWING A 4-INCH BURST. (REPAIR KIT IN THE FOREGROUND.

TUBE WITH PATCH IN POSITION.

Finance, Commerce, and Industries.

Building Operations.

During May of this year in the Johannesburg municipal area plans were approved for 105 dwellings, thirty-seven stores, and ninety-five other buildings, not to mention drains, etc., to a total value of £91,215. In May of last year the total amount was £180,769. Nevertheless the building work for the eleven months ended May 31, 1912, totalled £1,546,197 as against £1,438,895 for the full twelve months ended June 30, 1911. In 1910 the total was £1,108,731, and 1909, £435,457.

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Railway Progress in Rhodesia.

The net result of the operations conducted during the year ended 30th September last by the railways serving Rhodesia was, shortly, a continuance of the improvement which was noticeable in the previous twelve months, and while the rate of progress shows considerable variation as between the leading systems, its indications are in every case unmistakable. The reports for 1910-11 of the Rhodesia Railways and of the Mashonaland Railway Company show that the position is such as to justify the hopes which exist of a prosperous commercial future, quite apart from the mining industry, upon which they have hitherto depended to a very large extent. Whatever improvement is now shown in the revenue position has been secured notwithstanding a substantial reduction in the earnings derived from the conveyance of construction material. Hitherto this class of freight has formed a considerable proportion of the total carried, but it has now sunk to very modest dimensions. At the same time, the revenue derived from the transport of general goods increased during the past year in a manner which can only be described as very gratifying; passenger receipts also advanced substantially. These improvements have also been accompanied by a satisfactory reduction in the ratio of operating charges.

* * * *

East African Shipping.

It is reported that, as the result of negotiations which have been in progress since the beginning of the year, an agreement between the British and German steamship lines on the East Coast will take effect until the end of June, 1913. The former working arrangement terminated on December 31 last, owing to the desire of the German East African Line to open up discussion on certain points arising out of developments by the British companies *via* the Suez Canal, particularly with reference to the definition of each concern's sphere of operations. No rate-cutting has, however, taken place, and it is probable that the understanding now arrived at may lead to more extended co-operation. In this connection it must not be overlooked that the Union-Castle Line has decided upon regular calls at Porto Amelia, in Portuguese East Africa, from which a railway is projected to Lake Nyasa.

* * * *

South African Association.

The seventy-sixth annual meeting of shareholders of the South African Association for the Administration and Settlement of Estates, was held last week. The report of the directors stated that the profits for the year, including £118 2s. 5d. brought forward, amounted to £11,252 5s. 11d., after providing for £2,918 10s. 6d. interest considered irrecoverable. The directors proposed to appropriate the balance as follows: Directors fees, £750; auditors' fees, £200; transfer to reserve fund in terms of the provisions of the Act of Incorporation, £2,500; depreciation office furniture, £71 7s.; dividend to shareholders at £45 per share, £7,560; balance carried forward, £170 18s. 11d.; total, £11,252 5s. 11d. With the foregoing addition of £2,500 the reserve fund would amount to £83,000. The dividend protecting fund stood at £10,000. Tre difficulty in securing suitable outlets for the investment of the funds of the Association, and the lower rate of interest that at present prevailed had naturally reflected on the earnings of the company, but the directors were pleased to say that in spite of these drawbacks the profits had been well maintained, and the funds under administration materially increased. The President, in moving the adoption of the report, said that the gross earnings were less than last year, but the difference was to a great extent equalised by a reduction in the expenses of management (which were less than they had been during the last ten years), and in the amount of interest to be written off as irrecoverable. At the same time, the interest paid on trust funds was about £700 more. The net result, therefore, was that they had a profit for division of £11,252 against one of £11,678 available for distribution last year.

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Supplementary Estimates.

The Union Supplementary Estimates of the expenditure to be defrayed during the year ending March 31, 1913, were issued this week, the grand total being £280,699, and the totals of the various departments as follows: House of Assembly, £444; Agriculture, £14,106; Agricultural Education, £750; Interior, £8,000; Magistrates, £2,530; Prisons and Reformatories, £875; Mines, £6,000; Higher Education, £12,570; Treasury, £1,080; Inland Revenue, £1,750; Public Debt, £140,000; Provincial Administrations, £7,000; Lands, £13,800; Surveyors-General, £1,400; Native Affairs, £8,920; Commerce and Industries, £600; Public Works Department, £10,000; Buildings and Bridges, £47,874; Posts, Telegraphs and Telephones, £3,000; total, £280,699. The grand total of the expenditure to be defrayed during the year has thus been increased from £16,782,343 to £17,063,042.

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Iron Ore on Pretoria Town Lands.

At the last meeting of the Pretoria Town Council the Special Commission laid on the table its preliminary report in the following terms:—

The Commission was appointed by resolution of the Council taken on the 3rd May, 1912, with the terms of reference reading: That a Commission, consisting of Councillors Joubert, Roos, and Simon and De Vries, be appointed to consider and report on the question of the exploitation of iron ore deposits on the town lands of Pretoria, and the best means of dealing with the matter in the interests of the ratepayers. That the Commission be authorised to call for such evidence as may be deemed necessary. On the evidence submitted it is perfectly clear that the Swedish sponge iron process has made the conclusions of Government Commissions worthless on the question of the practicabiity of establishing an iron industry in this country; although their conclusions as to the extreme value of such an industry to the country remain unaffected. In fact the difficulty formerly standing in the way, viz., the inferiority of South African coke, has been swept away by the process. Coal, inferior to our coal, is used in connection with the new process in Sweden, and lower grade iron ore than ours is treated. Mr. C. F. Delfos, of Pretoria, who has for a considerable period been in correspondence with the inventor of the new process in Sweden, is prepared to act for the Municipality free of charge in conducting the necessary correspondence and sending what is necessary for a preliminary test. He states that to test 500lbs. of ore with 500lbs. of coal would cost not more than £50, and he is convinced that the test will show the advisability of taking further steps in the matter. There are further important questions arising as to the amount of iron ore available and the like, which we would desire to go into. They therefore recommended: (a) That a sum of £50 be voted for the purpose of a preliminary test in Sweden; (b) that Mr. C. F. Delfos be asked to conduct the necessary correspondence and send the necessary ore and coal for the purpose of such test, and that the above mentioned sum of £50 be paid to Mr. Delfos as and when he may require it; (c) that Mr. Delfos be further requested to deal in his correspondence with the question of the terms on which the Swedish patent could be used by the Municipality of Pretoria, if the test proves successful; (d) that on the Council obtaining a report on the result of the test, this Commission deal with the matter further and again report to the Council. This was agreed to.

New Companies.

3985. Carr Regis and Newbery, Ltd., 5 and 6, B. and T. Buildings, 68, Commissioner Street, Johannesburg; capital, £6,000.
3986. South African Golf Ball Co., Ltd., 4, 7, and 8, Trust Buildings, Fox Street, Johannesburg: capital, £600.
3987. Globe Literary Agents, Ltd., 45, Kerk Street, Johannesburg; capital, £500
3990. Bull and Oehmen, Ltd., 23a, Rissik Street, Johannesburg; capital, £6,000.
3991. South Africa Kinemacolor Co., Ltd., 35, Steytler's Buildings, Loveday Street, Johannesburg; capital, £5,500.
3994. Robert Hamilton, Ltd., 247 and 249, Church Street, Pretoria; capital, £22,500.
3995. West Rand Unified, Ltd., 29-35, Jeppe Arcade, Commissioner Street, Johannesburg; capital, £187,500.
3996. Arcadia Tea Rooms, Ltd., Stand 462, Ockerse Street, Krugersdorp; capital, £500.
3998. Rex Zaaiplaats Central Tin, Ltd., Bettelheim Buildings, Simmonds Street, Johannesburg; capital, £22,000.
3999. Autocar Exchange, Ltd., 67, Marshall Street, Johannesburg: capital, £700.
4000. Lamb, Raphaely and Co., Ltd., 19a, Simmonds Street, Johannesburg; capital, £2,000.
4001. Benoni Exploration Syndicate, Ltd., 8, Orr's Buildings, corner Market Avenue and Fort Street, Benoni; capital, £1,500.

Foreign Companies Registered.

3988. The Natal Creamery, Ltd., c/o Alexander Drysdale, manager, Volksrust Creamery, Volksrust: capital, £30,000.
3989. Main Reef Extensions, Ltd., c/o F. J. Quinton, 28 and 29, Goodman's Buildings, Johannesburg; capital, £200,000.
3993. Standard Oil Company of New York, c/o Charles D. Healy, 86, Standard Bank Chambers, Johannesburg; capital, 15,000,000 dols.
3992. The Koffyfontein East Diamond Mining and Estates, Ltd., c/o Edmund Leonard Bray, Solicitor, Norwich Union Buildings, Fox Street, Johannesburg: capital, £12,000.
3997. Rand Rieshas, Ltd., c/o Johan William Ball, Van Beek Street, Doornfontein, Johannesburg: capital, £2,100.

Increases of Capital.

880. The Artesian Mineral Waters, Ltd., Johannesburg; from £600 to £900.
2937. The Farmers' Agency (Co-operative), Ltd., Johannesburg; from £2,000 to £2,300.
3799. Sands, Ltd., Johannesburg; £11,000 to £12,500.
3906. Eastern Whaling Co., Ltd., Johannesburg; from £45,000 to £60,000.
1623. Geduld Proprietary Mines, Ltd., Johannesburg; from £750,000 to £875,000.
3880. The Premier Whaling Co., Ltd., Johannesburg; from £45,000 to £60,000.
2304. The New Rand, Ltd., Johannesburg; from £134,349 to £135,802.
3773. The East Coast Timber Co., Ltd., Johannesburg; from £1,200 to £1,500.

Companies in Liquidation.

Waterberg Gold, Land Investment and Exploration Syndicate, Ltd.; meeting will be held at 19a Simmonds Street, Johannesburg, on June 26th. H. J. Lamb, liquidator.

Coliseum, Ltd.; a list of contributories will lie at the Master's office and A.M.'s office, Johannesburg, for 21 days, from May 28th. Alexander Rodger, liquidator.

De Carolina Kooperatieve Vereniging; claims to be filed on or before June 26th, and debts paid on or before June 13th to Altmann and Brugman.

Obey Slater and Hardt, Ltd.; Algernon Osmond Miles, of 28, King Street, Cheapside, London, has been appointed liquidator.

Weynek Tin Company, Ltd.; a meeting of creditors will be held before the A.R.M., Johannesburg, on June 13th. H. Hargreaves, liquidator.

Goldfields of Matabeleland, Ltd.; final liquidation and distribution account concurrently at the A.R.M.'s office, Johannesburg, and the Master's office, Pretoria, for 14 days, from May 31st.

New Orion Mijnpacht Gold Mining Syndicate, Ltd.; The (voluntary), May 21st: meeting will be held on June 6th, at 133 and 134 Stock Exchange Buildings, Johannesburg. J. H. L. Manisty, liquidator.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

The Week's Company Meetings.

GENERAL MININGS.

SIR GEORGE ALBU'S REVIEW

A Reassuring Speech.

Position of Subsidiary Companies.

Reply to Critics.

Advice to Government.

The twelfth ordinary general meeting of shareholders of the General Mining and Finance Corporation, Ltd., was held on June 7th, in the boardroom, General Mining Buildings, Sir George Albu presiding. There were 790,756 shares represented out of an issue of 1,875,000.

The Chairman, in moving the adoption of the report and accounts, said:

Chairman's Speech.

Gentlemen,—The directors' report on the operations of the corporation for the past financial year, and the balance sheet and profit and loss account as at the 31st December last, were issued to shareholders simultaneously from the Johannesburg, London, Berlin, and Paris offices of your company on the 25th April last, so that on this occasion you have had several weeks in which to digest the reports and accounts before forwarding your proxies for this meeting. For some time past we had been considering the practicability of issuing the annual accounts to shareholders in sufficient time before the meetings—not only of your corporation, but also of the subsidiary companies under its control—to allow of ample opportunity for their study: the adoption of this course entailed a certain amount of delay in the holding of the meetings, in the instance of the subsidiary companies, but we came to the conclusion that shareholders would count this of slight consequence compared to the advantage of being in possession of the annual reports, etc., before giving their proxies, and we therefore decided on the new policy and made an official intimation through the Press, both here and in Europe, in the middle of January last, to that effect. This public announcement of our intentions was very favourably received by the financial Press and the public generally, and was quickly followed by similar official proclamations from practically the whole of the other South African mining houses. In the instance of your corporation, the innovation referred to has made very little difference in the date of the annual meeting, which has been usually held towards the end of May in each year.

Disappointing Year.

The position disclosed by the report and accounts for the year under review cannot be regarded as anything but disappointing, from the immediate point of view of profit and loss. The financial depression which prevailed during the past year, and which unfortunately is still being experienced, has had a most prejudicial effect (although, I am sure, to a great extent only a temporary one) on the market quotations of the stocks, shares, and even debentures held by your corporation, the consequence of which is only partially shown in the amount of £231,292, which we have had to write off the book value of our interests in certain of the companies under our management and of other companies also. Over and above this direct charge to profit and loss account there is also the further aspect of the general depreciation in the market quotations for other stocks and shares held by us, which does not show in the accounts by reason of the fact that the value at which these holdings stand in our books is still below the ruling prices on the Stock Exchange. In viewing this matter, however, it must be borne in mind that neither the depreciation actually written off some nor the reduced market quotations for other holdings represent realised losses: any appreciable improvement in the share market for South African securities would, of course, be reflected in an enhanced general value of your corporation's holdings. As a matter of fact, this feature is a possibility or probability which has materialised in concrete form and to a very substantial degree several times in the history of your corporation.

Existing Pessimism.

Whether history will repeat itself in this respect during the current year is a question on which I am not prepared to venture any opinion or prediction to-day, but I must state my conviction that the existing pessimism and apathy in regard to Rand mining companies has reached a point altogether unwarranted by the actual position of affairs on these fields, and that the present quotations for the shares of reputable and promising propositions—not only of profit-earning mines but also of properties in the developing stage — are standing at prices which in most cases represent a considerably lower level than the intrinsic value of the concerns in question. As an instance of this, I may say that there is quite a number of companies the shares of which to-day are quoted at a figure which does not represent even the actual expenditure on the equipment and development of their properties, and therefore does not allow a single penny for the value of the reef claims held. In face of such ultra-pessimism as this, it is no matter for surprise that in the instance of your corporation, which is so largely interested in the mining companies under its control, it has been found necessary, in order to maintain the principle of keeping its shareholdings at or below current market prices, to employ not only the working profit for the past year, but also the large balance brought forward from the previous year, in writing down assets, and so precluding any question of the declaration of a dividend for the period.

Accounts.

Turning now to the accounts for the past year, and comparing the balance sheet at the 31st December last with that at the close of the previous year, deposits show a decrease in amount of £104,000, being withdrawals of funds deposited with us by our subsidiary companies and required for their outlays on capital account or for other purposes. Bills payable at £262 is lower by £13,000 than the liability under this head in the previous balance sheet, and creditors for stock bought but not yet taken up also show a decrease of £2,000. On the other hand, sundry creditors are £353,000 higher. The reserve against house property has been augmented by £15,000, representing additional provision which we have thought it advisable to make in regard to our large holdings of real estate and house property in Johannesburg, making a total reserve at date in this respect of £35,000. Taking the other side of the balance sheet, stocks and shares in companies show an apparent decrease of £6,000: as a matter of fact, however, our holdings under this heading were actually increased on balance during the year to the extent of £160,000, the amounts which we had to write off certain of the shares in order to reduce the value in the books to the market quotations at the 31st December last, aggregating £166,000, accounting for the difference. Shares in other companies show by comparison an increase of £125,000, but this again does not represent the actual figure of the additional holdings acquired during the year, which really amounted to £161,000, the difference of £36,000 between the two figures being also in respect of certain shares which were written down to market prices. The amount standing under the head of debentures of public companies is higher by £117,000, representing the final instalments which fell due and were paid during the year on some of our holdings of debentures, less an amount of approximately £43,000 which we had to write off for depreciation in market value. Mining properties, claim holdings, etc., also stand at a higher figure by £15,000, due chiefly to our acquisition of the one-fourth remaining interest in the Beatrice Mine in Rhodesia. Advances against securities show a reduction of £147,000 by reason of certain loans having been paid off during the year under review; on the other hand, there is an increase of £40,000 in sundry debtors, representing the balance of further advances to certain of our subsidiary companies last year, after deducting repayments made by others. The reserve of £140,000 against possible loss on the two foregoing items is still, in my opinion, considerably in excess of any loss likely to be incurred in this direction. Debtors for stock sold but not yet delivered are reduced by £174,000, and bills receivable by £4,000, as compared with the previous balance sheet; this is, of course, a natural consequence of the decreased volume of business which could be done in the share market. Cash at banks and in hand also shows a decrease of £117,444.

Financial Position.

In all, the general effect of the changes detailed in the foregoing remarks is that whereas the corporation's liabilities have increased on balance (as compared with the position at the close of the previous year) by £234.000, and certain liquid assets have decreased to the extent of £442.000, on the other hand, there have been additions to shares and debentures and other liquid assets to the amount of £536.000. So that, excluding the question of depreciation, there is a net diminution of liquid assets of approximately £140.000, which practicall represents the dividend of 7½ per cent. paid out to shareholders in June last year in respects of the profits for the previous year.

Dealing with the profit and loss account, the first item of amount written off stocks, shares, etc., £281.292. I have already referred to in the earlier portion of my remarks. The loss on ventures, amounting to £6.642, represents the expenditure on prospecting propositions and preliminary investigation of other properties in Rhodesia which we had under option of purchase, but which we did not find sufficiently encouraging to acquire outright. Administration expenses show a decrease of £2.000 as compared with the previous year. Depreciation £146, is really the cost of additional furniture and fittings during the year for our offices, which, however, in pursuance of our previous policy we have written off in its entirety; you will observe from the balance sheet that the whole of the furniture, fixtures, and fittings at our Johannesburg, London, Berlin and Paris offices stands in the books at the nominal amount of 6s. The debit to profit and loss account of £15.000 in respect of additional reserve against house property I have already dealt with in my analysis of the balance sheet. Turning to the credit side of the account, the profit of £8.316 on stocks, shares, etc., realised compares very unfavourably with the corresponding credit of £141.784 in the profit and loss account for 1910 and affords another illustration of the state of depression which existed during last year in the money market. Sundry revenue shows a shortfall of £35.000 as compared with the previous year thus forming a further reflection of the unfavourable conditions with which we had to contend. The net resutl is that we are only able to carry forward a balance of £20.147 to the new year's account as compared with £260.432 brought forward from 1910 (after providing for the dividend declared for that year). This is a decidedly unsatisfactory state of affairs to have to record, but I trust that we have now reached bed-rock as regards both market conditions and labour troubles on the mines and that we shall consequently be able to show an improvement in the position of your corporation at the end of the current year.

Subsidiary Companies.

Following my usual course I now propose to review in detail the affairs of our subsidiary companies, in which the Corporation is so vitally interested, by reason not only of its holding of shares and debentures, but also, as regards the Roodepoort United, Aurora West United, and Rand Collieries, of the large advances which have been made to these three concerns.

Aurora West United.

The profit on mining operations for the past year of £30,466 was slightly less than for the previous year, owing to the increased cost of native labour. On the other hand, the ore reserves, which to-day stand at upwards of 400,000 tons, show an appreciable increase over the estimated figure at the end of 1910, and this is all the more satisfactory in view of the additional 20 stamps (making 80 in all), and equivalent extra cyanide works which have been erected, and the completion of the overhauling of the mill and renovation of the pile-blocks which was recently effected. This work was laid down for the purpose of increasing the milling capacity from the pre-existing figure of 11.000 tons per month to approximately 15.000 tons monthly. The full 80 stamps are now running, and it is hoped that the increased tonnage will soon be reached in the reduction works. In this connection I may mention that during the past month (May) the tonnage treated amounted to 14.072 tons, with a resultant working profit of £3.014. We are justified in assuming that the enlargement of the mill and cyanide works, now completed, will have a favourable effect in the direction of enhanced profits, and despite a certain amount of reorganisation work, both underground and at surface, which inevitably attends any appreciable extension of the scope of crushing operations, and which temporarily affects both working costs and revenue for some time afterwards, this anticipation is already being borne out by the improved results for May.

The company is indebted to your Corporation to the extent of approximately £174.000 for advances made. The market conditions obtaining during the past eighteen months have not permitted of the capitalisation of this debt, but a move in this direction has been made by the resolutions passed at an extraordinary general meeting of the company held on the 18th ultimo, which provide for the reduction of the nominal value of the existing shares from £1 to 10s., and the creation at such time and on such terms as the directors may deem fit of 387.295 new shares of 10s. each for the purpose of providing funds for the liquidation of the company's liabilities. It is probable that an agreement will be subsequently entered into between your corporation and the company, whereby the new shares will be under option at par to the Corporation for a reasonable period, in consideration of the continuation of the loan, and I hope that the better returns from the mine which we confidently expect and an improvement in market conditions in the near future will enable us to exercise the option, with beneficial results to both companies, as the liquidation of the debt will release all future profits for dividends. I may point out that the capital of the company, after including the 387.295 new shares, will only amount to the comparatively small total of £300,000.

Cinderella Consolidated.

I am pleased to say that notwithstanding the exceptional difficulties experienced by the management of this mine, during the whole of the past year and the earlier months of the current year, in the matter of scarcity of labour and restricted working conditions, considerable progress was effected in the direction of preparations for the large scheme of development of the property of over 2,100 reef bearing claims (with a length of strike on reef of 3 miles) on lines commensurate with its huge area. In the first place, the desired connection has been made with the Cason shaft of the East Rand Proprietary Mines, which now represents the second outlet from the Cinderella mine, and has therefore enabled the removal of all the restrictive measures placed on the working of the property by the single outlet committee. Instead of being strictly limited as to the number of men (white and black) allowed at work underground at any one time as heretofore, we are now in the position to work the property on similar lines to those ruling on any ordinary mine on these fields, and, unless present native labour conditions should materially alter for the worse, the effect of the lifting of this embargo will be shown during the rest of this year not only in improved mining and milling returns but also in the augmented scale of development work, with the consequent considerable increase of the ore reserves and the active prosecution of the scheme for opening up the ground lying between the Cinderella Deep (or western) shaft and the new central shaft now being sunk on the ground acquired from the Rand Central G. M. Co. when the big consolidation was effected about two years ago. The development of this large expanse of ground from the lower levels of the main incline shaft in the Cinderella Deep section towards the horizon of a similar main incline which will be sunk on the plane of the reef from the bottom of the new central shaft is the first stage of the larger scheme for the development of the property as a whole, and is of the greatest importance not only from the point of view of the connection to be subsequently effected between the two shafts (which are 4.800 feet apart), but in addition from the aspect that the work will open up several million tons of ore on the north section reef, which has been always found to be highly payable throughout the mine. At the same time the development of the ground under Boksburg Township (acquired from the Government) is being and will continue to be expeditiously effected, so that by the time the connection between the western and central shafts has been accomplished, the ore reserves should amount to upwards of two million tons, and allow of the second stage of milling operations being undertaken on a scale of crushing from 60.000 to 80.000 tons per month. The central shaft, which is expected to intersect the reef series at a depth of about 3.000 feet, has now reached a vertical depth of 1.965 feet.

As regards the present position of the mine, the fully developed ore reserves amounted at the close of the year to 740.000 tons of an average value of 6.73 dwts. per ton, and it is confidently anticipated that this figure will have been increased to at least 1.500.000 tons by the end of December next. There has been a very considerable accession of native labour to the property since February last, as a result of which the tonnage crushed and profits earned for March, April and May have been in steady progression, as the following figures will illustrate:

March, crushed 17,280 tons, working profit £5,027.

April, crushed 18,010 tons, working profit £6.007.

May, crushed 19,566 tons, working profit £6.056.

I earnestly believe that in its very large holding of shares in this company your corporation possesses an asset which will prove to be increasingly valuable year by year as the expansion of development operations proves the high payability and abnormally large extent of the ore contents of the property.

Meyer and Charlton.

The sanguine opinions which I have felt and from time to time expressed with regard to the prospects of this company since the acquisition of the new claims from the Government and the Lark Syndicate respectively, are being fully borne out by the actual results of mining and milling operations since the commencement of development in the new ground. The working profit for the nine months of actual crushing during the year ended 31st December last (i.e., exclusive of the three months during which the mill was shut down for renovation purposes and the completion of the new surface equipment) works out at an average of £10,500 per month. This figure, excellent as it is in view of the moderate scale of crushing operations and the comparatively small capital of the company, viz., £200,000, has been easily surpassed by the results obtained during the current year, which I think I may be pardoned for recapitulating in detail:

	Tons crushed.	Recovery per ton.	Working profit.	Working profit per ton.
January ...	14,064	38/9	£14,991	21/3
February .	13,118	40/3	£14,385	21/11
March ...	14 290	41/9	£17,094	23/11
April	13,800	42/11	£17,488	25/4
May	14 309	42/6	£17,106	23/10

At the annual meeting of the company held last month, I thought it advisable, in view of the high recovery value now being obtained, to explain that the average milling value of the ore reserves, of 10 dwts. per ton, and the still higher average value (11 dwts. per ton) of the 191,000 tons of ore developed during the past year, furnished practical evidence of the fact that, so far from an undue proportion of high grade rock having been crushed, the ore sent to the mill has contained an average grade rather below the value of the new ground as opened up last year and as now being disclosed by current development work. I may add that the drives on the lowest level so far reached in the property are disclosing values appreciably higher than the average value of the existing ore reserves, and there appears to be every practical reason for confidently anticipating that the working profits at present being earned will be maintained. In viewing these high returns, however, regard should be had to the percentage payable to the Government of the Union of South Africa in respect of the undermining rights of the Bewaarplaatsen, etc., acquired from it, which is equivalent to 11.06 per cent. of the annual net produce of the company.

New Goch.

At the previous annual meeting of your Corporation, in shortly reviewing the position of this mine I referred to the additional tube mill and cyanide tanks which were being installed for the purpose of raising the treatment capacity to about 30,000 tons per month. For the last half of the past year this average tonnage was actually crushed, and on the whole, considering the shortage of native labour experienced on the property, the results from production were fairly satisfactory for the year in regard to the working profit of £126,400 obtained for the period. Owing to the labour scarcity, however, development work had to be considerably curtailed, with the consequence that since January of the current year the tonnage treated, and therefore the working profits earned, have been appreciably lower, as certain of the stopes being worked fell below the values previously being obtained, and there were not sufficient additional working faces available to be temporarily substituted. This condition of affairs caused a considerable setback in the profits, which dropped from £7,500 in January to £3,100 in February, £3,900 for March, and £2,900 in April. The more vigorous policy of development rendered possible by an improvement in the native labour position during the past few months, and now being carried into effect, is showing very favourable results, as not only are additional points of attack being made available, but moreover the grade of the ore at present being developed is higher than the average of the pre-existing ore reserves. The returns for last month (May) form a material indication that mining conditions are approaching their more satisfactory former level, as both the tonnage milled (28,150 tons) and the working profit of £6,609 for that month are appreciably in excess of the results for the three previous months.

Roodepoort United.

Although the working profit earned by this company during the past financial year, amounting to £81,897, showed a very substantial advance on that for the previous year, the returns from the mine for the first four months of the current year form another instance of the difficulties which may attend the policy of continuing milling operations at the normal rate while development work is necessarily restricted owing either to native labour scarcity or other practical reasons. In the case of this company, shortage of labour was accompanied by the necessity for sinking the large 5-compartment shaft in the Kimberley section of the mine, and the Kimberley east shaft in the more eastern portion of the property, as expeditiously as possible, so as to enable the opening up of new levels in what now constitutes the main source of supply of the principal gold-carrying ore body—the south reef. It was hoped that the standard scale of gold production and profits could be maintained until the projected new levels had opened up more available faces for future operations, but in the meanwhile stope values in the existing workings on both main reef and south reef declined to some extent, with a corresponding effect on the outputs for the past few months. This, however, is purely a temporary matter, which will shortly be remedied, as four new levels are now being opened up in the Kimberley shaft, and two additional levels (the 3rd and 4th) are being developed in the Kimberley East section. It is fully anticipated, therefore, that a return to the more satisfactory level of profits obtaining last year will soon be rendered possible, and moreover that the progress of the more active policy of development now being carried out will result in an appreciable increase of the ore reserves.

In my remarks at the last annual meeting I informed you that a provisional agreement had been entered into between the Boards of the Roodepoort United and the Vogelstruis Estate Companies respectively for the acquisition of the property of the latter company—and at a later date a similar provisional agreement was also made for a like purpose with the Board of the Vogelstruis Consolidated Deep. It was also hoped that the proposed absorption of the two properties mentioned, entailing as it did the increase of the capital of the Roodepoort United would afford an opportunity for the liquidation or capitalisation of the debt due by the latter to your Corporation (amounting to £197,934 at the 31st December last), but the market conditions prevailing at the time when the special meetings were about to be called for the approval of the agreements by the respective companies, were such as to preclude any likelihood of the scheme being acceptable to the shareholders of the Roodepoort United—irrespective of the question of the capitalisation of the latter company's liabilities, and the proposals were consequently abandoned. The debt due to your Corporation was decreased by £51,825 during the past year, and the net profits now being earned are being applied in the further reduction of this indebtedness until such time as arrangements can be made for its capitalisation.

Van Ryn.

This company has fully maintained its successful career during the period under review. For the past financial year (which ended 30th June last) the gross profit on mining operations, with the addition of sundry revenue, amounted to £274,084, which allowed of the distribution of dividends aggregating £225,000, and equivalent to 45 per cent. for the year on the capital of the company, after writing off £16,300 for expenditure on permanent works, machinery and plant, etc., and £35,194 for Transvaal profits tax and English income tax. The returns for the eleven completed months of the current financial year reflect working profits on a slightly higher level. The installation of a new steel headgear and electrically driven winding engine at No. 2 shaft (for the purpose of hoisting ore not only from No. 2 mine, but also from No. 3 mine now being opened up) will be completed in July next, and arrangements are being made whereby the change over will be effected with a minimum of interference with normal milling operations. It is fully anticipated that the additional capital expenditure involved can be met out of profits without prejudicing the payment of the usual dividend of 45 per cent. for the year. The payable ore reserves at the 31st December last were estimated at 1,573,750 tons of an average value of 6.4 dwts. per ton, and these still stand in the books of the company free of cost, their development having been paid for out of past profits.

In the course of my review of the affairs of your subsidiary companies at the previous annual meeting of the corporation, I referred to the opening up of what practically constituted two new mines on the property of the Van Ryn Company, by reason of the encountering of the main reef and the south reef in No. 3 section. At that time very little work had been done in this respect, but I stated that the values disclosed by the small amount of development were very satisfactory. Since that date, further development has been accomplished, and I am pleased to say that the results obtained have been eminently encouraging, more especially on the south reef, which has hitherto been unexploited. The respective footages and average values obtained to date since development was initiated last year are as follows: main reef, payable, 1,212 feet, of an average value of 6.49 dwts. over 40 inches; main reef, low grade, 1,296 feet, of an average value of 2.42 dwts. over 41 inches; footwall leader, payable, 923 feet, of an average value of

7.27 dwts. over 36 inches; footwall leader, low grade, 195 feet, of an average value of 3.2 dwts. over 36 inches; south reef, all payable, 665 feet, of an average value of 12.41 dwts. over 38 inches.

West Rand Consolidated.

The scarcity and higher cost of native labour during the past year were severely felt by this company. Apart from the unfavourable effect on the gold producing operations of the mine by reason of the uneconomical working conditions which they induced, the shortage of natives rendered it impossible for the time being to carry out the large scope of development work intended, and which is essential to the proper exploitation of the several sections of the property in order to arrive as quickly as possible at the greatly augmented scale of milling operations we have in view, and which will be more commensurate with the exceptionally large reef-bearing area of the property. Fortunately, in the last few months the native labour complement has been considerably increased, and the effect of the additional supply of boys is already being demonstrated, not only in the improved results from milling operations but also in the extended development work now proceeding. Although the labour difficulties experienced last year precluded the carrying out in its entirety of the scheme of work previously laid down, a considerable amount of progress was made, as is apparent from the total footage effected during the period of 16,218 feet on shaft sinking and development: of this, 970 feet consisted of work of a permanent character in sinking the west shaft (of seven compartments) and the Rand shaft, but it was somewhat unfortunate that the other development footage cut did not in general give the results which were anticipated, owing chiefly to the low values disclosed in the levels driven from the east vertical shaft. Consequently the payable ore reserves at the close of the year, of 1,114,000 tons fully developed and 307,000 tons partially developed, showed a small reduction on the reserves at the end of 1910. The development effected since the beginning of the current year, however, is of a distinctly improved character, the east section giving higher and payable values in the lowest levels yet reached, and the Rand shaft (battery reef) in particular disclosing very satisfactory assays. There is a matter of decidedly interesting portent arising out of last month's work which I may take this opportunity of mentioning. At a point between 3,000 and 4,000 feet south of the Rand shaft, where a shallow pit was being excavated, an unconformable reef was encountered below the overlying black reef, which dipping at a steep angle and having all the appearance of the battery reef series, was further investigated. As the result, the manager is confident that the strike is an extension of the battery reef now being mined through the Rand shaft. This is of considerable importance as proving the continuity of this reef, and as confirming the assumption that 700 of the claims in the property would contain the battery reef in addition to the main reef series—in other words, two separate reefs, both of which are at present being profitably treated in other sections of the mine. Further prospecting operations are now being conducted on the line of the new strike, with the view of tracing the reef and also gaining additional indications as to its value.

The milling operations have given quite satisfactory results since the influx of native labour in March has permitted of more normal working conditions, especially in view of the fact that since the beginning of the year a new method of allocating underground expenditure as between mine development account and working costs has been in force, which relieves capital expenditure on the former account at the expense of the latter to the extent of at least £2,000 per month: so that the declared profit of £4,177 for March, £5,188 for April, and £6,064 for May of this year would, if the system of apportionment in vogue last year were still being continued, be well in excess of £6,200, £7,200, and £8,100 respectively. I may also explain that during last month (May) the mill was closed down for three and a half days to permit of the regrading of the launders and the enlargement of the tailings well, necessitated by the increase of the treatment capacity of the reduction works to 400,000 tons per annum.

New Steyn Estate.

There is nothing of fresh interest to record in the instance of this company for the past year. Owing to the existing depression, it has been quite impracticable to evolve any definite scheme for the supply of the necessary funds for entering upon active operations with a reasonable certainty of being able to continue them to the desired stage of gold production. It is a matter for regret that the large mining area of 1,920 claims owned by the company should continue to remain dormant for want of sufficient working capital, as there is no doubt whatever that it contains the elements of a most promising mining proposition, especially in view of its extensive claim area lying just below the ground of the whole of the Roodepoort gold mining properties, which have produced so many millions of gold during the past eighteen years. For this reason I particularly regret that the time has not yet arrived for the initiation of an active working policy. I trust, however, that before long there will be a return of confidence in the industry generally which will enable the Board to raise the additional working capital on satisfactory terms.

Rand Collieries.

As pointed out in your directors' report for the past year, a very considerable amount of development work was effected during the period, the result of which, though not so satisfactory as could be desired, disclosed a very fair percentage of payable ore. In view, however, of the company's liability to your corporation for advances made (amounting to £108,000 at the 31st December last), and the prevailing market conditions, which precluded the possibility of raising the additional funds required by an issue of further shares, it was in the early part of the present year decided to curtail active operations to some extent, and to restrict the work on hand to the sinking of the east incline shaft now going down on the plane of the reef from the No. 1 vertical shaft: this shaft will be continued into the deeper ground of the property, and will give us some idea and information as to the character of the reef likely to be met with in the lower levels when opened up at a later date. In viewing the question of the property of this company, the fact should not be lost sight of that in addition to the gold mining area of 828 claims held, there are also the coal mining rights over 5,910 acres of ground, a large proportion of which is known to contain coal measures of commercial value; these may quite possibly come into the sphere of active operations in the future—having regard to their proximity to the Witwatersrand gold fields and the possibility of several of the present sources of coal supply being exhausted in the course of the next few years.

This closes my review of the affairs of the subsidiary companies under our direction, but there are other potential mining propositions in which we are interested. The large block, equivalent to approximately 1,350 deep level claims, immediately adjoining the southern boundaries of the Bantjes Consolidated and Vogelstruis Consolidated Deep properties, is held—with the exception of a comparatively small interest in a portion of ground—entirely by your corporation, and will, in my opinion, prove to be a valuable asset at a later date. Then there is the

Beatrice Mine, Rhodesia.

This mine, situate in the Salisbury district, is now wholly the property of your corporation. The dewatering operations, to which I referred in my remarks at the previous annual meeting, occupied a more lengthy period than was then anticipated, but on their completion last year the old workings of the mine, which had yielded considerable quantities of rich ore before being shut down some years ago (prior, of course, to its acquisition by us), were resampled, and disclosed very high values in sections. We therefore decided to continue the drives in certain portions of the property which had previously yielded high grade ore, and to commence crosscuts, raises, etc., for the purpose of exploring the intervening ground and locating the approximate direction of the rich shoots indicated as being contained in the property, so that if and when a more extensive development policy were entered on, we should be able to confine the work more particularly to the sections most likely to give the best results. Having regard to the exploratory nature of these operations, it is impracticable to detail definite values for the footage already effected in this respect.

General Review.

From the foregoing remarks you will gather that the sphere of your corporation's activities is still as important as ever, and that the unfavourable money market conditions to which I have already referred constitute the only reason why the general scope of operations has not considerably increased. Apart from the temporary depreciation of assets, and the prejudicial effects of the native labour shortage experienced—both of which are matters more or less beyond our control—we have certainly not lost ground during the year under review. The considerably extended scale of mining operations for which we are at present preparing in the cases of the Cinderella Consolidated and West Rand Consolidated mines, will probably take two or three years longer to attain, but will inevitably be reached, with increasing profitable results, which must be reflected in your corporation's position and prestige. I am hopeful that the Van Ryn and Meyer and Charlton companies will at least maintain their present outputs, and that the New Goch, Roodepoort United, and Aurora West United will materially improve upon the results for the past few months. Advantage will undoubtedly be taken of the first available opportunity for obtaining the additional working capital required by the Roodepoort United and Rand Collieries for the purpose of reimbursing the advances made to these companies and for furthering the scope of their operations, and I am confident that occasion will also be taken to provide the large funds required to bring the New Steyn Estate to the production stage. Moreover, we consider that there are still possibilities of new and profitable mining business on these fields in which we may take a hand, and that the present attitude of apathy and pessimism towards any suggestion of expansion will soon be proved to have been both short-sighted and unwarranted. I do not wish for a moment to gloss over the disappointments of the past year, but I consider that it would be unworthy of my position as your chairman and a reflection on the men who have built up this huge industry in the face of repeated rebuffs, disappreciation, and periods of depression, if I were to content myself with a dull dissertation on the accounts and reports, without any explanation of the reasons for temporary setbacks, and omitting to point out in a reasonable and cheerful manner the prospects of the future.

Justifiable Optimism.

If I believe (as, fortunately, I have always done) in the immense possibilities of these fields, why should I imbue shareholders and the public with an undue feeling of pessimism by carefully avoiding any reference to a more prosperous state of affairs which I know to be well within the bounds of probability? I venture to suggest that these goldfields have not reached their present preeminent position by a studied and cautious reserve, either in words or money, on the part of the men who have made the so-called mining houses; history conclusively shows that as we all pinned our faith to their great potentialities, so we backed our opinions with our own money and inspired our financial friends and connections in Europe with our own optimism. Thus, directly and indirectly, we obtained for this country the millions of capital so urgently required and without which the Rand, and to a large extent also this unified South Africa, would have been for many generations to come a comparatively unimportant stretch of country. I do not wish to be personal, but it seems to me that it is rather late in the day for men who have materially benefited from the optimism which in the past they held and preached in season and out of season but who are now far away from the actual scene of their erstwhile labours, necessarily out of touch with the practical side of things, to criticise the men here on the spot for venturing to also adopt an optimistic vein in their annual speeches from the chair. Gold mining is, even under the exceptionally constant conditions prevailing on these fields, inevitably to some extent a speculative proposition: some properties develop considerably beyond expectations, while others suffer in the opposite direction. In any event, however, we are dealing with a long stretch of over forty miles of reef which has been proved to be on the whole distinctly payable under normal conditions of working; in reviewing what is generally termed "a going concern," one naturally endeavours to base one's view of the future on the possibilities of the property when running under ordinary conditions, and I am quite confident that it is in this light that shareholders regard, and moreover desire, our remarks. Even a maritime insurance policy excepts the intervention of "strikes, acts of God, and the King's enemies," etc., from the operation of the assured benefits! As far as I am personally concerned, without any intention of boastfulness, I may remark that some of the most prosperous mines to-day under the control of the corporation came into our hands originally as derelicts—with the reputation of inability to be worked as profitable propositions; one company has since paid £1,035,300, or 1,045 per cent. in dividends; another £609,500, or 285 per cent., and a third £1,344,500, or 282½ per cent., and all three have still long and successful "lives" before them as far as mortal man can judge. Pessimism never yet created either a man or a community, and there is certainly no room for it in South Africa, which, possessing, as it does, an unlimited area of metalliferous ground with both precious and base minerals, not to mention agricultural potentialities, requires the more satisfactory and practical proffer of the investment of a large amount of additional capital to enable it to perform its destiny.

Miners' Phthisis.

The subject of miners' phthisis is one which has come to the front in a very pronounced fashion during the last two years, more particularly since the first step in the direction of temporary legislation taken by the Union Government last year, which has been subsequently followed by proposals of a permanent nature now before the Parliament in Capetown. Some weeks ago a draft Bill, having for its object the provision of a fund for assuring benefits to underground workmen contracting the disease, was brought in by the Minister of Mines: the terms of this Bill provided for contributions to the fund by employers and workmen, in the ratio of 75 per cent. by the former and 25 per cent. by the latter, but no proposal was made on behalf of the Government as to any portion of the burden being borne by the revenues of the Union. After considerable discussion the Bill was sent to a Select Committee for consideration, and within the last few days we have gathered the general points of revision recommended by the majority of the committee, as apart from the two minority reports submitted—in the one case by three members of the committee, and in the other by the labour representative. Naturally I cannot deal with the proposed revision as a whole on an occasion of this kind and shall only refer to the leading principles thereof. It is recommended that the new Bill shall recognise two separate principles—that of compensation for cases of phthisis already contracted, and insurance in respect of future cases, which must be regarded as possible, or even probable. In relation to the compensation fund, which is intended to cover the claims of beneficiaries for the two years immediately following the date from which the Act will take effect (in other words, cases of phthisis already contracted), the workmen themselves will not be asked to make any contribution; the Government, however, is to contribute £100,000 from the bewaarplaatsen revenues, and the mining companies are to find the balance of the fund, the requirements for which will be levied upon them every three months, on the basis of the average number of underground white men employed by each representative mine over a given previous period. In reference to the insurance fund, this is to be provided, as to the first two years after the passing of the Act, by an assessment of 5 per cent. upon the wages earned by every person employed underground as a miner (of which one-half may be deducted by the mining companies from the earnings of the men in question), and subsequent to these two years by an assessment of 7½ per cent. upon the wages earned by the miners (of which one-third may be recovered from the men's wages).

Government Contribution.

The aggregate liability for the next two years under the first named (i.e., the compensation) scheme, can only of course be very approximately estimated at the present time, as it depends upon the number of claims which will be recognised by the controlling board, but if we adopt the estimates of the Government Actuary, it is likely to amount to either close upon £1,000,000 or even reach £1,400,000; in respect of this huge burden it is proposed in the majority report of the Select Committee that the Government revenues from the Transvaal shall only contribute the insignificant sum of £100,000, leaving the mining companies to provide the remainder! Gentlemen, I do not desire, nor do I think it necessary, to indulge in long arguments concerning this thoroughly inequitable division of liability; in view of the enormous amounts which the Transvaal and Union Governments have both directly or indirectly obtained from the gold mining industry over a long period of years, and the undoubted benefits which the South African community (both inland and coast), have, as a whole, experienced from the commercial requirements of the mines, I consider that we have every justification for asking that the Union revenue (call them the Transvaal revenues if you like!) should contribute pari passu with the mining companies to the compensation fund. I agree with the minority report (of three) that the proposed provision in this respect of £100,000 is quite inadequate, only I should prefer to term it hopelessly inadequate. The Government have already established an excellent precedent by reason of the Bill which was passed last year, providing an amount of £50,000 (contributed in equal shares by the Government and the mines) for urgent cases, and I think this should be followed up by a similar basis of partition in the instance of the new Act. I wonder if the generality of people in this country at all realise the importance of maintaining the gold mining industry as a prosperous business proposition? They cheerfully acquiesce in the continual heaping of fresh burdens on the mines, quite oblivious apparently of the warning conveyed in the old nursery story as to killing the goose that laid the golden eggs. And yet the great majority of the mines to-day are low grade, requiring very intelligent working and economical management in order to return a reasonable percentage of profit on the actual working capital invested. As matters stand at present, the mining industry represents by far the most important factor in the prosperity of South Africa, and if it be seriously crippled, by whatever cause, it will bring such a state of financial ruin on the whole of the Union as will take generations to recover—if ever. Take a couple of cases of unsolicited evidence in this connection, given by men who cannot be accused of wishing to bolster up the arguments of the mining houses. It is only a little over a year ago that the Minister of Finance, in introducing his budget, stated that the greater portion of the revenue of the Union was provided either directly or indirectly by the mining industry. Again, I notice that a few weeks ago the President, in his address at the annual meeting of the Capetown Chamber of Commerce, stated that the exports showed an increase of almost 3½ million pounds, or about 6.4 per cent. as compared with the previous year, and that this increase was produced entirely by minerals—in fact there was a slight falling off in the total value of the exports of agricultural produce. He went on to say: "One outstanding feature of the export trade was the preponderance of minerals, which amounted to 81.8 per cent. That was not a satisfactory position for South Africa. It was not satisfactory that our national expenditure and national liabilities should be based on what after all was a diminishing asset, hence the imperative necessity of increasing the products of the land."

The expression of regret I do not propose to discuss, but I would earnestly request our many critics and opponents in this country to quietly reflect for a little space upon the appalling consequences which would follow any appreciable permanent diminution of the existing activity of the mines—the far-reaching effect upon the Union revenues and upon the community generally—and to abandon the thoughtless and short-sighted idea that this industry can bear unlimited taxation and burdens, excessive restrictive regulations and still continue to be a successful commercial enterprise. To these people I would say that the European shareholder who has invested his money in this country is just as much entitled to ask for reasonable treatment and a return on his capital as the man born and bred in this country; but leaving this phase of the question alone for the moment, cannot the South African judge the position from the mere practical point of view of his own pocket? There is quite a large number of mines on these fields on which, taken as a whole, many millions of money have been spent in equipment and development, but which to-day are making profits so small as not to allow of any dividend to shareholders. Yet each of these mines is paying out anything from £200,000 to £500,000 per annum in wages, stores, printing and stationery, salaries, and general expenses, nearly the whole of which is being spent in this country and circulates through all sorts of channels for the benefit of the general public. In the event of these mines being shut down because the narrow margin between profit and loss has disappeared, who will make good the loss of wages and trade? And who will bear the additional taxation rendered necessary by reason of the decrease in the number of persons contributing to the revenue of the country owing to the throwing out of employment not only of the workmen and staffs, but also the tradespeople and others dependent on the custom of these employes?

Labour.

At last year's annual meeting of your company I referred at some length to the increased cost of wages and capitation fees in respect of native labour, in consequence of the absurd competition existing between the mining houses inter se, and again between the mines themselves and the contractors who were supplying them with underground labour; and I pointed out that no compensating benefit had been obtained for the additional cost, such as more efficient work or a large accession to the native supply. The year which has since elapsed has more than confirmed this view. At the annual meeting of almost every mining company held in the current year, the chairman has mentioned the prejudicial effect of the shortage of native labour on the operations of the company in question for the period under review—although, as a matter of fact, the cost of this class of labour (both as regards wages and recruiting) has, if anything, been higher than before. I am credibly informed that, taking the best recruiting month in each year for the last three years as a guide, the maximum number of natives employed on these fields has been approximately the same for each year: why, then, the necessity for all this additional expense for obtaining the labour and the appreciably increased standard of native pay?—unless it be argued that only a proportion of the these boys would otherwise have been available for work on the mines, which is a distinctly far-fetched contention! During the last year many meetings of the representatives of the respective mining houses have been held with the object of arriving, if possible, at a general agreement to amalgamate the several group labour organisations and in future to pool the recruited labour on the same lines as the Witwatersrand Native Labour Association, thus putting an end to the present suicidal competition, but so far no finality has been obtained, and I am now extremely doubtful as to any satisfactory arrangement being come to. As far as this group is concerned, I may candidly state that if the proposed amalgamation were to be carried into effect, we should at the outset lose both in pocket and in boys to some extent, as our organisation supplies our mines with a higher percentage of boys at a lower cost than several of the other group organisations have been able to attain vis-a-vis the mines under their control. But in view of the benefits which must eventually accrue to all the groups concerned by a cessation of the present competition, we were prepared to make some sacrifice for the sake of the general principle. I regret to say, however, that the impressions I have gathered from certain proposals put forward at the recent meetings of the groups do not lead me to take a cheerful view of the prospects of a satisfactory settlement of the question.

I have already referred, in my previous remarks to-day, to the difficulties experienced during the past year by most of the mines of our group as the consequence of insufficient native labour. I am therefore all the more pleased to be able to point to the greatly improved results which the recent accession, in March and April last, to our native labour supply has made possible. Taking the seven producing mines under our control as one unit, the working profit for the first quarter of the current year was equivalent to a monthly average of £57,787; whereas for April (when the effect of the increased number of boys was already being felt) the group profit amounted to £60,494, and for last month (May) was still higher at £67,968—the latter figure being the highest monthly profit for our group for nearly three years. To further illustrate the advantage of a plentiful supply of labour, the development footage for the seven mines for the first three months of this year averaged 7,800 feet per month, as compared with 8,858 feet effected in April and 9,170 feet last month. As regards the immediate outlook, I think I may say this is comparatively favourable: we have to-day on the mines under the control of your corporation about 1,400 native labourers in excess of the number employed at the corresponding date of last year, and as the general tendency for boys to come forward to the Rand seems to be growing, I see no reason why the advance which we have gained should not be maintained. Before leaving the subject of native labour I may perhaps point out that the more boys there are available for the mines, the more we shall be able to substitute hand-drilling for machine drills: apart from the more economical working conditions which hand-stoping permits in the great majority of the mines, there is the further aspect that it entails the creation of less dust underground, and would therefore tend to restrict the ravages of miners' phthisis to some extent.

Estates Duty.

During the present session of the Union Parliament, a Draft Bill was introduced by the Minister of Finance having for its object the standardisation of Death Duties throughout the respective Provinces comprising the Union of South Africa, and in the progress of the Bill through Parliament an amendment was tabled by the Minister of the Interior to the following effect: That a special duty of ¼ per cent. per annum be levied on the value of warrants for share capital, debentures or debenture stocks issued to bearer and registered outside the Union upon which any interest, dividend, or bonus is paid. This amendment was admittedly intended to include in the net of South African taxation the wealthy man who might endeavour to evade the death duties by transferring his holdings in South African securities to some nominal limited liability company domiciled in Europe, for an equivalent interest of shares in the latter. The objectionable feature of the proposal lines in the certainty that a very considerable number of bona fide European investors who—especially on the Continent where the practice is general—hold bearer shares and debenture bonds to bearer, would be severely penalised, without any justification, for the doubtful advantage to the Government of possibly catching out a few artful dodgers amongst the moneyed men. The impression produced by the new principles of the Bill on the feelings of European investors towards South African securities, and the question which is raised in the minds of many of them as to the goodwill of the Union Government towards the mining industry, provoked such a serious outcry that it necessitated the urgent representations to the Union Government of many of the leading banking and financial houses, not only in London, but on the Continent also, as to the adverse effect which the ratification of the amendment by Parliament would certainly have on the prospects of the investment of further European capital in this country. What course the Government intend to adopt in this matter is entirely beyond my cognisance, but I would like to take this public opportunity of conveying to them my friendly but earnest advice that they should pause—not once, but twice, and even three times—before risking the closing of outside capital to this country for an indefinite period for the sake of obtaining their undeniably just toll from the estates of those few men who, having made their money in this country, might be sufficiently mean to attempt to wriggle out of their common obligations towards it. Because I know these two things full well—that all the capital that could possibly be attracted to this country under the most hopeful conditions is required and can be utilised to the last farthing in reproductive development of its resources, and that, on the other hand, several of the big banking houses, who have for years past invested large sums of money in South African securities, are seriously contemplating the withdrawal of their support and turning their attention in other directions where they consider the investment of their capital will meet with more considerate treatment from the powers that be. And I may perhaps quote an instance in point as to the probable effect of apparently unfriendly legislation towards South African enterprises.

Victoria Falls Power.

A few weeks ago the Victoria Falls Power Supply Company invited subscriptions to the issue of one million pounds of debentures of the company bearing the very fair rate of interest of 5½ per cent. per annum, the proceeds to be utilised in the expansion of the equipment and operations of the company's present extensive business: largely as a consequence of the feeling of doubt engendered by the disposition (so regarded in Europe) of the Union Government to unduly tax Transvaal industries, the issue was received by the financial houses and the investing public oversea with disfavour. I am informed from London sources that the guarantors have had to take up practically the whole of the debentures.

Rand Water Board.

For some time past, and especially in view of the difficulties experienced during the latter half of last year in meeting the full demands for water by the Municipalities and mines within the area of the Board's sphere of operations, it has been felt that the existing sources of supply may prove to be inadequate for the increasing requirements of the constituted authorities of the Board. Consequently the chief engineer to the Board was directed to investigate and report upon the various catchment areas situate within a reasonable distance of the Rand, for the purpose of enabling the Board to consider the probable cost (both capital expenditure and cost of water supply per 1,000 gallons) of the alternative schemes for supplementing the present available supply. The engineer's report has now been handed in and circulated amongst the members of the Board. Which of, or whether any of, the schemes put forward will be finally approved, is a matter yet to be decided. In the meantime, however, I notice a disposition on the part of some of the members representing municipal interests to query the desirability or necessity, from their point of view, for any large addition to the existing sources which would involve a considerable expenditure of capital and the creation of a new loan. Their argument appears to be that the Board's present undertakings can be relied on to always give sufficient water for domestic and health requirements (which receive a preference under the Board's ordinances), and that therefore the Municipalities should not be called on to contribute any portion of the standing charges in respect of new undertakings. To follow up this suggestion, and assuming that there occurred a period of drought in this country (quite a likely possibility), it might easily be that the demands of the Municipalities for domestic and health requirements would take up the whole of the Board's water supply from present sources, leaving nothing at all for the mines; why, then, should the mines be asked in equity to pay half the standing charges of the existing loan for an insurance which is not even assured? That is one point. But to go further and assume, per contra, that a new scheme for additional sources of supply be agreed on; presumably the standing charges of the new loan would have to be met, as at present, by the mines and Municipalities in equal proportions. It might be the case that from the combined sources of supply (the old and the new) the mines would take in the future a larger proportion of water, through their increased requirements, than the Municipalities could consume, and this seems to stick in the minds of some of the municipal representatives on the Board as inequitable. It is not by any means a certainty that such a position would arise, but even if it did, is there not a much larger factor at the back of the whole business? Supposing the Board as a whole were to decide against increasing the present undertakings by any new catchment area scheme, and supposing also that we are visited with a drought of some duration (perhaps for two or three years, as has been experienced before), and as a natural consequence a large proportion of the batteries along the Reef are shut down for want of water. Undoubtedly the mines will suffer financially for the time being, but does it not also follow that the Municipalities will be financially affected to a like or even greater degree? If a large number of men be thrown out of employment, their spending power will cease, and the effect will be felt by tradesmen and stores all along the Reef and in the towns also. Scarcity of water for the mines will be accompanied by scarcity of money for the general community. The idea so very prevalent of regarding the mines as something apart from or even hostile to the general public of the Witwatersrand is a matter that I have never been able to understand. As a community we here are all bound up with the gold industry—we are all equally dependent on it whether we are directly attached to the mines or whether we are serving other occupations outside. If the mines go under, then, under present conditions, the Municipalities must go also. What would be the real value of the huge land and building property comprised in the Johannesburg municipal area if the mines ceased to exist, or even if their operations were seriously curtailed for any length of time? These are questions which I commend to the thoughtful consideration of the community in general and their municipal representatives in particular.

Complex Problems.

Before bringing my remarks to a conclusion, I wish to say that my apology for the length of them must lie in the many complex problems which face us here, and which are probably without a parallel in the case of a large industry in any other portion of the British Dominions. As a consequence there are several other questions which I have omitted to allude to, recognising as I do that there must be limits to the patience of shareholders. Though nowadays I make a practice of studiously avoiding any reference whatever to politics at a business meeting of this nature, yet I am conscious that some of the remarks which I have made to-day may bear that interpretation. The position of men like myself, in giving an annual address to the shareholders of a "mining house," is that it is our duty to review the affairs of the mining industry as fully as possible, and because this industry is the main factor in the progress and prosperity of the Transvaal—and to some extent of other portions of South Africa also—nearly all the more important legislative measures brought before the Union Parliament affect us in greater or less degree, and therefore require a reference in our speeches. We have not only to keep a constant and watchful eye on the actual operations of the properties under our direction, but we must also do our utmost to safeguard the interests of our shareholders from legislation which, with sometimes the best of intentions on the part of the authors, may bear too hardly on the mining industry. So long as the mines constitute the chief revenue-producing source for the Union, so long will it be necessary for us to see that the natural inclination of less important centres to saddle us with the cost of every additional requirement in the way of taxation for the Union shall be equitably apportioned. We have no desire to refuse to bear our due proportion of the liabilities or ordinary expenditure of the country, but we do most emphatically object to being regarded as a community who will cheerfully acquiesce in the imposition of burdens which should rightly be borne by other parts of South Africa which will reap the benefits of the outlay.

Mining the Milch-Cow.

We regard ourselves as a not unimportant part of the Union of South Africa, but we do not think it incumbent on us to act as a milch cow to the rest of the dominion when the question arises (as it continually does) of the easiest methods of allocating the particular direction in which the money is to be obtained. This industry must be carefully guarded, not only in the interests of shareholders, but also for the sake of the Union itself. If you strain it to a breaking point, what becomes of South Africa as a whole? What other alternative is there at present for the prosperity of the Transvaal, the additional trade of the Coast ports, through imports of mining requirements, and the millions of pounds which to-day circulate through the inland traders of the Cape Colony from the earnings of our mine natives, and which accrue to the South African Railways from all kinds of sources emanating from the mines? Will agriculture fill the place—agriculture which has been fostered to a large extent by the revenue directly and indirectly obtained from the mining industry, and which is still and must be for many years to come dependent on it in some degree? No, our industry has long ago passed beyond the experimental stage when it was popularly supposed to exist for the purpose of allowing a few rich men to become still richer. It is to-day the mainstay of the Union of South Africa, and until some other equally vital factor can be found to take its place it would be wiser for people to recognise the obvious conclusion that it is better to encourage the prosperity of the greatest gold and diamond fields in the world than to place every conceivable impediment in the way of their success—a success which contributes to the welfare of the whole country.

I have much pleasure in recording, on behalf of your board, our recognition of the services rendered during the past year by the various officials and staff, financial and technical, of your corporation in Johannesburg, London, Berlin, and Paris.

The report and accounts were adopted.

The retiring directors, General Konsul Albert Blaschke and Geh. Regierungsrat S. Samuel, were re-elected. Mr. Franz Urbig, partner and director of the Disconto Gesellshaft, Berlin, was elected a director in place of Dr. Arthur Salomonsohn, resigned.

The auditors, Mr. T. Douglas, of Johannesburg, and Messrs. W. S. Ogle and Co., in London, were reappointed. A sum of two hundred and fifty guineas was voted to Mr. Douglas and a sum of one hundred and fifty pounds to Messrs. Ogle and Co., in remuneration for the past audit.

JOHANNESBURG ESTATE CO.

Annual Meeting.

The annual meeting of the Johannesburg Estate Co., Ltd., was held at the company's offices, in Old Exchange Buildings, on June 13, Mr. Charles Marx being in the chair. Among those present were Messrs. H. A. Gogers, J. Munro, H. O. Mascall, Max Honnet, P. Richardson, A. Storm, F. R. Caithness, G. H. Langdale and Frank Hilner (secretary).

The Chairman's Speech.

The Chairman, in moving the adoption of the reports and accounts, said: The report, balance sheet and profit and loss account, covering the period from the 1st of April, 1911, to the 31st of March, 1912, is in your possession, and as it deals very fully with the position of your company there is but very little I can add in the way of comment. The revenue and expenditure for the past year show very little variation, and the profit is practically similar to that of the previous year. The same can be said of the financial position of your company. This remains a strong one, and the cash balances are almost identical with those of the year before. When addressing you at our last annual meeting I mentioned to you the wretched condition of the building known as the Old Stock Exchange, and foreshadowed that the premises would have to be reconstructed, with the exception of the hall formerly used as the Stock Exchange. Your board gave this matter a great deal of consideration during the year, and various plans were submitted. The conclusion arrived at by the directors was that in order to make a good building and one that would be a real improvement, would require a complete alteration of the hall also. It was decided to turn the hall into a first-class theatre, such as will command a good rental. Plans and specifications are ready, and tenders for the reconstruction and erection of the new premises are about to be called for, and your board is confident that the new building will readily let and produce a much-increased revenue.

The report and accounts were adopted.

Messrs. C. L. Andersson and Henry Hains were re-elected auditors and their remuneration fixed at fifty guineas each.

A dividend of 2½ per cent. was declared to all shareholders registered on the 15th of July, to be paid on or about the 2nd of September.

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Notes and News.

Additional Mine Inspectors.

At the opening of his valedictory address as Honorary President of the South African Institution of Engineers last Saturday night, Mr. R. N. Kotzé, the Government Mining Engineer, stated that it was impossible for him, owing to the rules of the Civil Service, to accept the challenge of this paper to reply to the attack made by Mr. Merriman on his department. Mr. Kotzé is, of course, the best judge of what he may do in the matter, but the public will regret that Mr. Merriman's strictures should have to go unanswered. During the week, a vote was passed for four additional inspectors for the Mines Department; and the detailed evidence given before the recent Select Committee on the Miners' Phthisis Bill shows that there was a remarkable unanimity on the part of the representatives of the mine employers and employees regarding the inadequacy of the present inspection.

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A Blasting Innovation.

In the course of his evidence before the Select Committee on the Phthisis Bill, at Capetown recently, Mr. R. W. Schumacher made an important reference to the subject of blasting. He said: "We are discussing the question with our engineers now. We have considered it very carefully, and what we have in mind is that the blasting should take place when there are no men in the mine. There has been an undue amount of accidents in the mine owing to the blasting, and it is perhaps a little premature for me to say this, but we are considering whether we cannot have expert gangs of blasters who would go in when all the other men had gone out of the mine, and do all the blasting, so that the comparatively inexperienced miner will have nothing to do with blasting. Accidents will not occur, when men are out of the mine, both white and black. That is a great thing. We hope it would be possible to turn on the sprays during the off shift, and so the whole of the dust could be allayed. That is what we have in our minds."

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First-Aid Certificates and Estate Duty.

At the monthly meeting of the Chamber of Mines on Tuesday, Mr. M. G. Elkan, who was in the Chair, dealt with two important matters not mentioned in the monthly report. The first one related to the Mines and Works Act, 1911, Regulation 277, sub-section 3, which lays down that from the 1st January, 1913, certain classes of mine officials will be required to possess ambulance certificates. A Sub-Committee of the Executive of the Chamber of Mines has this matter under consideration for the purpose of ascertaining what facilities can be made available for the necessary qualification of these officials. The second matter not mentioned in the report is the Estate Duties Bill, to which the President made a lengthy reference at last month's meeting, and about which the Chamber made very strong representations to the Government. Since the report was issued, namely, on the 13th instant, Mr. Elkan called attention to the fact that the Prime Minister had stated in the House of Assembly that this Bill would not be proceeded with.

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The Labour Position.

The native labour supply is following its usual mid-winter course. The number of natives employed by the members of the Witwatersrand Native Labour Association, together with contractors' natives, but excluding, as usual, those employed by members in the district of Barberton, at Breyton and Rooiberg, showed at the end of May, as compared with the end of April, a decrease of 4,108 for the gold mines, while as regards the collieries there was an increase of 96, and in the case of the Premier Diamond Mine an improvement of 753. Taken collectively, the decrease for the month of May was 3,259, which compares with a decrease of 3,915 for the corresponding month of last year. Dealing with the subject at the monthly meeting of the

Chamber of Mines on Thursday, the Chairman, Mr. Elkan, said: "As has been pointed out on previous occasions, a decline at this time of the year must be anticipated. In the ordinary course of events, the current month is likely to show a further decrease—an experience which we invariably have to face during the winter months."

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Mr. Schumacher on the "Square Deal."

At the Cornish dinner to-night, we understand that Mr. R. W. Schumacher will make an important speech developing his views on the question of housing miners on the Rand. Already the City Deep scheme gives promise of being crowned with success, and its extension to other mines is eagerly awaited.

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Bloemhof Activity.

Northern Minerals (Transvaal), Ltd., owners of Commissie Rust, are a subsidiary of Northern Transvaal Lands, Limited. The Chairman, Mr. E. W. Cox-Moore, a director of several South African companies, is on his way out, and will decide future plans. On Commissie Rust during the past few weeks, from three trial washes of 200 loads each, twenty-four carats were recovered, valued at £190. On the adjoining farm, Diamondfontein, of 13 prospecting washes, 11 have returned diamonds. The last 100 loads gave a return of stones valued at £26. Prospecting is being vigorously continued. Plenty of water is available. It is thought probable that a fissure exists on the Commissie Rust property.

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Randfontein Affairs.

The London papers contain an interesting account of an interview with Sir Joseph Robinson, regarding Randfontein affairs. Sir Joseph is quoted as saying that the reorganisation now being carried out is really in connection with some of the stopes, which, in the past, had been carried too wide, and that the same are now being narrowed as much as possible. Another system of working is also being introduced into the working of the mines, and these changes should remove the present discrepancy between the assay value of the ore reserves and the recovery per ton. Sir Joseph denies that the grade of ore is deteriorating, and also states that there is a superfluity of labour, instead of a shortage. He anticipates a good return for May, viz., a profit of about £70,000, and fervently trusts that a dividend will be paid this year, and, in the meantime, the monthly profits are being utilised to wipe out the company's indebtedness. Upon the whole, therefore, the position on the Randfontein Central may be considered as hopeful, and Sir Joseph adds that the Randfontein Estates debt will be satisfied by an allotment of shares.

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Sir Joseph Robinson and the "S.A. Mining Journal."

Owing to the contradictory nature of statements concerning Randfontein Central matters in letters appearing in its columns on Tuesday in mail week, the *Financial News* asked Sir Joseph Robinson, over the telephone, whether he had seen the letter containing them. He replied in the affirmative, and was asked whether he wished to make any reply to it. Sir Joseph replied: "It is a pity that men who sign themselves as shareholders do not give their names, as I know for a fact that many such letters are written about Randfontein matters by men who do not hold a single share in the company. A large number of these letters are written with a motive which we quite understand." Asked as to what he took exception to, Sir Joseph replied: "The statement he makes is that at a meeting on January 24th, 1912, I had it reported that the company had arranged for a supply of natives to operate 1,000 stamps, and in March, 1912, he finds that I again stated there was an excess of 5,000 natives and only 600 stamps. The assertion that I had it reported that we had arranged for a supply of natives sufficient to operate 1,000 stamps is absolutely untrue. The statement was made in a speech by Mr. Langerman at the annual meeting on January 24th, 1912; but I did not arrive on the Rand before the beginning of March, and I knew nothing of the position of affairs at the company or the actual arrangement which had been made about native labour until after my arrival. It was then that I investigated matters and found there were 5,000 natives too many, as well as 200 white men. I set to work at once to rectify these things. As regards the number of stamps, when the machinery was ordered for the northern section of the Central Company the 600 stamps were erected and tube mills for another 300 stamps—that is, the equivalent of 900 stamps. This number of stamps is still the same, and has never been changed, and on referring to past circulars of the company it will be seen that the number given by me is quite correct." Sir Joseph was then asked: "Have you any observations to make concerning the extract from the *South African Mining Journal?*" He answered: "With reference to the statement of the *South African Mining Journal* that the March profit had considerably decreased and that it amounted to only about £53,000, that is the very reason why I took matters in hand and brought about the changes in the organisation and readjustment of the mines. These came into operation on April 1, and I have already explained, in my interview with your paper, the difficulties which were encountered during that month. It was one day short. Then there were the accidents at the Robinson wheel and the South shaft. The Easter holidays also fell during the month of April, besides which we had to pay off a number of white men who had been discharged from the company's service. Yet the profit was over £58,000 for the month. The return for the month of May will show the result of the action I have taken in reorganising the working of the mine, and will, no doubt, be duly appreciated."

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Cost of Competitive Recruiting.

On the question of competitive labour recruiting, Mr. Schumacher made an important statement in the course of his evidence given before the Select Committee on the Phthisis Bill at Capetown. He replied to a speech made by Mr. Malan on the subject in the House on April 15, in which the Minister quoted the chairman of a Witwatersrand company as saying: "The total cost to the Witwatersrand mines for native labour in 1911 was probably £1,200,000 higher than would have been the case if the rate which obtained in the first part of 1909 had been maintained, and of this huge sum, £1,000,000 might be attributed to avoidable competition." If that was so, continued Mr. Malan, "perhaps the additional burden, which would undoubtedly be laid on the industry by the Phthisis Bill would not be felt to the full extent." Mr. Schumacher endeavoured to make it clear to the Committee that the keen, and in many ways undesirable, competition that existed in regard to recruiting labour in the Cape Colony for the Witwatersrand, and the higher wages that resulted were due in a considerable measure to the attitude of the Government itself. Last year Parliament passed a Native Labour Regulation Act which permits professional contractors to recruit labourers at one rate of wage, hire them out at whatever higher rate they can obtain, and make a profit of the difference. The Chamber of Mines most strongly objected to this principle of the Government allowing the farming of labour, but its recommendations were not accepted, it being held, apparently, that competition was desirable and that the increased wages likely to ensue would be a benefit to the population. "All I have got to say in regard to this point," said Mr. Schumacher, "is that the Government cannot have it both ways. They cannot wish to encourage and ensure higher wages and competition, and then blame us because our wages are higher owing to this very competition."

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Accident Statistics.

As we go to press, we have received a letter from a correspondent signing himself "Veritas," who writes:—"In your last and in previous issues you have tried to belittle the value of statistics of fatal mining accidents compiled by Mr. Leyds, Librarian, Mines Department, and others. Well, I am surprised, not at the large percentage in the Transvaal, but at the fact that fatal mining accidents are not more numerous here, as the workmen are for the greater part raw natives, i.e., unskilled, untrained and clumsy workmen, whilst the white workmen are also known to be rather careless. It is, in my opinion, a miracle that there are still countries or mining districts with a larger percentage than the Transvaal or Rand. But our percentage is truly high; you cannot truthfully deny that. Another correction: If you will look through the quarterly or annual reports of Germany, France, India, Egypt, Italy, Netherlands, Austria (including Bohemia), British Columbia, Canada, British Guiana, Belgium, etc., you will see that you and Mr. S. Evans (in whom you seem to believe with an unscientific belief) were wrong in stating that the Panama Canal Co. (whose returns of deaths from tropical diseases are classed with 'accidents') is the "only institution approaching the Rand in accuracy of their statistical methods.' If you would go to the Mines Department Library, Mr. Leyds would no doubt be willing to show you all the aforementioned reports, etc." Despite this, we still dispute the accuracy of the comparisons made by Mr. Leyds, but we have not space here to recapitulate the arguments we gave for that belief in previous issues.

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Lonely Reef Gold Mining Co.

The record of last year's operations at the Lonely furnished Mr. C. F. Rowsell, the chairman of this company, with a very good theme on which to discourse at the annual meeting, held in mail week. The total net profit amounted to £38,336, as against £20,066 for the year 1910. Satisfactory as this improvement is, however, it falls short of what the management had anticipated. Mr. Rowsell enumerated the various difficulties that have had to be faced and overcome—first, the difficulty of transport owing to an outbreak of cattle disease; secondly, a difficulty in connection with the treatment of the ore, it being found necessary to crush the ore to a finer degree than the test crushings indicated; and, thirdly, a breakdown of one of the tube mills. It is confidently expected, however, that the full output of 4,000 tons a month will soon be realised. The mine is responding to development in a splendid manner, and the ore reserves are estimated at 148,738 tons, containing a profit value of £487,376. A dividend of 10 per cent. on account of the current year has been declared.

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Rhodesia G.M. and Investment Co.

Mr. C. F. Rowsell, the Chairman of the Rhodesia Gold Mining and Investment Company, stated at the annual meeting that there is every prospect of the company earning very considerable profits in the not distant future. The main objective of the company was to become a parent undertaking, and its first achievement in this respect was the flotation of the Lonely Reef Gold Mining Co., which paid its initial interim dividend of 10 per cent. in December last, and recently distributed a second interim dividend of like amount. The Rhodesia Gold Mining and Investment Co.'s holding in the Lonely Reef at December 31 last amounted to 35,796 shares, so that its income from this source alone must be quite considerable. But in addition to that, the company has formed the Sabi Gold Mining Co., in which it has 49,893 shares, and a further 130,000 shares to be received on completion of the transfer of the property, which has been delayed owing to a dispute with the Government in regard to the transfer duty payable. This will make the parent company's interest in the Sabi Gold Mining Co. 179,893 shares, or equal to about 72 per cent. of the total capital. Furthermore, the Rhodesia Gold Mining and Investment Co.'s interest in the Cam and Motor Gold Mining Co. at December 31 last was represented by 43,000 shares. Its other interests consist of 14,909 shares in the Hay Gold Mining Co., and 4,500 shares in the United Rhodesia Goldfields. Taking these shareholdings at their market values at the date to which the accounts are made up (exclusive of the Sabi shares, which have not yet received a quotation), they amount to £195,176, and reckoning the 49,893 Sabi shares at their par value, makes a total of £245,069, which is £93,462 in excess of the amount at which these investments stand in the accounts. But, in addition to this very large unrealised profit, the company had at December 31 last liquid cash assets, in excess of liabilities, amounting to £45,554.

TOPICS OF THE WEEK.

THE FRAMING OF THE PHTHISIS BILL

From the voluminous Blue-book containing the evidence given before the Select Committee on the Phthisis Bill, two facts emerge. One is the extraordinarily shortsighted action of the Labour representatives in refusing to join forces with the Opposition in keeping the Government up to its promise to contribute half the Compensation Fund; and the other is the unequal nature of the uphill fight made by Mr. F. D. P. Chaplin to make the Bill a fair and practicable measure. Mr. Chaplin's efforts were, of course, enormously strengthened by the evidence of Mr. R. W. Schumacher, who appears to have convinced even the redoubtable Mr. J. X. Merriman of the injustice of the proposals of the Government. Mr. E. J. Way—whose statement we quote elsewhere—Mr. R. A. Barry, of the Nourse Mines, and Messrs. McGregor and McArthur Johnston, of the Consolidated Gold Fields, lent Mr. Schumacher material aid, and great credit is due to all these gentlemen for coming forward at very short notice to aid Parliament in devising a sound and workable scheme. That Mr. Chaplin was able. by securing the assistance of Mr. Merriman, to squeeze an annual contribution of £100,000 out of the Government is greatly to his credit, though there are other less showy but equally important improvements in the Bill which are due to the unwearying persistency of his efforts. An important point brought out in the evidence is the practical unanimity of all the expert witnesses on the probability of the early eradication of the disease. The thoroughly practical nature of the recommendations of the Phthisis Prevention Committee, the appointment of more inspectors and the expressed determination of the Government and the mine managers to hasten reform—are all good augnries of success. Of the Bill itself, in its final form, it is still premature to speak. But it may be said at once that though it might in several ways be better, it might also in many respects be worse. Dealing with it on Thursday from the Chamber of Mines standpoint, Mr. M. G. Elkan, who presided at the monthly meeting, gave the measure his guarded approval. As advocated by the Chamber, the Bill now establishes two funds for the compensation of sufferers from miners' phthisis. The first, called the Compensation Fund, makes provision for all cases arising during the first two years after the coming into force of the Act. The second, called the Insurance Fund, is to provide for all claims made after the expiration of that period. The whole of the liability for existing cases is imposed on the employers, except for the contribution by the Government of £100,000, which is to be allocated in assisting the poorer mines. As soon as the Act comes into force contributions to the second or Insurance Fund are to be made. In respect of every white person employed underground as a miner, every employer must pay to this fund during the first two years an amount equal to 5 per cent. of the earnings of such person during the previous month, and thereafter an amount equal to 7½ per cent. of such earnings. The employer is allowed to deduct from the earnings of every such person 2½ per cent. of the wages. Sufferers from the disease are divided into two classes. The first consists of those whose health is not seriously or permanently impaired. They are to receive £8 per month for a period not exceeding one year. The second class will consist of the more severe cases, and such sufferers are to receive monthly payments of £8, not exceeding in the aggregate £400. Dependents of a deceased miner are to be entitled to such monthly payments as the Board may decide, but such sum shall not exceed in the aggregate the difference between the maximum amount which the miner would have received had he been alive and the sum already paid to such deceased miner. Mr. Elkan, speaking on behalf of the industry, sums up on the Bill as follows: "As the result of the amendments introduced by the Select Committee, the Bill is a much more workable measure. Since the issue of the Committee's report, however, the amended Bill has been discussed in the House of Assembly and a number of further amendments, involving various alterations of importance, have been introduced. At present the measure is before the Senate, where still more modifications are being effected, and consequently I am not in a position to review the Bill in its final form. The Chamber quite recently has submitted further suggestions to the Minister who is in charge of the Bill; these aim at yet further facilitating the working of the Bill after it has become law." And there, for the moment, the much-debated matter rests. It is not too late, we hope, for the Government to make the desired few finishing touches that, in the opinion of those chiefly concerned under the Bill, are still necessary to make it a workable measure satisfactory to all parties.

HEALTH, EFFICIENCY, AND THE MINERS' WAGE.

As the result of the increased efforts to improve health conditions on the mines, a silent revolution in the wage-system in vogue has lately been taking place on the Rand. The contract system is passing, and its place is being taken to an increasing degree by the day's pay *cum* bonus system. Some of the mines, of course, have for years employed this system, but only of late has its adoption begun to spread. The change, it may easily be shown, is bound to be attended by most satisfactory results—not only in the direction of increased efficiency but also in that of stricter observance of the rules relating to the protection of health underground. The change means that not only is the era of the "big cheque" drawing to an end, but that the sway of the "coming-out-in-debt" spectre is likewise about to cease. That the miner still goes in fear of the latter contingency may be news to many, but cases were quoted before the Select Committee on the Phthisis Bill to prove that anxiety under this head is not unreasonable. The Labour representatives who gave evidence before the Select Committee submitted eight costs sheets that had come under notice quite recently. Number 1 consisted of two men who worked 18 and 19 shifts respectively. Their total cheque was £4 11s. 3d., that is for developing, and their average rate of wages per shift was 2s. 6d., or 1s. 3d. each. Number 2 cost sheet included one man only who worked 19 shifts and came out £2 3s. 3d. in debt. He made nothing for his work. No. 3 sheet included one man at the New Kleinfontein, who worked 19 shifts and came out £21 13s. in debt. No. 4 was two men at the Geldenhuis, who worked 21 and 1 shift respectively, and who made an average of 12s. 6d. per shift. No. 5 included one man at the Randfontein Central and he averaged 13s. 11d. per shift. No. 6 included two men at the same mine, and they came out at £2 8s. 4d. in debt. No. 7 which came from the New Kleinfontein has six shifts, which worked out at an average of 6s. 11d. per shift. No. 8 was that of two men at the Randfontein, who did 21 and 24 shifts respectively, that was 45 in the month, and they came out in debt to the extent of £13 0s. 11d., and these two had been made up to 12s. 6d. per shift. Of course these were mostly machine men. That the contract system militates against the due observance of the health regulations was made abundantly clear by the Labour representatives, Messrs. Moon and Trewick, in the course of their evidence, and the obvious deduction—though they did not make it—is that all the efforts of the managements and Government Inspectors to combat phthisis will be hindered as long as the contract system continues. The cessation of the system means, of course, that many of the best men will leave the mines enforcing the change, but that must be accepted as the lesser of two evils. That the day's pay *cum* bonus system of wages is the most scientific has long ago been established, and now that it has health considerations also on its side, the case for its adoption seems overwhelming. Indeed the surprising thing is that the change has not been made sooner. It is extraordinary that the Rand, which has learned from America so much, should be so slow to profit by the experience of that country in the one great industrial question which America has studied to most purpose. It pays to study the purchase of labour, and the knowledge of that fact America has long turned to account. The ingenuity of the American engineer has discovered the *via media*, the happy medium between the demands of labour and capital, in the compromise between day's pay and contract. That compromise is the premium or bonus system. Its advantages are many and obvious, and of an all round nature. The miner benefits from it because his earnings are augmented if his effort is increased, without making the former so great as to excite the fear of cutting. Moreover, he is assured a minimum wage in any event, and is, as a rule, guaranteed against "cutting" in any shape or form. The manager benefits from the fact that the premium system results in profit returns most nearly approaching those of the day-pay ideal; the returns are acceptable to miners, and avoid the necessity of rate change in case of over-liberal allowance in the first instance. For the shareholder the system is beneficial, since it provides, in the most acceptable form, the necessary stimulus to bring about time saving—always a factor of importance in releasing capital invested, or expediting its return. But unless it is intelligently applied, after a proper study of all the conditions of the industry, the premium system is likely to prove worse than useless. The example of America, where the system has long been in operation, can teach us much in that respect. A scientific examination of the facts forms an essential condition precedent to its successful adoption. The stimulus to effort must take the form of a sliding premium scale, and what the mine managers of the Rand must do is to fix the outlines of a scheme of this nature, embracing a maximum and a minimum wage, a sliding scale applicable to the different conditions encountered on the Rand—position of stopes, hardness of rock, "wet" or "dry" characteristics of the mine, number of machines or of hammer-boys supervised, etc. A large discretion, however, from the nature of the problem, will have to be left to the individual mine manager or mine captain. To obtain the best work under the system demands the best management, and the latter has been defined as that which utilizes all available knowledge to plan all work and to have it executed strictly in accordance with the plan made, or, more briefly stated, which utilizes labour in the most efficient manner. Efficiency, in a word, will have to begin at the top. With the passing of old *laissez faire*, contract and day's pay methods, and the adoption of the latest practice in the scientific purchase of skilled labour, a new and more strenuous era for everyone will begin on the mines of the Rand. That it will likewise be a more healthy one, we have the testimony of the organised miners' official representatives to prove.

PROGRESS AT THE ROOIBERG TIN MINE.

The New Plant Starting Well—Abundant Water Supply—A Fortune in Accumulated Products.

To judge from the estimate placed upon the prospects of the Rooiberg tin mine by the people who frequent the Stock Exchange, things upon the property do not present a sufficiently rosy appearance to justify more than a languid public interest in the operations which are in progress there. The new mill has started crushing, and the dressing appliances are all settling down to normal conditions without any hitch being reported, but town rumour has it that the ore developments are not altogether encouraging and that the water supply, upon which so much depends, particularly at this time of the year, is likely to fail in meeting requirements. Both of these opinions are about as wide of the actual truth as they could well be.

To deal with the matter of the water supply, it may be pointed out that there are at the moment something like 39,000,000 gallons in the reservoir, which was completed a few months ago, and the six boreholes, which were found quite adequate to the demands of the old mill, are still yielding water freely. The unsatisfactory nature of the last rain season is beginning to be acutely appreciated in the Waterberg tin fields generally, but the Rooiberg Minerals Development Company, Ltd., having recognised the necessity of making ample provision against trouble of this kind, and having constructed an excellent dam upon a spruit capable of holding some 40,000,000 gallons, are now reaping the reward of their foresight.

Ore Developments.

The question of ore development at the Rooiberg is one which it is difficult to deal with in a way which shall be fully intelligible to persons without any mining knowledge beyond that gained from the reports of Rand gold mining companies. In the report of the consulting engineer for the period ended 30th June, 1911, it was shown that the 27,494 tons of ore milled during the previous 27 months were derived from various sources, as follows:—

Tons ore milled from stopes and previously indicated by development ...	9,201	33
Tons ore milled from supplementary fillings not previously indicated by development	14,548	53
Tons ore milled from new development faces	3,745	14
Total ore from mine	27,494	100%

In addition to this, there were milled from surface dumps 7,191 tons.

In other words the development results at the Rooiberg, as shown by ore taken from the mine over a period of two and a quarter years, are no criterion of what is likely to be obtained from ore bodies which lie outside the main fissures or lodes which are opened up in the drives, and this, it may be added, applies to the quality as well as to the quantity of the ore mined from what are called "supplementary fillings." When a block of ground is opened up on the Rand by means of the necessary drives and winzes, its cubical contents and average value can be estimated in advance within fairly close limits of approximation. If anything like 160 per cent. of good payable reef in addition were extracted during the course of stoping, it would be phenomenal and almost incredible in the light of every day experience. At the Rooiberg the quantity of tin ore mined from deposits adjacent to the main lodes, but of which no indication was given during the progress of development, amounted to 60 per cent. more than the quantity mined, which was estimated in the ordinary way from data provided by the drives and winzes, and instead of being a phenomenal circumstance it is merely what the management at the mine have learnt to expect in greater or less degree.

As showing the extent to which these supplementary ore bodies are drawn upon, it may be stated that of 1,571 tons treated during the month of May, 11 tons came from the reserves opened up on the lodes, 1,554 tons were from supplementary fillings, and 6 tons from development faces.

The ore reserves at the end of June, 1911, calculated from measurements and assay samples taken during development, were estimated at 21,650 milling tons, having a recovery value of 4·5 per cent. metallic tin or say £8 per ton gross. From unindicated sources adjacent to the lodes it was considered as safe to calculate upon not less than 20,000 additional tons, and in view of the figures quoted above, it will be admitted that the estimate was not over-sanguine.

Development Values.

From what has been said with regard to these accessory ore bodies, it will be understood that the fact of meeting with poor values at any point or portion of a drive has little bearing upon the probability of finding an ample supply of payable rock in the immediate vicinity. It has equally little bearing, it may be said, upon the probability of finding a large development of good ore between the drives. The gradations which are found in the bankets of the Main Reef series on the Rand have little similarity with the somewhat abrupt changes from low grade to rich ore in the Rooiberg mine, where a level that shows itself consistently poor for long stretches may at the same time be opening up ore masses of considerable extent and value which lie within a few feet of it. Taken altogether, there is no reason whatever to suppose that development results at the mine are other than normal, while some strikes of a distinctly satisfactory kind have been made from time to time. The main, or No. 2 shaft, is down to a depth of 310 feet, and drives in connection with it are being carried at the 210 and 310 feet levels.

In other parts of the property development and prospecting is being carried on with gratifying results, and work has latterly been extended to the investigation of the more or less unknown areas beyond the limits of the older workings. As far as can be gathered from operations which have been in progress since we gave a detailed description of the property, a couple of years or more ago, there appears every reason to consider, as we indicated at the time, that the ore resources of the company are, practically speaking, inexhaustible.

New Plant.

The new mill and dressing plant has been put into commission, and is at present in process of adjustment. We have the authority of Mr. E. J. Way, the consulting engineer, for stating that probably no plant of its kind has ever started in a smoother and more admirable manner. Everything is going without a hitch, and the installation seems capable of doing all that was expected of it, and more, with ease. The ten stamps, with a drop of 4½ inches only, can crush 100 tons per day through about a 60 mesh, and with a higher drop will naturally be capable of a good deal more, so that if required a duty of some 5,000 tons per month could be reached. For the present about 3,000 tons per month will be dealt with.

The producer plant and gas engine of 380 h.p. are working excellently, and altogether the whole new equipment bids fair to give an excellent account of itself as the necessary small adjustments have been effected.

The treatment of the accumulated material will now be taken in hand. It has been estimated that there are 44,000 tons of this material, carrying 2½ per cent. of metallic tin, and this with an anticipated extraction of 77 per cent. and tin at only £180 per ton is equal to a gross return of £125,000, or nearly equal to the whole capital of the company.

Later on plant will probably be installed for the treatment of the finest tin which the ordinary dressing plant is unable to catch, that is to say tin of a grade that is handled by the stream tinners of Cornwall.

PROBLEMS OF THE TIN FIELDS.

The Question of Persistence in Depth—Tin Deposits Favour the Upper Granite Horizons —Conditions in Other Parts of the World.

In a lengthy and useful contribution to "Economic Geology," Messrs. H. G. Ferguson and A. M. Bateman have summarised the geological features of the tin deposits which occur in various parts of the world, and have endeavoured to establish criteria which may prove of value to mining engineers and geologists. It is interesting to find that they have dealt particularly with the problem of the persistence of tin deposits in depth, a matter which has been referred to on more than one occasion in this journal. The tendency of tin-bearing vapours and gases to rise to the surface of the magma in which they have originated makes it a point of importance to study the position of tin ore deposits with relation to the main body of the intrusive mass with which they are associated, and we have already made this clear in connection with the conditions which are found to exist in the Potgietersrust field, where both the superficial horizons of the Bushveld latholith and the basic rocks, which may be supposed to mark its lower limits, are exposed in a more or less continuous section. It is impossible to say how thick the red granite portion of the batholith is at its greatest depth, nor what course has been taken by the tin-bearing vapours and gases in their progress from below to the upper portions of the mass, below the pegmatitic and granophyre of those parts. The dip of the pipes on Zaaiplaats tend to show that the course of the tin has been diagonally rather than vertically upwards, from the main body of the granite, and it is not unlikely that, around the rim of the Bushveld Plutonic Complex at any rate, the direction of least resistance to its progress has been towards the outer edge, up the slope of the overlying Waterberg rocks, especially where the segregation of pegmatite had previously facilitated and directed subsequent flows. The whole thing is, however, problematical. It is a question, nevertheless, which deserves close study, and is one which could doubtless be solved to a considerable extent by the evidence already available.

It is interesting in this connection to notice that tin is reported to have been opened up at the surface, in small quantities, quite near to the norite, on the east, and in somewhat greater quantity in similar rocks in the Marico district.

Relation of Ore Bodies to Intrusives.

To return to Messrs. Ferguson and Bateman. Although in general not a contact-metamorphic mineral, they observe, cassiterite rarely migrates far from the granite contact. In Cornwall the lodes cut both the granite and slates, but the tin is almost entirely confined to the granite. The same condition exists in the Transvaal, where tin is found in the Red Granite and to some extent in the adjacent felsites and quartzites, but in almost every case the cassiterite deposits die out at short distances from the granite. An apparent exception is that of the Rooiberg deposits in quartzite at a distance of five miles from the granite, but here the structure of the area indicates that the granite is continuous beneath the quartzite at no very great depth. In the New England District of New South Wales the tin invariably occurs in the "Acid Granite," in the adjacent country rock, or at the contact. The upward limit of the veins in the Vegetable Creek District in the same region is said to be the bottom of the slates and the top of the granite. The tin production of the Erzgebirge is largely from the greisenized granite. In the "Altenberger Zwitterstock" it is confined entirely to the granite, and the same is in general true for the other districts except Sauberg, where the veins are in mica schist and no large mass of granite has been encountered. Here the presence of granite dykes in the workings indicates that a granite mass exists at no very great depth. Similar conditions prevail in other regions. In reviewing the literature the writers have found that in 26 cases the cassiterite occurs almost exclusively in the granite, while in eight it is divided between the granite and invaded rock, and in only four is it preponderantly in the invaded rock. It is also found that tin deposits are generally lacking where the contact between the granite and invaded rock is steep, but tend to occur in both the granite and overlying cover where the contact dips at a low angle.

Relation of Erosion to Deposits.

Wherever tin deposits accompany a batholithic intrusion of granite it has been found that the deposits occupy positions at or near the summit of the batholith. Hence the extent to which the granite has been eroded is a very significant factor. While none of the descriptions give any definite statement as to the amount of cover eroded, it is not necessary to suppose that the mere presence of a granite batholith always implies excessive depth of consolidation. It has been shown for the Boulder batholith in Montana that at one place the thickness of the cover probably did not exceed some two thousand feet. Where denudation has exposed only the upper portion of the batholith, since deposits tend to accumulate in such upper portions, they may be looked for over any part of the exposed granite area in almost their original proportions. On the other hand, in regions where denudation has extended deeper into the batholith, it may be expected that deposits originally existing in the upper portions would be removed, perhaps to form placers, and that the central portions will contain only the stubs of the pre-existing veins or be altogether barren. In this case the probable position for a tin deposit would be near the border of the batholith. In the Redruth district of Cornwall erosion has cut deeply into the granite and no ore bodies are found in the central portion of the Carn Menellis granite mass nor on the eastern side of the granite where the dip of the contact is steep. The producing district is situated near the northern and western borders where the granite dips gently beneath the slate or where small outlying bosses are exposed. In the Erzgebirge the cassiterite is likewise confined to the upper portions of the granite mass. The Altenberg Zwitterstock extends to a distance of only about 750 feet below the outcrop, while in the Zinnwald the veins die out at even shorter distances. The same relation holds true for other districts in the region where the erosion of the granite has been slight. The largest granite exposures, however, the Eibenstock and the Schellerhau, imply extensive denudation, and there are now no deposits in their central portions, although tin is mined at their margins. In Finland the deposits occur at a considerable distance horizontally from the granite. but at no great height above it. Here again there has been considerable erosion of the granite and deposits are not found in the central portion of the Rapikiwi granite mass. At Ear Mountain, Alaska, the granite carries remnants of its original cover in the shape of small patches of limestone and slate and large blocks of limestone are found included in the granite. In the Malay States, where cassiterite has been exploited in the central portions of the batholith, the remnants of the cover left as patches along the summits of the granite ranges show that erosion of the granite has not been great. In the deposits in the "Acid Granite" of the New England district, New South Wales, Cotton states that "where the ore deposits occur at a distance from the contacts there is usually evidence to show that there has really been a contact at no very great vertical distance and that this has been removed by denudation." It is also true for this region that where the granite has suffered considerable denudation deposits are confined to the borders of the mass and are absent in the central portions. Many other instances might be cited to show the very extensive application of this relation of tin deposits to the depth to which the granite has been eroded.

GOLD ON THE PONGOLA.

Activity on the Farm Klipwal—Natal People Taking a Practical Interest—A Great Future for the District.

Recent information from the Pongola River goes to prove that a considerable amount of activity prevails in the vicinity of Klipwal, and if one is to credit the statements of those who have spent some time in the neighbourhood and are able, therefore, to speak with some authority on the subject, the Pongola goldfield is destined to prove, at no distant period, the centre of a widespread and exceedingly profitable gold industry.

The people of Natal are apparently alive to the fact that the district has possibilities, and it is gratifying to find that they are taking a personal interest in the development of a portion of their Province instead of leaving it to the efforts of outsiders. The success of the Wonder mine, a small proposition which has been several times referred to at some length in this journal, has abundantly demonstrated the economic importance of the field, for there are no reasons to assume that it is *sui generis* in an area in which the general geological conditions are apparently uniform over a considerable extent of country, and, presumably, by analogy with those of other gold regions of repute, by no means unfavourable to the occurrence of gold in considerable quantities. In addition to the evidence derived from the working of the Wonder mine, of which the last word has apparently not yet been heard, in spite of some difficulties in connection with the tracing of the reef extension which were spoken of some time ago, there are the results of prospecting and exploratory work on a fairly large scale upon other properties upon Klipwal and adjacent farms. The consensus of opinion among those who have been engaged in this work is that a goldfield of some importance has at last been proved to exist in Natal. It would be difficult to say with the information to hand whether the field is what is commonly referred to as "a small-man district," or whether it presents inducements for working on a large scale. The large scale working of gold occurrences outside the more or less uniform deposits of the Rand has not yet been undertaken anywhere within the Union outside the Witwatersrand, or even in Rhodesia for that matter, by Rand mining groups or Rand mining engineers, but the fact that no undertaking of this kind has been attempted is no proof, of course, that opportunities or conditions favourable to it are not to be found anywhere in the outside districts. It is to be hoped that the field will be explored and developed on its own merits, quite independent of the views of persons who are of opinion that a gold mine can only be operated satisfactorily from levels driven at uniform distances and from winzes located by the simple device of a tape-measure.

Crushing Operations.

In addition to the crushing operations which are being carried out at the Wonder, on the south side of the Pongola, there is a five-stamp battery running on the mynpacht on Klipwal, on the north side of the river, and an additional 10 stamps are said to be under way for the same mill. It is also reported that a five-stamp battery is under order for a property pegged in the name of J. Atmore, a little to the east of the mynpacht. Some distance to the south of the Pongola, in Zululand, two Chilian mills of the Lane type are said to be doing excellent work on a line of reef which is apparently on the extension of the schistose country in which the Barbel and Klipwal reefs are found on the Klipwal farm.

A large number of properties have been pegged on this property since the proclamation in the early part of last year. Most of the holders, as we have already indicated, are Natal people, although Johannesburg interests are considerably represented. Operations on the Atmore block, for instance, are said to be financed by persons in Johannesburg and Germiston, mainly in the latter place. They are probably mainly employees of various mining companies, for it is astonishing to find how largely those in regular work at the mines, in different departments, are attracted by the possibilities of quartz gold mining in other fields. The knowledge of their own work naturally justifies them in taking a share in undertakings of which they thoroughly understand the strong and weak points, and which, not uncommonly, offer rewards well worth striving for.

Geological Features.

The country in and about the neighbourhood of Klipwal, where the gold reefs are discovered, consists of a succession of quartzites, schists and hard ferruginous slates. The quartz reefs, or rather quartz leaders, are found as narrow veins in the schists, and gold is carried in the latter as an impregnation, as well as in the quartz. Specimens showing visible gold are abundant, and apparently the precious metal lies in zones which have been mineralized by means of the intrusive dykes which follow the line of strike. The country is mountainous and admirably adapted to adit mining, and water is said to exist in abundance.

Wonder G.M. Co.

The report of the directors for the year ended 31st December, 1911, to be submitted at the Third Ordinary General Meeting of shareholders on July 4th, states that the property remains unaltered since the date of the last annual meeting, and consists of 54 prospecting claims and two mining claims situated on the farm "Wonderfontein" No. 486 District of Vryheid, Natal. The capital of the company, on the 31st December, 1911, was £7,000, and consisted of 7,000 shares of £1 each, of which 6,700 were issued and fully paid up, and 300 remained in reserve. Since the date on which the accounts have been made up, by virtue of the powers vested in the directors, they, at a meeting of the Board held on the 14th day of February last, resolved to increase the capital of the company from £7,000 to £10,000 by the creation of 3,000 new shares of the nominal value of £1 each. Of these new shares, 2,500 were to be issued to Mr. Charles Maggs against payment of the sum of £2,500 (or a proportional part thereof as required) and a further 500 shares to be placed to reserve. In consideration of Mr. Maggs providing the £2,500 cash, he was granted an option to take up the existing 300 reserve shares and the further 500 reserve shares at par. The period of the option being for two years from the 14th February, 1912. The full particulars of the terms and conditions on which the increase of capital was sanctioned are contained in the copy of the resolutions. The agreement with Mr. Charles Maggs embodying the terms and conditions set forth in the Resolutions was duly executed on the 21st day of February, 1912. The directors are of opinion that Mr. Maggs' offer was in every way generous and greatly to the advantage of the company, providing, as it does, the necessary cash to enable them to make strenuous efforts to put the mine once more on a satisfactory footing. Since the inception of the company the property has been under the management of Mr. R. A. Rouillard. His agreement with the company having expired on the 1st January of this year, a new manager, Mr. J. B. Jobson, has been installed. Mr. Jobson took up his duties as manager on the 23rd January of this year. The accounts show that the company has made a loss on the year's working amounting to £2,310 3s.

The Quest.

The results of the operations of the Quest G.M. Company during May are returned as: Number of stamps, 30; tons crushed, 2,929; revenue from gold, £3,137; gross profits, including sundry revenue, £714.

THE NEW STEYN ESTATE.

A Huge Dormant Venture—Possibility of Early Exploitation—Some Interesting Calculations.

At the annual meeting of the General Mining and Finance Corporation, Sir George Albu made an interesting reference to the position of the New Steyn Estate property, that huge mining area consisting of just under two thousand claims, which lies to the south of Roodepoort. He said: "There is nothing of fresh interest to record in the instance of this company for the past year. Owing to the existing depression, it has been quite impracticable to evolve any definite scheme for the supply of the necessary funds for entering upon active operations with a reasonable certainty of being able to continue them to the desired stage of gold production. It is a matter for regret that the large mining area of 1,920 claims owned by the company should continue to remain dormant for want of sufficient working capital, as there is no doubt whatever that it contains the elements of a most promising mining proposition, especially in view of its extensive claim area lying just below the ground of the whole of the Roodepoort gold mining properties, which have produced so many millions of gold during the past eighteen years. For this reason I particularly regret that the time has not yet arrived for the initiation of an active working policy. I trust, however, that before long there will be a return of confidence in the industry generally which will enable the board to raise the additional working capital on satisfactory terms."

An Unexploited Section.

Looking at a map of the Witwatersrand, the farms Vogelstruisfontein, Vlakfontein and Rietvlei immediately arrest attention, as they constitute three of the very few remaining unexploited mining blocks in which the reef lies at a comparatively shallow depth existing on the Witwatersrand. As Mr. R. W. Schumacher remarked the other day, it is scarcely likely that any new shafts will be sunk on the Central Witwatersrand, inasmuch as the larger deep level mines possess a dominating position in regard to them. Obviously it would not pay to sink further shafts to the south of the southern boundaries of the existing deep levels, and accordingly these very deep Central Rand areas will be opened up through the existing deep level inclines. On the West Rand—it might perhaps be more accurately written the near West Rand—the position is, however, different. The Witpoortje break rather disturbs the tranquillity of mining conditions in this area, and it is accordingly of considerable interest to hear that Dr. Mellor, the chief of the Geological Survey, is now investigating in this area. However, the Steyn Estate does not come within the fracturing and faulting scope of the Witpoortje break; presumably it does not at any rate. The Steyn Estate area lies to the east of the Witpoortje dislocation, and accordingly the venture holds out distinct possibilities of becoming an important and profitable undertaking.

Size of Property and Depth to the Reef.

In the last annual report issued by the General Mining and Finance Corporation, it is stated: "The position of this company has remained unaltered since the previous year. It was then pointed out that additional purchases of ground had been made, so as to bring the northern boundary nearer the outcrop. This company now owns some 250 claims on Roodepoort adjoining the Roodepoort United M.R., Durban Roodepoort Deep, and Princess Estate, 750 claims on Vlakfontein, to the south and south-west, and 20 claims on Vogelstruisfontein, thus making a complete block of mining ground of 1,020 claims, assumed to contain the dip of what is considered the richest portion of the Main Reef series in the Roodepoort district. Besides these, the company owns a compact block of about 900 claims on Vlakfontein and Vogelstruisfontein to the south and south-east of the beforementioned 1,020 claims, from which they are only separated by a narrow strip of ground. It also possesses some 800 claims on Doornkop. This enormous extent of ground is awaiting more favourable conditions for the provision of the large amount of funds necessary for its exploitation, the £68,000 cash at the disposal of the company being, of course, quite inadequate for this purpose."

At What Depth is the Reef Likely to be Encountered in These Claims?

The distance from the outcrop of the Main Reef series to the northern boundary of the Steyn property varies from 5,000 feet to 6,600 feet. The reef formation has a flat angle of dip in this part of the field. The following table gives the depths the reef would be at northern boundary, assuming different angles of dip:—

	Angle of Dip.	
Distance from Outcrop.	25°	30°
5,000 feet.	2,330 feet.	2,885 feet.
6,000 feet.	2,796 feet.	3,462 feet.

Should the angle of dip of the reef average 25 degrees, a shaft on the northern part of the 975½-claim area would have to be about 2,300 feet down before reef was intersected. If the dip of the reef averaged, say 30 degrees, the shaft would have to penetrate some 2,900 feet to encounter reef. It is all to the good that the company has waited, for it has secured the benefit of experience obtained from various companies operating at similar or even greater depth in the eastern section of the Rand. Taking the tonnage of the Steyn property at 20,000 tons per claim for its South Reef contents only, the hypothetical tonnage in case the block of upper claims contain uninterrupted reef would be: Say 1,000 claims × 20,000 tons = 20,000,000 tons. An indication of the value of the reefs can be obtained from the results secured from the overlying mines, the Durban Roodepoort, Roodepoort United, Princess, Durban Deep, and Roodepoort Central Deep. A new factor, however, is that the outcrop mines are mining fair proportions of Main Reef, and with the lower working costs now prevailing it may be anticipated that this body will also be worked by the New Steyn. This will considerably add to the tonnage per claim, and consequently the life of the property. No account is taken of the separate southerly claims. When European confidence returns to South Africa and capital is forthcoming for new ventures, the New Steyn Estate will doubtless be one of the first dormant concerns to figure in the list of new activity. The depth to the reef is almost moderate in these days of very deep verticals, and as the claims constitute the deep level section of the best mines in the Roodepoort section, it is not unreasonable to look for the earning of substantial dividends from these blocks in the years to come. Apparently the day is not far distant when there will be work carried out on the northern area of 1,000 claims. It is indeed understood that early in 1911 plans were made for a large shaft which was eventually to be connected up with the deeper workings in Roodepoort United ground to the east.

New Transvaal Gold Farms.

An extraordinary general meeting of the shareholders of the New Transvaal Gold Farms, Ltd., will be held on Thursday, 22nd August, for the purpose of considering, and, if approved, passing the following resolution, with or without modification, namely: "That the capital of the company be reduced from £450,000, divided into 450,000 shares of £1 each, to £56,250, divided into 450,000 shares of 2s. 6d. each, and that such reduction be effected by cancelling capital to the extent of 17s. 6d. per share upon each of the 380,000 shares, which have been issued, and are now outstanding, and by reducing the nominal amount of all the shares in the company's capital, including the 70,000 reserve shares, from £1 to 2s. 6d. per share."

THE CAMPAIGN AGAINST PHTHISIS.—I.

What the Prevention Committee is Doing—Recommendations Dealing with New Regulations, Ventilation, Appliances for Dust Prevention—Statement Regarding the Appliances Sub-Committee by Mr. E. J. Way.

In the course of his evidence led before the Select Committee of the House of Assembly, at Capetown, on the Phthisis Bill, Mr. E. J. Way, Chairman of the Appliances Sub-Committee of the Miners' Phthisis Prevention Committee, made the following statement:—With regard to the Ventilation Committee the whole of their work up to date has been spent in endeavouring to devise a machine which will correctly show the amount of dust in a given quantity of air. This is a very much more difficult matter than it would appear to be. At present a machine has been devised upon which certain experimental work will go on, but the committee has had to order a specially designed machine from a Cambridge Instrument Manufacturing Company which will take some months to get here. The idea is that if the machine is perfect, portable and easily managed, every mine will have one, and we shall be able to ascertain in a very short time the exact condition of the dust in the air of a particular mine or any part of it. The work of the Appliances Committee depends to a large extent on the accuracy of the means to be adopted to ascertain the amount of dust in the air, and at present the Appliances Committee have merely drawn up a list of references to the way in which they propose to allay the dust. They do not mean to put in any report until they have proved by means of dust assaying apparatus the fact that there are means which will enable them to lay the dust. The Appliances Committee have divided up their work in the following way:—(1) The use of respirators; (2) dust catchers; (3) universal water supply. These three headings to be discussed in conjunction with the following sub-heads:—(a) Machine drilling, subdivided—(1) Reciprocating machine drills, (2) machine hammer drills, (a) machine hammer drills, (b) machine hammer drills, mechanically water fed. (b) Hand drilling. (c) Blasting, sub-divided—(1) Developing, (2) Stoping, (a) Dry stopes, (b) naturally wet stopes. (1) Old disused areas, (a) dry, (b) wet. (2) Stoped areas open to working face, (a) dry, (b) wet. (d) Shovelling. (e) Disused areas. (f) Travelling ways. The recommendations are as follows:—Universal water supply: Sub-head (a) Machine drilling. It was decided that the principle here should be that from the moment the drill starts to work on the rock, water must be applied to the face, and that the application of water must be continued throughout drilling operations. Sub-head (b) Hand drilling. Agreed to recommendation for the use of swab brush fitting on to the drill bit when collaring holes, the intention being that light water-fed hammer drills should be used for, amongst other things, collaring hand hammer holes. Agreed that the use of the swab brush should apply to machine hammer drills as well as to hand drills. Sub-head (c) Blasting: (1) Developing. Recommended that at the time of blasting an attempt be made to stop the dust by means of sprays at the nearest exit of each working place so as to prevent the dust from travelling through the mine; and that in developing faces a diffusion of water sprayed under pressure be made as near the working face as convenient; and that before charging-up the roof and sides of the working place shall be sprayed back from the face for a minimum distance of 25 ft. Sub-head (c) Blasting: (2) Stoping; (a) Dry Stopes. Agreed to recommend that where blasting from the solid in stopes, such blasting shall not be done at more than one specified time per shift: and that before blasting the whole of the face and the foot and hanging wall of the stope shall be saturated for a distance of at least 25 feet back from the face. Sub-head (c) Blasting, (2) Stoping, (a) Dry stopes. Regarding block-holing, it was decided to recommend, pending further consideration on the subject:—That no subsidiary blasting shall take place in any stope unless the stope be thoroughly saturated with water before blasting, and saturated after the blasting, so that all dust is allayed before the men return to the working place. (b) Naturally wet stopes. It may not be necessary to use additional water, but if necessary then the recommendation with regard to "dry stopes" must also hold good here. Sub-head (d) Shovelling, in connection with shovelling, decided to recommend:—That all mines be specially sampled for dust in mine air once every six months, and that a certain percentage of dust over the mean of the sampling for the previous six months shall constitute the maximum quantity of dust to be present in mine air for the succeeding six months. No mine shall contain a greater percentage of dust than that laid down for the current six months. This recommendation to be taken in conjunction with Sub-section 3 of Regulation 101 of the Mines, Works and Machinery Regulations 1911, where the question of the amount of dust produced by drilling or otherwise is left to the opinion of the mine inspector as to whether or not it is likely to cause miners' phthisis. The object of this recommendation is to constitute a standard to guide any official who may be appointed to go into the matter, so that the personal equation shall be eliminated, as the sub-committee were of opinion that the responsibility laid upon the mine inspector was too great, unnecessary and uncalled for. Sweeping. Agreed that Sub-section (2) of Regulation 101 covers this point. Sub-head (e) Old disused areas, altered as follows:—(e) Disused areas, sub-divided (1) old disused areas (a) dry; (b) wet; (2) stoped areas open to the working face: (a) dry; (b) wet. (e) Disused areas. (1) Old disused areas:—That the dust in old disused dry areas be confined within those areas by the use of appliances for allaying dust, such appliances to be used in the following manner:—The air currents entering old dry disused areas should be met by a spray or sprays of water, or at such points a screen of water should be used, such as the schemes employed by Mr. R. N. Reid, and by Mr. C. D. Leslie, and that where such devices do not meet the case, then the outlets should be controlled by similar apparatus. (b) Wet: Regarding wet areas, if such are sufficiently wet and there is no dust arising from the concussion of blasting, then it will be unnecessary to instal any dust allaying appliances, but should these areas not be sufficiently wet then the recommendation as to (a dry) will apply here (2) Stoped areas open to the working face: (a) dry. Recommendation relating to old disused dry areas shall apply to dry stoped areas open to the working face, until the areas have attained such a condition that further damping will not be required. Where it is not feasible to adopt the methods relating to old disused dry areas, it is recommended that a spray or sprays of water be used at some convenient point in the stope; or in cases where it is considered sufficient, a general hosing of the stope be done at suitable periods; and that appliances be used to bring about a sufficient dampness in the atmosphere of the stope, such dampness to be noticeable on the walls of the stope. (2) Stoped areas open to the working face. (b) Wet: Where these areas are not sufficiently wet, then the recommendation in regard to (a dry) will apply here. (f) Travelling ways: Agreed that all downcast shafts be furnished with ring sprays. It was thought, with the appliances recommended, that in a very short time conditions in the mines would be such that the travelling ways would need but little attention; but where it was found that the methods recommended were insufficient, then special steps would have to be taken to allay the dust in such sections of the travelling ways as may be found necessary.

New Primrose.

An interim dividend (No. 38) of 25 per cent. (5s. per share) has been declared, payable to shareholders registered at 29th June.

THE YEAR WITH THE ROBINSON DEEP.

Net Revenue Shows an Improvement of £84,855—Points from Reports.

The profit from operations at the Robinson Deep for the year ended 31st March, 1912, amounted to £434,493; interest and sundry revenue amounted to £6,686; making a total of £441,180. Provision for Government profits tax absorbed £34,358; sundry amounts written off for depreciation, etc., £3,147; leaving a net balance of revenue over expenditure for the year of £403,673; to which may be added the proceeds of gold won during the year carried direct to gold reserve account, £8,098; making the net revenue for the year £411,771, as compared with £326,916 for the year ended 31st March, 1911, or an improvement of £84,855. To the balance on appropriation account at 31st March, 1911, of £136,969 has been added the balance from working expenditure and revenue account above-mentioned of £403,673, and also a refund, received from the Witwatersrand Native Labour Association in respect of 3,300 shares, 6s. paid, being 5s. per share in excess of their book value, of £825; making a total of £541,467, which has been dealt with as follows: (1) Dividends and bonus paid to shareholders amounted to 30 per cent. and 2½ per cent. respectively, which absorbed £325,000; (2) votes to the reserve for additions to and renewals of machinery, plant, etc., £30,000; less sundry replacements during the year, £13,125; total, £16,874; add proceeds of gold recovered from the plates dismantled in the mill (in the process of rearranging the metallurgical plant) specially voted to this reserve, £9,095; (3) profits appropriated for capital expenditure, viz.: For payment on 30th September, 1911, to the Government of the Union of South Africa on account of undermining rights purchased, £28,998; provisions for future payments of the same, £35,000; sundry works, £705; total, £64,703; leaving a balance to the credit of appropriation account at 1st March, 1912, of £125,794. The proceeds of gold in reserve or gold not credited to working expenditure and revenue account at 31st March, 1912, amounted to £19,080, as compared with £10,982 at 31st March, 1911. The balance sheet shows that the company had the sum of £35,337 on special deposit at 31st March, 1912. This sum represented amounts appropriated from profits since 1st September last, at the rate of £5,000 per month, plus interest earned to 31st March, 1912, thereon, which the directors have decided shall be used for the payment to the Government of the Union of South Africa of the purchase annuities at the rate of £28,998 per annum in respect of the undermining rights.

ACTING SUPERINTENDING ENGINEER'S REPORT.

Mr. J. W. Craig, the acting superintending engineer, writes: "A re-estimation of the ore reserves at 31st March last shows that there were fully developed some 1,141,000 payable milling tons of an average assay value of 7·0 dwts. In addition there were 83,000 payable milling tons of an indicated value of 6·7 dwts., in areas partially developed but not yet ready for stoping. In arriving at these totals and averages we have not included any tonnages or values of the ore in the water-right claims acquired from the Government, but the year's working has proved that the grade of this ore will favourably affect the grade of the mine until the water-right area is exhausted. The results of the year's work show a gratifying advance over those of the preceding year. With a reduced force of native labour the tonnage milled was increased from 533,850 tons to 594,800 tons, the working costs were reduced from 18s. 11·133d. to 17s. 7·182d., and the working profit per ton increased from 12s. 6·325d. to 14s. 3·647d. During the year the reduction plant has been rearranged and increased so that by the end of the present month it will be capable of handling to the best advantage an output of 60,000 tons per month."

THE MANAGER'S REPORT.

The Manager writes, *inter alia:* The following report covers the operations of this company for the year ended 31st March, 1912:—*Development:* Driving, 9,359 feet; raising, 1,560 feet; winzing, 3,070 feet; crosscutting, 1,566 feet; total, 15,555 feet. In addition to the above, 15,482 cubic feet of excavation for ore bins, etc., were completed. *Shaft Sinking:* No. 1 incline shaft—No further sinking was done; depth, 1,730½ feet. No. 2 incline shaft was sunk 306 feet to a total depth of 3,618 feet. This footage was done on behalf of Booysens Estate, Ltd. *Ore Reserves:* The ore reserves exposed at 31st March, 1912, amounted to 1,141,000 milling tons at an average assay value of 7·0 dwts., and some 83,000 tons of partially developed ore valued at 6·7 dwts. *Mining:* Rock hoisted, 698,521 tons; waste sorted out, 103,721 tons, equal to 14·85 per cent., of which 167,226 tons, or 23·94 per cent., were broken by hand; 480,862 tons, or 68·84 per cent., were broken by machines; and 50,433 tons, or 7·22 per cent., were taken from development. *Milling:* 210 stamps ran 342·733 days, crushing 594,800 tons, giving an average duty per stamp of 8·264 tons per day and producing 106,534·925 ozs. of fine gold. *Tube Milling:* Five tube mills ran 342·516 days, treating 383,696 tons, yielding 52,905·231 ozs. of fine gold. *Cyaniding:* The sand plant treated 342,260 tons of sand, producing 47,650·600 ozs. of fine gold. The slime plant treated 252,540 tons of slime, producing 19,092·277 ozs. of fine gold. The following statement gives the results of the operations for the year: 594,800 tons crushed, yielding from all sources £948,778 5s., equal to 31s. 10·829d. per ton; working expenses (including £13,125 5s. 1d. expended on renewals and replacements), £523,380 6s. 6d., equal to 17s. 7·182d. per ton; profit on working, £425,397 18s. 6d., equal to 14s. 3·647d. per ton; add sundry revenue, rents, transfer fees, etc., £6,686 10s. 10d.; total profit, £432,084 9s. 4d. The introduction of mechanical appliances to replace natives in every department is receiving our constant attention, and it is satisfactory to note that, though the average number of natives available during the year was slightly less than the previous year, the tons milled show an increase of 61,000. Small stoping machines, which account for 70 per cent. of the ground now broken in stope faces, continue to give very satisfactory results, as will be seen from the following statements, which compare the work done by hammer boys, small and large machines:

	Total Shifts worked in Stope Faces.	Total Fathoms.	Fathoms per Shift.	Ratio.
1911—				
Hammer boys ...	144,775	10,956	·076	1·0
Small machines .	23,429	12,884	·55	7·24
Large machines ..	18,718	11,662	·63	8·34
1912—				
Hammer boys ...	90,872	6,583	·072	1·0
Small machines .	32,320	22,657	·701	9·7
Large machines .	11,969	9,096	·760	10·6

A small number of hammer boys are still employed, but it is hoped that during the present year their work will entirely be superseded by small machines. The powerful ventilation fan installed underground came into operation towards the end of March, with satisfactory results, which will become more apparent as the ventilation currents are equalised to meet the new conditions. Organised methods of dust-laying are being brought into use throughout the mine, and the success already achieved in this direction is most encouraging.

Apex and Benoni.

MEETINGS TO BE POSTPONED.

As the negotiations with regard to the proposal to effect an amalgamation between the above companies have not yet reached finality, a further postponement for a period
Apex Company on Wednesday.
of 14 days was decided upon at the annual meeting of the

DEEP MINING PROBLEMS ON THE RAND.

Questions of Shafts, Pillars, Timbering and Ventilation.

[From a Correspondent.]

There are some mine managers and consulting engineers on the Rand who appear to be of the opinion that the hanging and footwalls accompanying the Main Reef series are so strong and compact that at depths of over 3,000 feet—even when the whole of the reef is exhausted—no movement or subsidence is likely to occur. A result of acting up to this opinion may be seen in the frequent occurrence of shaft troubles at various mines of the Rand, always causing considerable inconvenience and expense and not infrequently high costs, in the shape of sand-filling and repairs, not to mention heavy losses in the shape of diminished outputs. Most readers will be able to bring to mind occurrences of this character, more particularly at some of the deep level mines, even during the past few years. As a matter of fact, even when mining operations in a deep level mine may have been carried out on safe lines, the shaft may be damaged by the work carried on in the neighbouring outcrop mine, owing to the shaft having been placed too near the outcrop boundary line. In an outcrop property the same difficulty does not of course present itself, as the ground beyond the outcrop naturally will not be affected by mining operations. Many engineers in the past, with the object of saving sinking, have placed deep level vertical shafts practically on the boundary line to the rise, in such a position, in fact, that the exhaustion of the outcrop property cannot but result in inflicting sooner or later serious damages to the shaft.

This raises the question whether it would not be better, where amalgamations between outcrops and deep level mines are advisable—and there are few instances where they are not—to arrange such amalgamations long before the outcrop mine is practically exhausted. This would enable the outcrop mine to leave that portion adjacent to the shaft sufficiently intact to prevent any damage being done to the deep level shaft, and so avoid the heavy costs some mines have had to incur in sand-filling worked-out areas adjacent to such shafts. Any reef so left to secure the shaft would, naturally, not be lost, but subsequently worked before the vertical shaft was abandoned, or any other time it was considered advisable to do so. If it was practicable to so protect these deep level shafts, the question arises—in the face of the very long lives of some of the deeper concerns—whether shafts of a more permanent character than those generally sunk on the Rand should not be provided. Timber at best is a poor material with which to protect very deep shafts; its life is short, and to keep a timbered shaft in good order under normal conditions is a constant source of expense, both in wages and materials. Where the shafts are dry there is also the risk of fire, and many of the existing deep shafts on the Rand have such an apparent long life of usefulness before them, that it is to be anticipated that their timbers will have to be renewed from end to end, perhaps several times, with all its accompanying expense, before the shaft ceases to be used.

Ventilation in these deep level mines has at last become a recognised necessity, and in an upcast shaft there is nothing so destructive to timber as return air. Steel-lined shafts would have, naturally, a much longer life, and there are cases where they might be adopted with advantage in upcast shafts. They possess many advantages over timber protected shafts, under normal conditions, and in the long run are cheaper, but their first cost is heavy. In the case of an up-shaft, steel, however, is much more preferable to timber, and in most respects more durable, but after all it cannot compare either in cost or durability with a brick or masonry lined circular shaft.

It is no new proposal to substitute circular for rectangular shafts in metalliferous mining, where rectangular shafts for obvious reasons have hitherto held sway, because as a matter of fact they are being adopted locally and with advantage in Cornwall, where by the use of a circular shaft a saving in working costs of 4s. 9d. per ton has been effected, as well as in the Mysore district in India, and deep metalliferous mines elsewhere. On the Rand also, conditions are fast approaching in the very deep level properties when it seems opportune to consider whether circular shafts cannot be adopted with advantage. As already pointed out, the unusually long lives some of the deep level properties must necessarily have would seem to be a strong point in favour of shafts without timber lining. As a rule timber cannot be relied upon under most mining conditions, for more than ten or a dozen years, whereas a brick lined circular shaft may be regarded to all intents and purposes as permanent, and instances are known where they have been in use for nearly a century. Take, for instance, the ground lying to the dip of the present deep level companies, there are few instances where under prevailing conditions a vertical shaft would be considered as likely to be sunk, especially if the depth is, say, 6,000 feet. It is far more likely that such ground may be worked by means of the existing deep level shaft, which means for it a life of perhaps half a century and perhaps more. This is simply mentioned to show that some of the present deep level shafts may have a much longer life than at present seems probable, and that deep mining conditions are fast approaching when more permanent shafts will be required. In heavily watered strata all the advantages, of course, lie with a circular shaft. As a rule only where it is necessary to sink through newer geological formations as dolomite, or Karoo beds, has unusually heavily watered strata so far on the Rand been met with. Speed of hauling is another condition likely to accompany deep mining on the Rand; there again a circular shaft is seen to advantage. In permanence, speed of hauling, and ventilation facilities, a circular shaft has many advantages over the rectangular shafts now so extensively used, whilst the first cost of sinking a circular shaft of similar area on the Rand is shown to-day to be even less than that of rectangular shafts under precisely similar conditions. At the annual meeting of the State Mines, where rectangular shafts are being sunk under what must be considered as almost ideal conditions, the average cost was stated to be £30 a foot, whilst a circular shaft of similar area in an adjoining property is costing but £25 a foot, a marked advantage when probable life and cost of repairs of the two types of shaft are taken into consideration. Possibly these results can be much improved upon. There is not only the great saving in the first costs of the four shafts to be considered, but also in the maintenance, renewal costs in wages and repairs, which taken altogether on such a long lived property must exceed £100,000.

The need for a more permanent shaft for working our deep-seated reefs, such as for instance those lying to the dip of the deepest level mines, does not exhaust the necessity for a modification in the system of working. Although the jury system has been abolished, and few Government enquiries are reported, several serious and fatal accidents have recently occurred, distinctly to be traced, in several deep mines, to the occurrence of what, for want of a better term, are called "air blasts." Two such accidents have occurred within the last fortnight, one involving the loss of nine lives; and whereas on the Rand a fall of rock is calculated to sweep such a comparatively large underground area, these occurrences are attended with considerable danger. In all cases they may be distinctly traced to the leaving of inadequate pillars, and sometimes they occur where the stopes are not at abnormal depth.

The need for more substantial pillars is likely to be overlooked, owing to the fact that working from the outcrop downwards, the need has only been gradually brought into existence. There are few mines where on attaining a depth of 2,000 feet special attention to the size and arrangement of the pillars is not required, in contra-distinction to the rule of thumb so often observed. At a depth of 3,000 feet such attention is imperative, and will increase until such a depth is attained, that some modification in the system of working will become necessary. Small inadequate pillars at these growing depths on the Rand are worse than no pillars at all; the so-called safety pillars left between individual properties, or for protection of objects on the surface, are likely to also become an element of danger, rather than otherwise. The time is fast approaching on the Rand when some system of mining may have to be followed by which the use of pillars, as now employed, may require to be altogether avoided. The excellence of the Rand hanging and foot walls have contributed much to the safety of Rand mining in the past, but it cannot be traded upon for ever, and by the time the present depth of mining is less than doubled on the Rand, such conditions may come into play as will require a radical change in underground mining methods.

TREASURY GOLD MINES.

Annual Report—Satisfactory Financial Position.

The report of the directors of the Treasury Gold Mines, Ltd., to be submitted at the annual meeting on August 30th, states that no change has taken place in the company's property holding since the last general meeting. In accordance with the agreement entered into between the company and the Jumpers Gold Mining Company, Ltd., in 1910, the ore of both mines has been mined and treated by the latter company.

The appropriation account may be summarised as follows: Credit balance brought forward from last year, £80,328 12s.; less amount of profits reserve account included as profit in statements to 31st March, 1911, £1,535 3s. 11d.; total, £78,793 8s. 1d. Profit on joint working with Jumpers Gold Mining Company, Ltd., for the year, less administration expenses, £5,832 2s. 8d.; rebate of freight on gold, rent, interest, etc., £3,041 13s. 10d.; total, £87,667 4s. 7d. From which have to be deducted: Auditors' fees, £210; Government tax on profits, being further payment due to 31st October, 1910, £209 8s.; French fiscal duties, £172 3s. 2d.; income-tax paid in London, £90 13s. 7d.; amounts written off on account of livestock, vehicles and harness, etc., £366 2s. 3d.; total, £1,048 7s.; leaving a balance to be carried forward of £86,618 17s. 7d.

It will be noticed that the profit derived from the joint working during the year under review amounted to £5,832 2s. 8d., after deducting the administration expenses. It must, however, be borne in mind that this sum does not represent the actual profit earned, as in terms of the working agreement with the Jumpers Company, that company has to set aside monthly £400 out of its share of profits until this company's share of profits amounts to £53,500. If, upon the termination of the agreement, the Treasury profits have not amounted to £53,500, the sums so set aside by the Jumpers Company will be devoted to make up this deficiency in so far as they go. The sum set aside for this purpose at 31st March, 1912, amounted to £6,800.

As the company's share of the profits from the joint working with the Jumpers Company has been smaller than was anticipated, it was decided to effect a considerable reduction in the administration expenses, this reduction applying to the directors' fees, as well as to the remuneration of the consulting engineer and secretary.

Capital expenditure to the extent of £1,259 7s. 10d. was incurred during the financial year, in connection with the joint operations. On the other hand, sales of buildings, machinery and plant, livestock, vehicles and harness, and Witwatersrand Native Labour Association shares, realised £1,872 6s. 3d., whilst £329 17s. 1d. were written off livestock, vehicles and harness account.

The retiring directors are Messrs. W. H. Dawe, C. S. Goldmann, J. Friedlander, J. Andrew Cohen, E. J. Renaud, A. G. Gill, and W. H. B. Frank.

Katanga Tin.

The Elizabethville correspondent of the Johannesburg *Star* writes:—"There are reports of good finds of tin in the reserves of the Bakat and Geomine Companies, and the assays are satisfactory. The only question is whether the ore is present in large quantities, and whether it will pay the companies to work the deposits in the present condition of transport. When this important problem is solved to the benefit of the country at large—this matter is being considered by the local and home authorities—all industries will go ahead."

Zaaiplaats Strike: Further Particulars.

The Mine Manager reports as follows:—"Development at No. 6 Roodepoort section has now located a large payable ore body. We have at least ten feet by twenty feet already exposed (a subsequent telephone message states that 10 feet by 25 feet was exposed by last two blasts), with pipe matter still in the roof and sides. It is similar in appearance to No. 13. The lower section over five feet is good grade with big patches on the footwall as high as 30 per cent. tin. I consider on further development that this will prove to be a producer second to none on these fields. The ore body is now being developed by a winze, which is being sunk from above, and two drives on the footwall, and has every appearance of being very large when fully exposed. By survey it is 162 feet from the boundary of the Zaaiplaats (a subsequent telephone message states that a re-survey makes the distance 150 feet), and making straight for it. It is dipping at about ten degrees. We are starting night shift immediately."

Nourse Mines.

The quarterly report of the directors of the Nourse Mines, Ltd., shows that the net profit was £67,281. The interim dividend of 10 per cent., declared on January 17th last, absorbed £82,282. The balance carried to the balance-sheet was £77,399. The credit balance of appropriation account is not wholly available for distribution, as the amount of liability at the commencement of the financial year (£33,895), together with the capital expenditure for the nine months ended April 30, 1912 (£27,935), have not yet been appropriated. The amount to be appropriated for these sums will not be determined until the end of the financial year and after it has been decided what dividend is to be declared for the half-year ending July 31, 1912. In development work the number of feet driven, sunk and risen, exclusive of stopes, was 6,305. The reef disclosures were as follows:—Main Reef: Distance exposed, 579 feet; width, 28 inches; assay value, 49s. 7d. Main Reef Leader: Distance exposed, 3,028 feet; width, 15 inches; assay value, 10s. 7d. South Reef: Distance exposed, 1,323 feet; width, 16 inches; assay value, 86s. 6d. The reduction works details show: Ore received from mine, 180,877 tons; waste sorted out, 14.1 per cent.; tonnage crushed, 155,500 tons; number of stamps operating, 260; number of tube mills operating, 7; value of ore before crushing (reflected by mill yield and value of pulp)—mill yield per ton, 22s. 10d.; assay value of pulp, 8s. 9d.—31s. 7d. Total yield, 56,192 fine ounces; total yield per ton, 30s. 3d.; accumulated slimes treated, 4,340 tons. General.—It has been decided to discontinue the practice of carrying reserve gold; a special declaration of £2,465 was made at the end of March, but this sum has not been included in the above yield per ton for the current quarter. Preparations are being made to resume sinking operations in the west incline shaft. Satisfactory progress has been made in the South Nourse section with the work for the station and engine chamber for the new incline. It will be noticed that the value of the ore exposed by development operations, and before crushing, is now shown in shillings and pence. Capital Expenditure.—The proportion of the annuity due to Government for nine months ended April 30 and expenditure on property account amount to £2,679. Equipment and development account for the quarter shows a credit of £343, due to a transfer therefrom to mine development suspense account. There is an amount of £28,408 yet to be expended on the present capital expenditure authorised.

THE RAND GEOLOGICAL CONTROVERSY.

Mr. J. S. Olver's Criticism of Dr. Mellor's Views—Some Inconsistencies of the Rietfontein Fault.

At the S.A. Geological Society's meeting on May 13 I read a second contribution* to the discussion on Rand geology initiated by Dr. Mellor's paper, "The Normal Section of the Lower Witwatersrand System," which was read on the 20th November, 1911. The Editorial Committee of the Society declined to publish my contribution in its Proceedings, giving as the reason that, "The Committee felt that the absence in your paper of any new geological facts bearing on the question directly under discussion prevented it from printing your second contribution in the Proceedings." The Committee's action seems very arbitrary, when it is remembered that the only part of my contribution which might be said to have no "bearing on the question directly under discussion" was a direct reply to criticisms of my work which Dr. Mellor had made in the course of this discussion. That criticism, if allowed to stand by itself, would be very damaging to me, as it had been printed in the Proceedings and circulated to members. Common fairness would therefore seem to dictate that equal publicity should be given to my answer, especially since Dr. Mellor's criticism was not given at any meeting of the Society, and that I therefore had no chance of making an immediate reply.

More than that, it must have become apparent to every one interested that Dr. Mellor's theory and mine are mutually destructive. If my theory can be established, Dr. Mellor's at once falls to the ground, while his can scarcely meet with general acceptance so long as a theory so well-attested as mine is allowed to stand without effective criticism. The area with which I have dealt includes that discussed by Dr. Mellor in his paper. The main purpose of my work, like his, was to establish the true "normal section of the Lower Witwatersrand System." It therefore seems desirable—if the object of the discussion is to unearth the fundamental truths of Rand geology—that the two theories should be discussed together. However, since the Editorial Committee has taken this action, I shall take no further part in the Society's discussions, but shall adopt other means of making known the results of my further study of Rand geology. It is for Dr. Mellor himself to decide whether he can afford to ignore my criticism.

Since I wrote my first contribution to the discussion of Dr. Mellor's paper some three months ago, I have made a very careful re-examination of the whole area under discussion. I had deliberately kept my thoughts away from these problems for a few months in order that I might come back to them with a fresh mind, and I have tried to reconsider all the available evidence with as little bias as possible. I was quite prepared to find, as I said in my first contribution, that I had made mistakes in several directions; but the result of this reconsideration is, in fact, that my faith in my original solution of the problem (always omitting the suggested north-eastern extension of the Rietfontein reefs) has been renewed and greatly strengthened, with regard not only to the general outlines of the reading, but to all important details. At the same time the gulf between Dr. Mellor and myself has widened very materially—indeed, the "common ground" referred to in my first contribution is much less extensive than I then suggested. It has been reduced upon resurvey to three main sections—the inadequacy of previous readings; the isolation of the Rietfontein area by heavy faulting; and the existence of my Orange Grove Fault along that part of its course which lies to the north of Witpoortje and Florida. It must be admitted, then, that my first estimate of this common ground was somewhat optimistic, but this optimism was inspired by a genuine wish to provide a basis for compromise between the warring factions of Rand geologists.

Dr. Mellor, in his first paper, "Some Structural Features of the Witwatersrand System," says: "The general effect of the fault is that of a downthrow to the north, increasing in magnitude from west to east, and complicated by considerable folding and overthrowing." This refers to the "Rietfontein Fault." Now, it was pointed out in "Faults and Dykes" that no fault with a simple downward movement on its north side could bring the granite into contact with one of the higher beds of the overlying formation; yet that is supposed to be one of the effects of this fault. Dr. Mellor himself seems to have seen that some more complete explanation of this phenomenon was called for, and he has gone much more fully into the matter in his second paper. But, even now, it is difficult to realise what is his exact conception of the occurrences. He speaks in several places of the "compression" and "elimination" of various beds, and one's first impression was that he believed the lower portion of the formation to have been squeezed out by the pressure between the granite and the upper beds. This impression was confirmed by the explanatory sections, but it appears to be contradicted by the following sentences, which, if taken by themselves, would appear to leave no room for doubt as to Dr. Mellor's own views: "A simpler explanation, which would account for almost all the observed facts, would be that there was originally a comparatively simple fault along the line in question with a downthrow to the north increasing from west to east, and subsequently there had been great pressure in a north and south direction by which the beds south of the fault had been overtilted and the downthrow portion practically thrust over them approximately along the plane of the fault. To this latter movement would be due the appearance of a broken fold shown by the beds on the south of the fault as well as the elimination of portions of the sequence and the apparent carrying of the granite over the edges of the adjacent sedimentary beds."

Such a reversal of movement is, of course, perfectly possible, but I submit that it would not explain the conditions illustrated by Dr. Mellor in his sections. The natural result of a change in the direction of pressure would seem to be that the portion on the upper side of the fault, which had first been moved to the north, would travel southwards (relatively) along the fault plane to and beyond its original position. An overthrust would be produced in this way, but the fault would not then show a downthrow on its north side. The final result would in fact be the same as though the whole operation had consisted of a smaller upward movement on the north side, and it is very unlikely that there would be any visible evidence of the greater double movement. But this simple movement, whether double or single, would not account for the position as Dr. Mellor sees it. Let us suppose then that the later movement took place on a new fault plane roughly parallel to the other. Dr. Mellor, in fact, suggests only an approximate coincidence of the planes. Such a development is also quite possible, though less probable, and—if the newer plane were

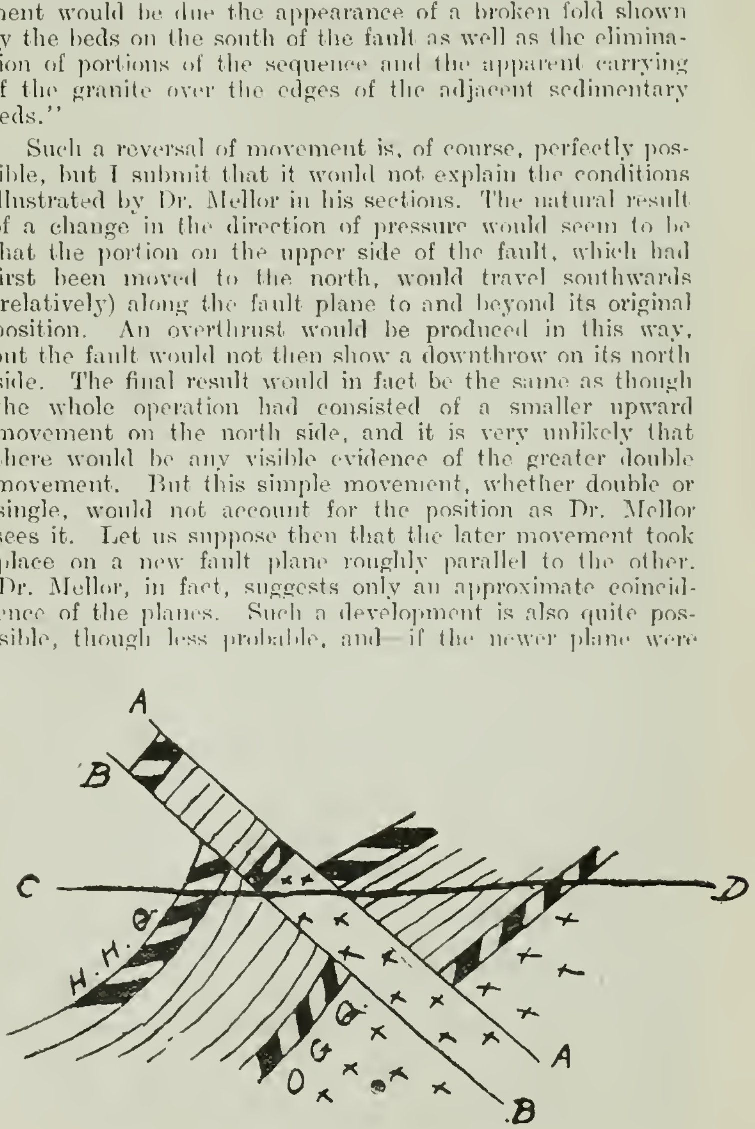

Fig. 1.

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* Notes published in *S.A.M.J.*, May 18, 1912.

lower than the older and the second movement of less magnitude than the first—an overthrust would be induced along the lower plane, while the net effect of the two faults would still give a downthrow to the north. Fig. 1 will illustrate my meaning. The older fault is marked A and the newer B. If subsequent erosion be supposed to have brought the ground level down to the line C D, it will be seen that a downthrow will be exhibited, while at the same time the lower beds will be covered up by the granite.

This, then, would appear to supply a feasible explanation of the supposed conditions; but I think I can show that it does not do so in reality. I can find in the field no evidence at all of overthrust. There is no sign of the granite lying on the upturned edges of the lower beds. The plane of contact between the granite and the quartzites is, so far as I can see, parallel to the planes of bedding, and Dr. Mellor himself shows it as practically parallel. Schist intervenes between the quartzite and the granite, and both schist and granite show planes of shearing roughly parallel to the bedding planes—both characteristics of the normal conjunction of the Witwatersrand System with the underlying rocks. More than that, it seems almost incredible that the effects of overthrust and erosion would balance so exactly that the surface line of contact between quartzite and granite (or schist) would remain parallel to the strike of the formation over long distances. Yet such parallelism exists along the southern side of the Bezuidenhout Valley. Further, I see no reason why faulting of this kind should induce severe tilting or drag on its south side and none on its north. One would certainly not expect to find such different conditions on the two sides of any particular fault, even though they may be possible.

I find it, indeed, quite impossible to accept overthrusting to account for the supposed elimination of the lower beds of the system in the eastern end of the Bezuidenhout Valley, and I am disposed to think, in spite of the sentences quoted above, that Dr. Mellor did not mean to rely on this explanation. He also referred in his second paper, on p. 118, to ". . . . the granite . . . . crushed along the fault over the lowest Witwatersrand beds," but his sections do not in any way suggest overthrusting; while the perspective view (Fig. I), in which the granite is supposed to have been removed, indicates clearly that the beds are absent and not merely covered. Fig. 3 in his second paper gives the impression that he attributes the supposed conditions on Barrett's Rietfontein to the combined effects of a simple fault and of compression in a north and south direction. The fault itself does not affect the Witwatersrand System at this point, so that the whole of the supposed elimination of the lower beds of the system is accounted for by the compression. That, at least, is my reading of Dr. Mellor's meaning; and that he at any rate considers such intense compression possible is proved by the general lines of his reasoning. A case in point is the assumed elimination of the "Coronation Quartzites" and accompanying beds going westwards from Barrett's Rietfontein. No fault is shown to explain their disappearance.

If my supposition be correct, then, Dr. Mellor imagines his "Rietfontein Fault" to consist of two components—a simple fault with a flat dip and large downthrow to the north, and a "squeeze" from north to south. (A detail to be noted, though it is not of vital importance, is that the throw of the fault is shown to have changed in going westwards from a downthrow to an upthrow north.) The relationship between these very dissimilar components remains practically constant for a distance of about 20 miles, from Rietfontein to Florida, and a little reflection will show that this constancy is very extraordinary. I pointed out in "Faults and Dykes" that there is a strong tendency for a newer fault to take the line of least resistance offered by any older fault or fracture, when the line of movement of the newer is nearly parallel to any line lying in the plane of the older fracture. But there would seem to be no reason whatever to anticipate any such affinity between the fault and the squeeze which make up the "Rietfontein Fault." They could not, so far as I can see, have resulted from similar conditions, and the set of opposing forces which caused the one could scarcely have produced the other, even though the direction of impulse had been reversed. It may be safely assumed that the two occurrences were not simultaneous, and it is difficult to imagine that the squeeze shown in the section through Barrett's Rietfontein can have been produced by forces acting along any line other than one nearly perpendicular to the plane of the fault, *i.e.*, along a line nearly at right angles to the line of the forces which caused the fault-movement. The fact that the original throw on the fault was not reversed by the newer forces seems to confirm this—supposing that, as Dr. Mellor suggests, the squeeze is the more recent. Why, then, should the squeeze follow the line of the fault over such a long distance? The fault line would not be a line of least resistance for the compressive forces. In fact, whichever is the newer, there seems to be no reason at all why the fault and the squeeze should maintain their supposed intimate relationship along a course which passes from horizon to horizon in the Witwatersrand System and through beds of very different hardness and character. Dr. Mellor can hardly claim the merit of simplicity for his conception of the "Rietfontein Fault."

Leaving for the moment the question of the probability of the startling effects of compression which Dr. Mellor claims to have discovered, from what evidence does he deduce the existence and course of his fault from Kensington to Florida? The evidence chiefly relied upon seems to be the dip of the formation, the line of the fault being taken to be practically the line of greatest dip of the formation. I pointed out in "Faults and Dykes" that one would expect a decrease, and not an increase, of dip as the effect of a fault with a downthrow to the north, when the general dip of the formation is to the south. If that be so, a line of greatest dip cannot be a reliable guide to the course of such a fault. One has to be cautious, however, in anticipating the effects of such a complex fault as the one we are dealing with. But I maintain that it would be impossible in practice to trace a line of greatest dip along the suggested course of the fault. The Government Reef series, and the contiguous beds above and below that series, almost invariably show a high dip wherever they are exposed between, say, Driefontein in the east and Hamburg in the west; and the change to a lower dip is usually a gradual one. It would, then, be more correct to speak of a broad zone of greatest dip. Moreover, there appears to be no reason to connect this zone with the existence or course of the "Rietfontein Fault." These beds can be seen to be just as steep on the average at points, such as Florida, Malvern or Driefontein, where they are far removed from the supposed fault line, as at Claremont or Brixton, where they are in contact with that line. I therefore cannot accept this suggested evidence of faulting.

A further peculiarity of the "Rietfontein Fault" is that it seems in places to have no throw at all. Dr. Mellor's map shows the fault as passing through the Government Reef just west of Brixton without disturbing it to any appreciable extent. Again, it seems to throw the Hospital Hill Quartzites very little at Maraisburg. On the other hand, the Orange Grove Quartzites are shown as being cut off abruptly on the north-east side of the fault to the north of Maraisburg and not to exist at all on the south-west side. It is difficult to imagine how the Hospital Hill and Orange Grove Quartzites could be affected in such different ways at points so close together on the same fault. To put the matter briefly, after very thorough and repeated examinations, I cannot find the slightest evidence that any fault of real consequence passes through the ridge containing the Government series between Johannesburg and Florida. Dr. Mellor speaks of this horizon in the neighbourhood of Brixton and Claremont as being very much disturbed, but I can find no evidence there of anything more than very ordinary disturbance. A section of the beds from the Contorted Bed up to the Doornfontein series at Brixton would be very similar to a corresponding section at the Scottish Monument; and I believe that the succession of beds in each of these sections is quite normal and that Dr. Mellor's idea of the elimination of certain beds in each section is based on a misconception. I will deal with that point later.

(*To be continued.*)

THE MINERALS OF THE MURCHISON RANGE AND DISTRICT.—II.[*]

Account of the Haenertsburg and Woodbush Goldfields—Gold-bearing Deposits of the Black Reef Series—An Important Government Report on the Results.

The various economic deposits along the Murchison Range and to the south show highly variable characters. In some cases one has to deal with bodies of pure quartz arranged in lenticular fashion and without any marked persistence along the strike; in other cases certain zones in the schists have become mineralised without a true reef having been developed and marked off from the country rock, e.g., the Sutherland Reef or the workings at the Old Quagga Camp. In still other cases, the gold has been found in soft highly decomposed brown or black earthy ferruginous bodies, derived from the decomposition of what are essentially banded magnetite quartzites or so-called banded ironstones (calico-rock), e.g., Coblentz, etc. Some of these modes of occurrence bear a striking resemblance to analogous deposits observed in the schist-belt of Mount Mare near Marabastad, south-west of Pietersburg. In the account given by Dr. Mellor[†] the following classification is adopted, covering most occurrences:—"*Lenticular Reefs* usually composed of coarsely crystalline quartz, or quartz with calcite, dolomite, and other carbonates showing no schistose structure and more or less sharply distinct from the country schists, whose planes they occasionally cross. *Mineralised Zones in the schists,* consisting of innumerable lenses and thin sheets of crystalline quartz usually associated with calcite, dolomite, and iron-carbonate, intimately connected and interleaved with the schists, following their planes and schistosity and merging into them on their margins. *Black Reefs*, or banded ferruginous quartz-schists, schistose quartz rocks with numerous bands of ferruginous material sometimes almost entirely composed of iron-oxides.

Unfortunately, some of the evidence is no longer available, and this applies even more so to the older mines like the Gravelotte, La France, and Blue Jacket, where the descriptions of early observers constitute the only record. Along the Murchison Range there are two well-defined mineralised belts running parallel to one another for some miles, and coinciding roughly with the two conspicuous ridges alluded to in Chapter I. The most northerly belt includes the ridge on which the Gravelotte Mine, the United Jack, the Weigel Gold Mining Company (Maid of Athens Hill), and the old Free State Mine are situated; it continues eastwards through the Oostphalia property, Castle Kopjes, and the faint ridge associated with the Quagga Camp. The southerly belt comprises the ridge of high ground marked by Spitzkop and includes the Blue Jacket and La France Mines. These two belts are about three or four miles apart, and separated by the broad densely wooded valley of the Melati River. The more northerly belt contains antimony, while the southerly belt is chiefly noted for gold only—Spitzkop belt. More recently considerable attention has been paid to the Antimony belt, and a large amount of prospecting and developing has been done in places; no work whatever is being carried out along the Spitzkop line. Outside the Murchison Range proper mining operations were at one time in progress at the Shotover, Sutherland Reef, Coblentz Mine, and elsewhere; all suspended at the present time, only the Griffin Mine remaining. Ore deposits, belonging to the group of "Black Reefs" or "Burnt Reefs," are typically exposed on the farm Coblentz No. 315, and consists essentially of banded magnetite quartzites, usually very highly decomposed and thoroughly ferruginous in character. Owing to this prolonged decomposition, the rocks have become friable and more earthy, which fact has given rise to the designation "Burnt Reef." On Coblentz such ferruginous quartzites are very well exposed on the northern slopes of the prominent ridge, known as Mashambane Mountains, where they are associated with siliceous dolomitized quartz schists typically represented by the so-called Mamba Bar, occurring along the crest line of the range and described in Chapter V. The iron-oxide is an invariable constituent of the reefs and may largely predominate under certain conditions; it comprises magnetite, hematite, and limonite. On Coblentz No. 315 at least two such magnetite quartzites are exposed, one of which has a thickness of some 30 feet. It is in part pyritic, as indicated by the occurrence of cavities due to oxidation and removal of pyrites. The workings, however, are barely beyond the first prospecting stage and still within the oxidised belt. The reefs exposed on Coblentz and frequently referred to as the "Coblentz Reef" occur at several other localities, where banded magnetite quartzites have been located, e.g., at the Coblentz extension, a few miles west-north-west of Leydsdorp, at the Blue Jacket Mine, and at the La France, where Mr. Sawyer refers to them as follows:—"In the second category fall those various reefs in which quartz, in its pure mineralogical sense, does not compose the entire mass of the reef, but in which oxide of iron occurs in much abundance. Such are the reefs at the La France Mine, on the La France extension claims, the Anglia claims, the Gravelotte, the North Reef, and others. Reefs of this nature are called burnt reefs—an appropriate name, as the iron no doubt occurred in them in the form of pyrites, and this has become oxidised, or burnt, down to a variable depth, which at the La France is 100 feet. Below that depth numerous sulphides, in which those of iron predominate, occur. . . . . The 'quartz' at La France, down to a variable depth of 100 feet or less, consists of soft crumbly siliceous and ferruginous, yellowish-green to brown matrix, containing lenticular bands and pieces of greyish-black quartz. The reef matter contains from 33 to 45 per cent. of ferric-oxide, about 50 per cent. of silica, and a little alumina. The pyritical portion contains a little arsenic and traces of other metals."[*] To the type of deposit exemplified by the Coblentz Reef also belong the auriferous quartz bodies, at one time worked at the Quagga Camp, exposed in numerous pits and trenches a little west of the Quagga beacon near the eastern end of the range; banded ferruginous quartzites are well exposed here and present characters essentially like those associated with analogous exposures along the Mashambane Hills on Coblentz No. 315. Within a succession of pale green soft chloritic and hornblendic schists with a slight northerly or almost vertical dip, thin bands of dark earthy ferruginous quartz are found over an average width of three to four feet, which is subject, however, to much variation. Individual bands rarely exceed two or three inches in thickness; the country schist is sometimes not well defined against the outer layers of the reef matter, and within the quartz itself thin greenish partings may be observed. The richest portions have a cellular saggy or burnt appearance, are frequently yellowish and earthy—owing to the complete oxidation of iron-ore. Visible gold is not infrequent, while occasionally a little arsenical pyrites is found. Commonly the reef matter forms bands of glassy quartz, or irregular patches and "blows." Within the greenish schists of the country rock occur ill defined smaller masses of glassy vein-quartz, streaked by black or brown ferruginous layers. While in some respects there is a very close resemblance to the Coblentz Reef, elsewhere the characters approach more to a mineralised siliceous zone in the schists. Along the northern line of reefs, as well as in the immediate vicinity of Leydsdorp, both lenticular masses of pure quartz and mineralised zones in the schists are exposed at numerous points, in the former belt frequently associated with antimony in the form of stibnite. Such occurrences are exemplified by the United Jack, the Weigel Gold Mining Company, and by the workings adjoining the old Free State Mine on the east (Weigel Consolidated), in all of which the ore bodies are intimately associated with large conspicuous masses of limestones or dolomitised quartz-schists. As a rule the reefs form elongated lenticular bodies, which rapidly thin down along the strike, apparently die out, but probably represent more persistent, though not necessarily continuous, zones in the schists. At the Weigel Gold Mining Company the country rock weathers to a soft reddish phylitic variety, traversed by thin veins of quartz arranged in conformity with the schist planes, and usually consisting of elongated lenticles connected by fine siliceous partings, which form an excellent model on a small scale of the larger ore bodies. As a rule the dip departs only a few degrees from vertical, and may be directed now to the north now to the south, but more often the latter direction predominates. Near the western end of the United Jack are some very interesting open cast workings (known as the "Quarry"), at the southern foot of a prominent little kop. The rock over the latter and in the quarry is a greyish dolomitic limestone, traversed by a coarse network of quartz veins and containing disseminated patches of antimony sulphide, sometimes concentrated into more conspicuous masses and intermingled with white quartz. Further east the country rock is a sheared greyish limestone with green partings, within which a more clearly defined reef body up to nine feet in width is exposed. At the Weigel Gold Mining Company the reef is four to five feet wide and several hundred feet long, behaving like an interbedded deposit. In addition to stibnite and gold, there is also some copper. The purer more solid bodies of the antimony gold ore consist of very fresh grey coarsely crystalline stibnites, which on prolonged exposure acquire a characteristic bluish tarnished surface. A typical sample gave 71 per cent. of metallic antimony, which corresponds to almost pure sulphide and showed no copper, iron, or silica: this pure variety is often associated with finer more compact sulphide and pale yellowish matter, distributed like an alteration product: it represents hydrated antimony ore, giving 14.9 per cent. of metallic antimony and answering to stibiconite. Numerous prospecting operations covering the area immediately south of Monarch Kop (Free State beacon) and adjoining the old Free State Mine on the east (Weigel Consolidated) have exposed a series of reefs which, in part at least, appear to form an extension of some of the deposits of the old Free State Mine. From south to north the following are the principal reef bodies, some of which are, however, not sufficiently prospected to afford any definite conclusions as regards payability and persistence. The most southerly reef lies a short distance north of the main road, and consists of irregular veins, streaks, or patches of grey copper-ore, carbonate of copper, and antimony sulphide; it contains copper, gold, silver and antimony, associated with greyish-yellow masses of crystalline rhombohedral carbonates. The deposit is associated with large irregular masses or "blows" of quartz in a whitish-grey or pale greenish coarsely crystalline lenticular limestone. These masses of quartz are probably of secondary origin and due to subsequent infiltration of silica. They are highly irregular odd-shaped occurrences up to one foot in length and intimately intergrown with the dolomitic country rock; after prolonged exposure the more easily soluble magnesia and lime are completely removed down to the last trace, leaving a remarkably peculiar fantastically shaped cellular mould of quartz, coated with a delicate brown ferruginous film. Further to the north lies the so-called "burnt" reef, with impure limestone as country rock. This deposit is a soft earthy brown highly ferruginous body up to eight feet in width, which becomes pyritic at a depth of about fifty feet; it lies with a large lenticular mass of coarsely crystalline limestone on the north side of a slight topographic feature. Still further beyond the edge of the limestone just referred to, the country formation consists of soft dark greenish thinly bedded schists, in which the Antimony reef occurs, with characters essentially like those of the reefs at the United Jack and the Weigel Gold Mining Company, and also associated with pale greenish thinly bedded more granular limestone. The reef consists of very coarse fresh lustrous crystalline veins, patches, or streaks of stibnite with yellow decomposed hydrated antimony ore—stibiconite—interrupted by irregular areas of coarse quartz. A little further north, at least one additional reef has been located which forms a narrow mineralised zone in soft highly contorted greenish phyllites. It is made up of a series of thin grey fine-grained quartzose layers, separated by fine vein like films or partings of pale green phyllitic material. Immediately joining the above-mentioned workings lies the old Free State Mine, where operations have now been suspended for several years. Both lenticular reefs and mineralised zones are represented. "The Pyritic Reef of the Free State Mine consists of a well-defined zone in the schists, consisting for the most part of quartz having a schistose structure, dependent upon the occurrence of numerous planes marked by the presence of films of chloritic, talcose, and sericitic material. The rock is such as might be produced by the abundant infiltration of quartz between the fine lamillae of a talc-chlorite schist. In some places the individual bands of quartz between these separation planes are from one-sixteenth to an eighth of an inch in width: in others they swell out to two or three inches or more, and are then usually distinctly lenticular in character. Occasional lenticles up to a foot in width are met with. The quartz is dark grey in colour, very fine in texture, and translucent. Associated with it are calcite and dolomite. Disseminated thickly throughout the rock, but more abundant in certain bands, specially those with many chloritic partings, are abundant crystals and aggregates of coarse pyrites, forming patches one-sixteenth to one-eight of an inch in diameter. In many cases these have been broken and drawn out by shearing, the effect of which is also evident in the rock as a whole, which in places has an 'augen' structure, the quartz being drawn out into eyes separated by layers of calcite and other carbonates, talc, and chlorite. It is evident, therefore, that the schistose character of the rock has been developed, in part at least, after the deposition of the quartz and pyrites. Veins and masses of antimonite occur in places."

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[*] From Memoir issued by the Geological Survey.

[†] Annual Repirt of the Geological Survey for 1906, p. 38.

[*] A. R. Sawyer: "Mining: Geological and General Guide to the Murchison Range." London, 1892, pp. 82, 85, 86.

(To be continued.)

AFFAIRS IN THE FAR EAST RAND.

The Rand Klip Assays Results—Reassuring Clean-up at Benoni—The Far East in the Share Market.

The assay results from the reef struck the other day in the eastern shaft of the Rand Klip, Ltd., are not calculated to inspire enthusiasm in the breasts of those concerned, and will probably, on the other hand, be taken advantage of by the gloomy brigade in the sharemarket and elsewhere to sound a note of warning, if not to indulge in the usual ululation in the press. The official announcement cabled from Johannesburg to the London office of the company is:—"Referring to our telegram of 10th, average all check samples, width 54 inches, value 2·18 dwts. Station and sump in progress, driving in reef will commence in a month or six weeks." Looked at sanely, and in the light of everyday experience, all that is to be remarked of the occurrence is that it is an unhappy accident. The eastern, or No. 13 borehole, came upon similar poor values, but the No. 11 borehole, to the west of the shaft, showed 10·6 dwts. over 36 inches. Previous boreholes gave equally varying results, and in a country where somewhat erratic values are, perhaps, the rule, it is unwise to arrive at definite conclusions from such scanty evidence as that already provided. By contrast, the results reported from the Government Gold Mining Areas in the same neighbourhood of 7·15 dwts. over 35 inches, are all the more gratifying.

THE PROMISE OF THE EAST.

In an article which appeared in this journal a fortnight ago, we dealt at some length with prospects of the vast gold-bearing area which constitutes a field of industry to itself beyond the Blue Sky break, and it is unnecessary, therefore, to repeat figures which were made use of to show that the area east of Boksburg "is becoming each year a very much more important factor of Rand industry, and that it will continue to assume increasing importance." A temporary blur upon the economic outlook in the Far East was caused by the decision to suspend operations at Benoni, but even here the matter of values was not called into question. The publication of the data relating to the clean-up has, moreover, confirmed the impression that the mine and works were far from shaping badly. The urgency of the financial position had, doubtless, much to do with the policy finally adopted, and little harm will have been done if the scheme of amalgamation proposed to be effected with the Apex is carried out on lines acceptable to the chief parties to the proposed arrangement. The cabled announcement with regard to the clean-up, by the way, states:—"Final clean-up from the works has produced 1,840 ounces fine gold of an estimated value of £7,667. In addition to this, the manager estimates that the plates have absorbed 400 ounces of gold." The gold which would have been available as profit, in a word, if the absorption process had not demanded it, would have been equal in value to about £10,000, or, roughly, £2,500 per month, making the April profit about £3,290, instead of £775, exclusive of that to be derived from slimes treatment and improved cyanide operations generally. Meanwhile, the meetings called to consider the question of amalgamation have been again adjourned, and shareholders will now have nearly another fortnight to consider the problem. *The Statist*, together with the rest of us, has been taking a special interest in the progress of the far East recently, and the following comparative list of prices during the past two years or so, taken from the last issue to hand, should prove instructive and useful:—

	Issued Capital £	Present Price.	—1912*— H.	L.	—1911— H.	L.
Apex (£1)	300,000	$1\frac{3}{4}$	$2\frac{3}{16}$	$1\frac{5}{16}$	4	$1\frac{5}{8}$
Benoni (£1)	394,249	6/-	13/9	3/9	23/9	10/-
Boksburg (£1) ..	540,000	2/-	$3/10\frac{1}{2}$	-/6	8/9	1/-
Brakpan (£1) ..	750,000	$3\frac{15}{16}$	$3\frac{9}{16}$	$2\frac{7}{16}$	$3\frac{1}{8}$	$2\frac{7}{16}$
Con. Mines Sel. (10/-)	600,000	14/-	13/6	7/-	15/-	8/-
Daggafontein G.M. (£1)	536,507	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{19}{32}$	$\frac{1}{4}$
East Rand Ex. (£1)	293,000	3/6	7/6	1/3	17/6	1/3
East Rand Mining Est. (£1)	450,000	6/-	8/6	4/6	13/9	5/-
Govt. G.M. Areas (Modderfontein) (£1)	625,010	$1\frac{5}{16}$	$1\frac{1}{2}$	1	$1\frac{7}{16}$	19/6
New Modder (£4) ..	1,400,000	$10\frac{7}{8}$	$11\frac{7}{8}$	$10\frac{5}{16}$	$13\frac{1}{4}$	$10\frac{7}{8}$
Modder B. (£1) ..	700,000	$2\frac{13}{16}$	$2\frac{15}{16}$	$2\frac{1}{2}$	$3\frac{1}{16}$	$2\frac{1}{16}$
Modder Deep (£1) ..	263,000	$1\frac{1}{2}$	$1\frac{3}{4}$	$\frac{15}{16}$	$2\frac{1}{8}$	1
New Era (5/-) ..	100,000	9/-	9/-	5/-	10/-	5/-
Rand Colls. (£1) ..	631,250	$\frac{3}{8}$	$\frac{9}{16}$	$\frac{3}{16}$	$1\frac{3}{16}$	$\frac{3}{8}$
Rand Klip (£1) ..	432,336	6/6	7/6	2/6	12/6	2/6
Spring Mines (£1)	630,000	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{5}{16}$	$\frac{27}{32}$	$\frac{3}{8}$
Transvaal Coal Trust (£1) ..	515,560	$2\frac{1}{2}$	$2\frac{5}{16}$	$1\frac{11}{16}$	$2\frac{1}{16}$	$1\frac{1}{2}$
Van Dyk (£1) ..	500,000	$\frac{3}{32}$	$\frac{1}{4}$	1/6	$\frac{3}{8}$	$\frac{1}{32}$
Van Ryn Deep (£1)	1,496,114	$1\frac{1}{32}$	$1\frac{1}{8}$	$\frac{7}{8}$	—	—

* To May 14th, 1912.

Witwatersrand.

An interim dividend (No. 16) of 17½ per cent. (3s. 6d per share) has been declared, payable to shareholders registered at the 29th June.

CRUSHING MACHINES FOR CYANIDE PLANTS.*

By Mark R. Lamb, Milwaukee, Wis.

The recent growth of a sentiment among cyanide-plant designers against the use of gravity-stamps for the crushing preliminary to cyanidation may be said to date from the almost simultaneous perfection of the ribbed tube-mill liner and of the tall, air-agitation tank. The first step in the resulting change of practice was the universal adoption of the tube-mill for fine-grinding and the use of coarse screening on the battery. This was the beginning of the surrender of supremacy by the gravity-stamp; since merely the single fact that it was a more economical machine for crushing fine had retained it in favour as compared with ball-mills, rolls, or steam-stamps. The surrender, however, is not yet complete. It is the universal practice to use rolls where a relatively small tonnage is to be crushed coarse, as, for example, when coarse concentration is included in the plan of treatment. Power, attendance, repairs, and first cost are smaller for the rolls, under such circumstances, than for stamps; and it is becoming daily more apparent that, with no concentration to provide for, the use of rolls and tube-mills, without the complication of trommels and elevators required by concentration, is rapidly gaining favour in the eyes of the leading designers.

The next step was the use of the rapid-running Chilean mill between the gravity-stamps and the tube-mill, which again narrowed the field of operation of the gravity-stamp while radically widening its screen-aperture. Such a combination of stamps and Chilean mill offers advantages when fine concentration is necessary, since the reduction in the Chilean mill can be adjusted easily and governed by varying the screen-mesh. But even concentration is now looked at askance. One of the leaders of this metallurgy has abandoned the separation and separate treatment of concentrates in the gold-mill which he is operating, and uses the concentrators merely as separators of a product requiring finer grinding than the average ore. The concentrate thus caught is continuously returned to the tube-mill, only that part of it escaping to the cyanide-plant which is too fine to be caught again on the tables, and which is, therefore, in a proper condition for cyanide treatment by air-agitation. Another consulting metallurgist has advised his clients to omit concentration in treating a silver-ore which is quite similar to that of Pachuca. At this point the old-style Chilean roller-mill has begun to come into its own, as, although expensive in first-cost, power—labour—and repair costs are very low.

The next step in point of time and the most radical in apparent daring was the abandonment of amalgamation of every product except the concentrates by the Goldfield Consolidated Company in treating a high-grade, free-milling gold-ore. Undoubtedly there were numerous reasons for this step; but not the least of these was the loss of gold through the operations of the illicit gold buyers. The fact that the ore is so rich and the concentrate so very high in grade makes the change unusually noteworthy. Whether the above-described scheme of sliming the concentrate and treating it with the balance of the pulp should be recommended in the Goldfield case, can only be decided by careful experiment. It is only fair to remember that the Meyer and Charlton last year experimented with a view to omit all amalgamation, both on mill-plates and on shaking-tables, recovering all the gold in the cyanide works. This was reported a failure, but details are lacking. In any case, the Goldfield plant at present uses the stamps merely for coarse crushing, a work which probably could be done more cheaply with rolls, if the plant were redesigned; and the necessary machinery would cost less. Even steam-stamps would be cheaper than gravity-stamps, but the fuel-cost would have to be compared with that of local electric power.

In considering the steam-stamp, it should be borne in mind that there is no practical crusher of this type on the market with a capacity between the small Tremain, with its 20 or 30 tons daily to 3-mesh, and the stamp of the Lake Superior district, which crushes from 500 to 800 tons. This significant lack has dawned on several manufacturers at the same time; and the mine-owner with reasonable fuel-cost no doubt soon will have offered to him a simple steam-stamp of from 100 to 200 tons capacity, the cost of which will leave him little reason to prefer the gravity stamp. The literature concerning the steam-stamp is strangely meagre. There are scores of these monster machines in the copper country, and no secret is made of the operating and repair costs. The differences between the products of the various manufacturers, as well as between the simple and the compound stamp, are thoroughly well known, and the opinions of those locally in a position to know are in singular accord, particularly as regards the relative efficiency of the compound and the single stamp. While, theoretically, the former has the advantage to the extent of 27 per cent., the operators will concede a bare 17 per cent., while with one voice they urge, as more than off-setting the saving of fuel, the disadvantages of the more complicated machine—difficulties of repairs and greater loss of time in tearing down to replace a broken cylinder-head or piston-rod. Moreover, while one man can attend to the operation of a single stamp, three are required on some of the compound stamps. On account of mass-copper, a "human" feeder is required to be in constant attendance on these large units; but an automatic feeder will be provided with the smaller units designed for crushing gold and silver ore.

For soft, or even for hard but friable ore, the cyanider should be encouraged by the success of the pebble-mill, taken from the cement industry, to adopt one more machine from the same source—namely, the ball-tube mill. The disadvantages of the ordinary ball-mill which has been tried here and there on ore—its expensive liners and screens when used for fine crushing—are entirely avoided in the ball-tube mill. What remains is merely a shell on trunnions with simple ribbed lining and a load of forged-steel balls. It may be of interest to state here that a 7 by 7 ft. ball-tube-mill weighs 54,000 lbs. without its 12-ton charge of steel balls. The mill with balls sells for about $4,300, requires 140-h.p. and crushes 260 tons of dry clinker in 24 hours from 2 in. to 20-mesh or a proportionately larger quantity to a coarser mesh. Clinker, as regards hardness, may be considered a rather soft ore, though in thinking of the work done in the mill, any piece of ore is soft under the blow of a 6-in. steel ball weighing 30 lbs., and falling five or six feet. In a delightfully frank contribution to the *Mining Journal* of September 4th, M. W. von Bernewitz gives interesting data on dry-grinding in ball-mills. He breaks 120 tons in 6 hours in a No. 5 Gates, and puts the 3in product through three No. 5 ball-mills to 27 mesh. This dry-grinding costs 42 cents per ton, each mill requiring 16 to 20 h.p. The wear is 3·5 oz. of steel per ton of ore ground.

It will be seen from all the foregoing that there is a choice among three machines, to replace gravity-stamps advantageously in cases where neither concentration nor amalgamation is necessary. The columns of the technical press show that the simple nature permitting such treatment is attributed to an increasing variety of ores. In fact, except for the occasional manganese-silver ore, it might be said that cyaniding is a purely mechanical process, requiring a chemist merely as a form of insurance. A simple crushing and grinding plant would consist of breaker, ball-tube-mill, classifier, and pebble-tube-mill, in which attendance and skill-requirements would be reduced to a minimum. If rolls are preferred to the ball-tube-mill, their substitution does not affect the other machines. If fuel is advantageously cheap, the plant will consist of crusher, steam-stamp, classifier, and tube-mills. For small plants or with unskilled labour the slow Chilean mill has advantages. In either case, there is no work for the gravity-stamp which cannot be done better by either of the other coarse crushers.

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* Paper read before the American Institute of Mining Engineers.

We may rest our case against the gravity-stamp in general terms as follows:—Large tonnages of hard ore are crushed advantageously to 3/16 in., or coarser, with steam-stamps. Steam consumption, labour, repairs, and first cost are smaller than the corresponding items for gravity-stamps. Such steam-stamps are for capacities exceeding 500 tons daily. Small tonnages of hard rock are crushed advantageously with rolls, which are admittedly cheaper than gravity-stamps in first cost, repairs, labour, and power, if they are not expected to crush too fine, and are not complicated with screens and elevators—as they need not be for feeding tube-mills. Large ball-tube-mills are available for reducing 3-in. ore to a size suitable for feeding pebble-tube-mills in one operation with no screening. Scores of these mills are in use for crushing hard, glassy clinker. The objection may be urged that tough quartz is very different from clinker. So it is; but the same objection was urged only a few years ago against the use of the pebble-tube-mill, and was found to be groundless, except that the capacity of that mill is smaller with quartz than with clinker. Finally, small steam-stamps will undoubtedly be at the disposal of the metallurgist within a short period. This machine needs no explanation or justification, since it will merely fill the gap in sizes of a type of mechanism the merits of which have been proved in practice. The entire mechanics of the cyanide process have changed radically within a short period. While we in America have wondered and worried because South Africans were building heavier stamps than we could be persuaded to use, perhaps, after all, we have been luckily slow.

S.A. INSTITUTE OF ENGINEERS.

Annual Meeting and Reports——Awards of Prizes and Medals—New Officers.

The annual meeting of members of the South African Institution of Engineers was held at the Chamber of Mines last Saturday night. Mr. F. H. Davis (President) was in the chair.

Prizes and Medals.

Mr. Arthur C. Whittome, secretary, presented the annual report, from which it appeared that the last year's proceedings had been very successful. The Council had great pleasure in announcing that the Institution's gold medal had been awarded to Mr. Alpheus Williams for his paper entitled "The Kimberley system of handling large quantities of ground in the minimum of time, with some notes on the life of wire ropes." In this connection the Council wished to make special mention of the excellence of Mr. A. E. Blevin's paper, entitled "The evolution of printing and type-setting machinery." The Central Mining and Investment Corporation's prize had taken the place of the "Lionel Phillips's Prize," Sir Lionel Phillips and his confreres having deemed it better to show that the Corporation as a body desired to express its sympathy with the resident engineers, and to encourage them to present papers to the Institution, than to continue the Lionel Phillips Prize. Now that the certification of engineers was extended to the whole of the Union of South Africa, very keen competition for this prize could be anticipated, the Central Mining and Investment Corporation having generously agreed to grant the award annually. For the past year the award had been made to Mr. T. P. E. Butt, for the reply to the discussion on his paper entitled "The electrification of Randfontein Central." It was regretted that there was not keener competition for the "Price Award," for the present open to students only in this, the first year that it had been awarded. On the other hand, the papers received were of considerable merit and the sub-committee entrusted with making the award had carefully to compare them before coming to any decision on the matter. The prize had been awarded to Mr. Percy Perrow for his paper on "The distribution of electricity on a mine using purchased power." The Council recorded its appreciation of the courtesy which induced Mr. B. G. Lloyd, A.M.I.C.E., to present 120 volumes of the proceedings of the Institution of Civil Engineers to the Institution.

Finances.

The financial side of the Institution was revealed in the statement that the balance of total assets over liabilities was more than twice as much as it was in 1904, and was some 55 per cent. greater than last year. The balance of actual cash in hand over total liabilities was nearly three times as great as in 1901, and was more than 50 per cent. greater than last year. The capital fund, with interest accrued to May, 31, now stands at £1,250 11s. 8d. The publication of the Institution's Journal for 1912 showed a profit of £35 12s. 2d. The report further stated that one of the objects which the Council had kept in view was the establishment of branches of the Institution in the important centres of South Africa. Though no branch had been definitely formed during the year, the first will be inaugurated at Kimberley during the next few months, and it was believed that this would be followed very shortly by a second in another centre. The credit balance for the year was £419 14s. 8d.

The Treasurer.

Mr. R. G. Campbell Pitt (hon. treasurer), in a few remarks explanatory of the statement of accounts, said that they had received the most satisfactory statement which had ever been presented to them. Their assets had increased during the last year by, roughly, 50 per cent. Two points were to be particularly noted: first, that they had now turned the £1,000 mark for funds on fixed deposit, and, second, that the net assets totalled, for the first time, over £2,000. It was also worthy of note that for the first time during their history, over £1,000 had been collected for the current year's subscriptions. Some of the members might have felt that they had been worried for their subscriptions during the past year, but he thought they would admit that the return had justified the sending out of circulars requesting payment. The sub-committee who considered the matter of change of policy over a year ago had no doubt as to the ability of the Institution to provide the necessary funds for the extra expenditure invested, but he fancied that very few members of the Council, or of the Institution, thought that there would be such a great development. A fact on which members could pride themselves was that the satisfactory state of their financies was not due to any outside contributions. The funds had entirely been provided by the members. He felt sure that the ensuing year would be as prosperous as the past one had been. In conclusion, Mr. Pitt thanked the secretary, Mr. Whittome, for the help given him at all times. The happy position put before them was largely due to his hard work and organisation. A vote of thanks to Mr. Whittome was carried. The report and accounts were adopted.

Election of Officers.

The election of officers for the current year resulted as follows:—President, Mr. J. A. Yule; vice-presidents, Mr. W. L. Honnold and Mr. W. Calder; hon. treasurer, Mr. R. G. Campbell Pitt; hon. solicitors, Messrs. Hayman and Godfrey; auditor, Mr. F. W. Bompas; council, Messrs. R. N. Kotze, J. A. Vaughan, S. T. Tregaskis, A. Wallace, E. Farrar, E. J. Laschinger, T. P. E. Butt, R. Price, J. W. Kirkland, E. J. Way, and C. O. Schmitt.

MINE SUBSIDENCES ON THE RAND.

Their Causes, Consequences and Prevention in the Interests of Public Safety—Earth Tremors—New Light on a Vexed Question.

[By the Government Mining Engineer.]

At the annual general meeting of the South African Institute of Engineers, Mr. R. N. Kotze (hon. president) delivered the following valedictory address :—I propose, he said, to touch upon a few subjects which, while perhaps not of a very general interest, yet fall within the purview of the engineer, and present problems which at some time or other have no doubt engaged the attention of some of you. The question of subsidences on under-mined ground, of the prevention of such subsidences and the permissible limits of mining, is one which has to be considered by many mining companies on the Rand and elsewhere in the country. The safety of the travelling public is also involved, for sections of the public railways and roads on the Rand pass over ground underlain by payable reef, and are frequently undermined, and an unforseen and sudden subsidence may cause sufficient damage to the railway line to lead to derailment of a train. The ultimate responsibility for safeguarding railways and other structures and for any damage caused by a subsidence generally rests on the company carrying on the mining operations. In addition to this, the Mines and Works Act and the Regulations give the Mines Department extensive powers for laying down and enforcing conditions under which undermining may take place, and generally prohibit such undermining without the sanction of the Department. There are various complicating factors which have a bearing on the question of responsibility for supporting the railways and from time to time decisions have been given in Court by which the law on the matter has been rendered somewhat clearer; but there are points which still require elucidation, and which will no doubt be the subject of further litigation. Beyond stating these general facts, I do not intend discussing the legal aspect, and will proceed to the methods of support, a subject which will be of greater interest to engineers.

TWO GENERAL CASES.

On the Rand there are two general cases to be considered, that of railways already undermined, and that of railways proposed to be undermined. The former class is a legacy of the past, when the law regarding undermining was less stringent than it is now, or when the railway line was laid over ground from which reef had already been abstracted. Some of these cases are extremely difficult to deal with. For example, when the stopes have already commenced to cave and are thereby rendered difficult of access, or where the reef has a steep angle of dip and it becomes difficult to devise a form of packing which will not in course of time slip down the stopes. In all these cases the only possible method of safeguarding the line is by packing of some sort. It is obviously unnecessary in many cases to provide a form of support that will maintain the level of the line on the surface unaltered, and it is, moreover, impossible to provide such a support in the majority of instances. All that can be attained is to let the surface down so gradually that no steps will be formed in the level of the surface, and that the ordinary maintenance of the line will suffice to keep it in good order. The comparatively recently introduced method of wet sand-filling apparently provides the best support and the one least likely to lead to a disturbance of surface levels. Ordinary packing is, however, the more usual method, and in some instances simple filling in of the open stope is resorted to. In the latter case the filling rests on the drive pillars, the boxholes being carefully packed by hand with selected large rock. In one instance in a steep mine 60-lb. steel rails hitched into hanging and foot and lagged were tried, but after some years it was found that the rails had bent and the packing had run down. In such steep stopes it is best to use loose filling resting on drive pillars, and not to seek to confine the material sideways by packs, but to let it find its natural angle of repose and to go on filling till the width at the top is sufficiently great.

KLEINFONTEIN COLLAPSE.

In the case of ground not yet undermined, the general rule it to lay down no restrictions against mining when the depth of the reef exceeds 1,000 feet vertical, and to allow little or no mining for depths of less than 100 feet. Between these limits a gradation in the strength of the support is adopted. When sand-filling is adopted, complete removal of reef is permitted, but when loose filling or packs are selected instead, solid pillars are generally insisted upon. The object of this is to provide for a more general settling of the ground. If, for example, there are faults in the ground which would result in a sudden subsidence if no packing were provided, packing alone without pillars is likely to result in a similar, if smaller, subsidence. Solid pillars, in addition to the packing, will prevent this if provided to a sufficient extent. In leaving pillars where one or more reefs are worked, care must be taken to have their centres over each other on a line at right angles to the dip. Neglect of this precaution resulted in a serious underground accident on the Kleinfontein in 1909, eleven persons being killed by the collapse of a middling between two stoped-out reefs. As regards the limits of support on either side of a railway, the rule at present observed by me in the case of a railway running parallel to the strike is to make the southern limit coincide with the southern edge of the width to be protected, and on the northern side to draw from the northern edge of that width a line which bisects the angle between the normal to the plane of the reef and the perpendicular. In the case of a railway running parallel to the dip line, an angle of break of 20 degrees from the vertical is allowed for, and in lines which are neither parallel to the strike or the dip, both rules are used in conjunction to work out the intermediate position. If there are known faults or dykes in the ground, allowances are made according as these tend to support the ground against movement or the reverse. The local knowledge of the responsible engineers of the companies and their suggestions have often been of assistance in devising satisfactory methods of support, but there is sometimes a natural tendency on their part to aim for supports which will just outlast the life of the mine, while the department, on the contrary, aims at conditions which will permanently secure the safety of the line.

QUESTION OF URGENCY.

The question of urgency has in certain cases given rise to some friction. Experience has, however, shown that reliance cannot be placed upon the strength of ground, and that subsidiences have taken place which were totally unexpected. Unknown faults and slips exist in all ground, and, together with the unequal distribution of weight, cannot be foreseen or allowed for in the least, and the safe rule is therefore to pack or otherwise support as soon as possible after excavating. This is almost always cheapest, too, for the facilities for carrying out the work are generally greater when stoping is going on in the neighbourhood than at a later date.

Railway lines running over coal-mines are not allowed to be undermined except for the purpose of putting main headings through them. The width and height of these is generally restricted, and the condition made that the heading must be completely packed before final abandonment. The protective pillar is made wider than the area to be safeguarded by allowing for an angle of fracture of 20 degrees from the vertical. The necessity for these somewhat stringent precautions is evident, for coal strata have the peculiarity of sometimes breaking in over quite small areas of excavation, such as the width of a bord or roadway, and, in the case of fire only, a continuous solid pillar of coal without any openings through it is likely to withstand destruction. Closely connected with subsidences is the occurrence of the shocks which are felt from time to time in Johannesburg and at other points on the Reef. That these are due to undermining admits of no doubt, and in several cases the shock has been found to happen simultaneously with some occurrence underground which clearly indicated the cause of both.

ORIGIN OF SHOCKS.

These shocks, which most of you are probably acquainted, consist of a single wave or vibration only, and are accompanied by a dull thud as of a heavy body falling on the ground. The single vibration distinguishes it from an earthquake, which consists of a series of waves. The origin of the shock is to be looked for, not in the ordinary fall of hanging, however large that may be, but in a slight sudden subsidence of an enormous mass of ground, probably weighing millions of tons, either along a fault plane or over pillars which it crushes in. In the latter case, the weight is usually unequally distributed, and falls specially heavily on one or more pillars in the excavated area. These collapse or punch into the footwall, and the release of strain causes the shock. The occurrence is precisely similar to that of a solid subjected to crushing in a testing machine, and anyone who has watched the breaking of a cube or piece of solid rock or coal in a testing machine and the tremors which vibrate through the testing machine as the test-piece ruptures will have a likely picture of what happens on the grand scale when a large pillar of solid rock is crushed by a superincumbent mass of rock weighing millions of tons. Some of the occurrences known as air-blasts probably have a similar origin, but I think the majority are due to the fact that the weight at great depths, and still more largely the tectonic pressure, which has in the past caused the tilting, folding and faulting of the strata, have induced a condition of strain in the rock at certain places simliar to that in rapidly-cooled glass. When a free surface is exposed by mining operations, the mass has a tendency to crack and disrupt suddenly. Smaller pieces fly off, and are projected for some distance, while even large masses are occasionally dislodged. Serious accidents have resulted therefrom, and these are likely to increase with the increasing depth of mining, but depth is not the only determining factor, and the occurrence will always be more severe and frequent in some localities than in others. A peculiarity of several of these occurrences has been the fact that the mass breaks up into comparatively small fragments, somewhat in the same way as a Rupert's drop breaks up into dust when the tail is broken off.

FEBRUARY'S EARTHQUAKES.

These mining shocks were the subject of complaint some years ago, and a seismograph was erected at Ophirton by the Mines Department to measure their intensity. Records of a large number have been secured, but the amplitude of the vibration has never exceeded one millimetre. The earthquake which took place on the 20th February, 1912, showed a maximum amplitude of 11 millimetres on the same instrument, and was therefore many times as intense as the mining shocks. It did not, however, cause any damage, and was, in fact, hardly noticed by most people, largely perhaps because it was unattended by any noise. The mining shocks will, therefore, have greatly to increase in severity before any serious damage may be expected to result, and I do not think any alarm on that score is at present justified. Obviously, however, the excavation of large areas of ground, and the deposition of millions of tons of tailings on confined areas on the surface, has resulted in bringing the ground overlying the reef slightly on the move.

SHORT-SIGHTED POLICY.

In particular areas, and in the neighbourhood of shafts at which the necessary pillars have been either partially or entirely removed, the effects have been very noticeable, and have taught some companies that such a short-sighted policy has to be dearly paid for. The introduction of the method of water-borne sand-filling came not a moment too soon to enable some of these faults to be remedied. Hitherto no attempt has been made to determine the changes of level that are taking place on the Rand due to the moving of ground over undermined areas. I am attempting to get some information on this subject by means of some accurately-levelled cross-sections across the reef. It will be some years, however, before any considerable body of data can be expected. In concluding my address, Mr. President, I have to thank you and those present for listening so patiently to me on a rather dry subject, and also for the honour accorded to me of being your honorary president, an honour which I have highly appreciated. (Applause.)

DIVIDEND ANNOUNCEMENTS OF THE WEEK.

Brakpan Mines Makes a First Appearance.

The following is a further list which comprises dividends of mining companies for the first half of the current year, which have been announced since the date of our last issue. The complete list will appear later:—

Companies.	Issued Capital.	Rate %.
Knights Deep	£643,526	12½
Simmer and Jack	3,000,000	7½
Apex Mines	300,000	5
New Kleinfontein	970,000	7½
Rooiberg Minerals	180,000	7½
Durban Roodepoort Deep ...	440,000	5
Rose Deep	700,000	22½
Geldenhuis Deep	585,753	10
Crown Mines	1,880,212	55
Rand Mines	2,125,996	110
May Consolidated	288,750	15
New Unified	250,000	10
New Primrose	325,000	25
Ginsberg	210,000	15
Premier (Deferred)	160,000	300
Brakpan Mines	750,000	15
Robinson Deep	1,000,000	15
Jupiter	1,014,200	2½

Native Labourers Employed.

The report presented at the monthly meeting of the Transvaal Chamber of Mines contained the following:—The returns supplied by the Witwatersrand Native Labour Association, Ltd., show the following results for the month of May: Number of natives employed by members of the Association on last day of month (including natives in the service of mine contractors, but excluding natives in the employ of members of the Association in the districts of Barberton, Breyten, Rooiberg and Louis Moore):

	April.		*May.*
On gold mines	197,937	......	193,829
On coal mines	8,364	......	8,460
On diamond mines ...	13,785	......	14,538
	220,086	......	216,827

The W.N.L.A. also furnishes the following information with regard to the natives recruited by the Association and its members during the month of May and the districts whence they were obtained. These figures do not include natives recruited by mine contractors. The corresponding figures for the month of April are given for the purpose of comparison:

Source.	*April.*	*May.*
East Coast—South of latitude 22 deg. S.	2,789	2,193
Cape Province	3,401	2,819
Transvaal Province	877	663
Basutoland and O.F.S. Province	1,336	1,055
Bechuanaland	411	236
Natal Province	421	450
Swaziland	135	252
Rhodesia (including via Pietersburg) ...	201	128
Local	8,642	7,726
	18,216	15,822

The monthly report issued by the Department of Native Affairs shows that at April 30th, 324,684 natives were employed in labour districts of the Transvaal. Of this number, 231,205 were engaged on mines and on the various classes of works specified in Part I. of the Coloured Labourers' Health Regulations, 1906, and 93,479 were in other employ.

Swaziland Tin.

The Swaziland Tin, Ltd., has declared dividend (No. 11) of 5 per cent. (1s. per share) for the half-year ending 30th June. The dividend is payable to all shareholders registered at 30th June.

Benoni Consolidated.

The following cable has been despatched to the London offices of the above company: "Final clean-up from the works has produced 1,840 ounces fine gold, of an estimated value of £7,667. In addition to this, the manager estimates that the plates have absorbed 400 ounces of gold."

Premier Diamonds.

A dividend on deferred shares of 300 per cent., equal to 7s. 6d. per share, has been declared by the board of the Premier (Transvaal) Diamond Mining Company, Ltd., payable to shareholders registered at the close of business on the 29th June, 1912.

Congo Diamonds.

It is reported by H.M. Consul at Boma, Congo State that diamonds appear to have been found on Kasai River for about 75 miles, chiefly at a point about 55 miles north-west of Mai Munene, at the mouth of the Kabambaie Creek. Stones are reported as being abundant, and occur in small pot holes in the river bed or in sand banks. As many as fifteen diamonds have been extracted from one-fifth of a ton of gravel, but none so far have been found weighing over one carat. The majority of the stones are water-white in colour.

Rhodesian Section.

LATEST DEVELOPMENTS.

A Big Width at the Falcon—Sensational Strike in Mashonaland—Lonely Reef Returns—New Found Out Developments—The Rhodesia G.M. & I. Co.—Better Profits at the Rezende—A Mill for the Kimberley Mine—Position at the Yankee Doodle—The Giant Quarterly Report.

Development at the Falcon mine is proceeding satisfactorily. In the south crosscut, excluding a "horse" of ground, the reef is 40 feet wide to date, and the average reduced assay value per ton is 54 shillings. Moreover, the reef is still in the face. The Falcon has all the makings of one of the largest propositions in Rhodesia, and should be capable of maintaining a very large plant. Considering its excellent prospects, it is rather remarkable that the mine was not brought to the producing stage some years ago.

* * * *

A sensational discovery has been made in the Enterprise district. Rhodesian contemporaries have described this find as a phenomenal strike, and "possibly the biggest in the world" (according to one Salisbury paper), on the Uno claims in the Enterprise district. The claims are located on Mr. Zimmerman's farm, about a mile north-east of the Planet-Arcturus. The property, which has been several times pegged and abandoned, is now held by Messrs. P. J. Finucane, M. D. Roche and W. H. Wells. The strike, which has been opened up for about 200 yards, is said to disclose a well-defined reef of from 30 to 50 feet in width, and shows values, from pannings, up to four ounces. There seems to be no outcrop, the reef having been unearthed on the summit of a hill. The formation is schist. At first, people in Salisbury were inclined to ridicule the report, but that there is some amount of truth in it seems to be tolerably certain. That a reef has been found of these dimensions, and containing the values stated, is vouched for by a mining man of large experience—but in no way interested in the property—who has carefully examined it; and he is of opinion that, from the nature of the strata disclosed, the reef is at any rate not merely a "blow." He thinks, moreover, that it will be found that the reef goes down, and probably expands in depth, but whether the values shown at surface will continue can, of course, only be determined by further work, which is being vigorously proceeded with. Phenomenal strikes of the nature mentioned have been heard of before, and the utmost caution should be observed in accepting statements such as these above set forth. At present all that can be safely said is that the discovery has caused much excitement in the neighbourhood, and that there is apparently a certain amount of truth in the statements circulated regarding it.

* * * *

The following is a summary of the consulting engineer's quarterly report on the Lonely Reef to March 31st: Development work, 1,265 feet; tonnage developed, 15,584; making a total of ore in sight, 148,738 tons, calculated over average width of reef, plus 12 inches waste rock; average value ore reserves, 1 oz. 2 dwts. 21 grs. Total estimated profit in sight, £487,376, made up of profit on ore reserves £484,458, profit on treating accumulated tailings, £2,918. Mill ran 79·24 days, crushed 7,190 tons, gross yield 6,790 ozs. Accumulated slimes, tons treated, 4,669, yielding 1,449 ozs. Total output, 8,239 ozs. fine gold, equal to 1 oz. 2 dwts. 21 grs. per ton milled. Development footage smaller than previous quarter; driving delayed during timbering levels for stoping. Low tonnage due to temporary breakdown, one tube mill—since repaired. The following are results of development work carried out during month of April: No. 7 level south drive 595 to 640 feet, average width of reef is 27 inches, assaying 13 dwts. 1 gr. No. 8 level north drive, 5 to 15 feet, average width of reef 38½ inches, assaying 2 ozs. 14 dwts. 15 grs. South drive 15 to 35 feet, average width of reef 43·25 inches, assaying 2 ozs. 3 dwts. 12 grs. Average width of reef throughout No. 8 level is 45½ inches, assaying 1 oz. 17 dwts., over total length of drive.

* * * *

The following is a summary of a report on the New Found Out mine which was recently sent to London by mail: Footage for the half-month (April), 31 feet. No. 3 level: Main drive south continued from 151 feet to 172 feet. No. 6 level: Winze sunk from 88 feet to 90 feet, crosscut at 90 feet down to footwall started now in 4 feet, samples taken assay as follow: Hanging-wall 10 inches, minerals 3·2 dwts., 12 inches dyke matter 1·2 dwts., 36 inches mineral 22 dwts.—footwall mineral 16·4 dwts. Drive north of winze at 90 feet down—drive started now in 4 feet, mineral of very good appearance.

* * * *

The report of the Rhodesia Gold Mining and Investment Company, Ltd., for 1911 states that the operations for the past year show a net realised profit of £6,217, but there is, in addition, a very large unrealised profit if the share interests of the company are taken at their market valuation on December 31st last. The directors, being of the opinion that the intrinsic value of the company's shareholdings is considerably higher than has been reflected in the current market prices ruling during the year, have deemed it wise to refrain from realising any large number of shares at these prices.

* * * *

The latest information in regard to the Rezende mine is exceptionally encouraging, and the profits of the past month constitute a record. Mr. Archibald Little, one of the directors of the Rezende and Penhalonga mines, and the representative of Messrs. Farrar Bros., has just concluded a visit to the property, and has left for London via Johannesburg. It seems that the gold dredging scheme on the Umtali River, which principally caused him to come out, has been abandoned as impracticable, for, apart from any question of the gold contents, the deposit or bed is found to consist chiefly of clay to a depth of some 12 feet, and this material is, of course, quite unsuitable for the purposes of dredging.

* * * *

On the advice of their consulting engineer, the directors of the Kimberley (Mashonaland) Company have authorised the immediate purchase of a reduction plant of a capacity of 3,000 tons monthly. The present development of the mine shows an ore reserve of three years' supply for the mill, and development in the lower levels continues satisfactory.

* * * *

Work on the Yankee-Doodle mine, the property of the Selukwe-Columbia G.M., for the month of April, resulted in a loss. The value of the output was £3,797, and the working costs came to £4,042. The mill ran only 17 days during the month, and this is now explained as being due to the short supply of water. The London board has issued a statement to the effect that a pipe-line has now been laid from another source of water, and that henceforth the mine will be provided with a permanent and sufficient supply.

* * * *

The Giant quarterly report for the period ended March 31st gives the following particulars:—Mine: 708 feet driven, sunk and risen; ore developed at January 1st, 1912, 270,000 tons; ore crushed, 33,163 tons; ore in sight at March 31st, 1912, 236,837 tons. Mill: An average of 30 stamps and two tube mills ran 85·585 days. Tons crushed, 33,163 tons; tons crushed per stamp per diem, 12·916 tons; yield per ton treated, 7·573 dwts. Expenditure: Mining, £9,734; development redemption, £3,178; milling, £6,096; crushing and transport of ore, £1,292; general expenses at mine and Salisbury, £2,701. Value per ton crushed, £1 12s. 1·524d.; fine gold produced, 12,558 ozs.; value, £53,271. Estimated working profit, £30,265 (or 18s. 3·033d. per ton). Capital expenditure: Amount spent during the period on account of mine development (including boring operations), machinery and plant, etc., £2,987. Recent advices from the neighbourhood of the mine indicate more promising developments in the matter of the search for the lost ore body.

Rhodesian Railways.

The report of the Rhodesia Railways, Ltd., for the twelve months ended September 30th states that the extension of the line from Elisabethville, in the Belgian Congo, to the Kambove mine, a distance of about two hundred miles, by the Compagnie du Chemin de Fer du Bas Congo au Katanga, is making satisfactory progress. The route of a branch line from Umvuma to the Victoria district is now being surveyed, and it is anticipated that arrangements will be made for the construction of this line at an early date. The net earnings of the company's system were £618,192, an increase of £191,148. The net revenue for the six months ended March 31st last, as compared with the same six months in the previous year, increased by £72,001 and £43,964 respectively, but these results show a falling-off as compared with the previous six months.

The report of the Mashonaland Railway Company states that a contract for the extension of the Mazoe branch line to the Kimberley and Shamva mines has been entered into, and construction work is now proceeding. The Beira Railway Companies have under consideration the construction of more extensive wharf accommodation at Beira than was originally contemplated, in order to meet the increased volume of traffic at the port. The net earnings of the Beira-Salisbury section for the year ended September 30th were £380,351, an increase of £88,928. As compared with the same six months in the previous year the gross revenue for the half year ended March 31st last has increased by £19,981, but recent advices from the general manager are to the effect that there has been a slight decline in business at Salisbury, and a considerable falling-off in the volume of traffic for the Belgian Congo. The working expenditure shows a substantial increase, which is principally due to the higher standard of maintenance of the permanent way. The net earnings of the Kalomo-Broken Hill extension for the year ended September 30th were £53,527, an increase of £27,386. The approximate figures for the first six months of the present financial year are £29,907. The receipts of this section, which depend very largely upon the activity in the Katanga mining districts, have temporarily diminished, and it is not anticipated that the satisfactory results obtained during these six months will be maintained for the whole year. The net receipts from the Lomagunda and Eldorado branches decreased during the year by £3,402 to £5,832. The approximate net earnings for the first six months of the current financial year are £1,675. The general manager reports that the condition of the permanent way, locomotives and rolling stock on this branch is not satisfactory, and the question of converting the line to standard gauge is receiving consideration.

High Mining Salaries

EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings; Box 2061.

Bucks Reef Gold Mines.

The following are particulars of last month's output of the Bucks Reef mine, viz.: Tons crushed, 720; yield, £2,533 12s. 4d.; profit, £621 3s. 4d.

Deepest Gold Mine in the World.

The "Town and Country Journal," in answering a correspondent, says:—"The deepest gold mine in the world was, until lately, that of the New Chum Railway Company, at Bendigo, Victoria, Australia. The New Chum shaft is 4,120 feet deep. It has lately been surpassed in depth by the shaft of the Victoria Consolidated Company, also at Bendigo, sunk to a depth of 4,600 feet. More recently the record depth for gold mines has passed from the hands of the Australians, and is now held by the British St. John del Rey Gold Mining Company, operating in Brazil. At the Morro Velho mines of this company, in the State of Minas Geraes, the 16th level is 4,226 feet deep, the present lowest level, the 17th, is 4,926 feet in vertical distance below the collar of the main shaft and 4,602 feet below the adit. The Morro Velho ore-body dips, roughly, 45 degrees, so that the workings extend downward along the reef a distance of nearly 7,000 feet. The deepest American gold mine is believed to be the Kennedy shaft at Jackson, Cal., the workings of which are approximately 3,500 feet below the surface. The world's deepest mine, however, is No. 3 shaft of the Tamarack Copper Mine, which is down 5,222 feet, or 58 feet short of a mile; but some crosscuts and slopes bring the bottom of the working down to a total depth of 5,368 feet below the collar of No. 3 Tamarack shaft. As the copper-bearing Calumet conglomerate dips about 38 degrees, the lowest Tamarack No. 3 workings are nearly 9,000 feet distant from the outcrop of the conglomerate.

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ASSAYER seeks situation on Gold Mine, outside district; also experienced in amalgamating, cyaniding, smelting and general mill work, etc.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Aluminium and Its Alloys.

To the Editor, *South African Mining Journal.*

Sir,—In your issue of June 15th you published in your correspondence a letter from Mr. A. Vivian Hussey, Chief Chemist to the Aluminium Corporation, Ltd., Dolgarrog Works, Tal-y-Cafn, North Wales, in which he criticised three points of the report on my new alloy, Argilite, which appeared in your issues of April 13th. He says: 1st: That I have overlooked the fact that pipes and pipe lines can be quite as readily made with solid-drawn aluminium tubes, which, compared with cast tubes, show economy both in weight and cost price. In answer to this question of economy, I will say: What does the Aluminium Corporation charge now for worked aluminium, with which the tubes mentioned above are made? Because, a few months ago, on enquiry in England and France, the prices quoted to me for worked aluminium were about 50 to 100 per cent. more than for cast aluminium. So I do not think that, for a manufacturer buying the metal, he will get more profit in using worked aluminium than my cast alloy; besides, all pipes, fittings, pumps, machinery, etc., cannot be made from worked aluminium with an autogeneously welded process. 2nd: Of the resistance to pressure of worked aluminium, he says that there are several tanks both for pressure and vacuum in use made from worked aluminium, and by the welding process, of varied capacities up to and over 2,500 gallons, and tested to 50 lbs. per square inch. Mr. A. Vivian Hussey would oblige me by letting me know what thickness would be required for pipes made in worked pure aluminium, with the welding process, to resist a head-pressure of 2,000 to 5,000 feet resistance required for the mines of the Rand. It is a fact known that under a head of 578 feet = a pressure of 250 lbs. per square inch, water has been forced through a cast-iron pipe of five-eighths to three-quarters of an inch in thickness—pressure by which the Argilite is not affected. 3rd: To the third and last criticism, that the cost price at the factory of £20 per ton is totally inaccurate, I would have wished that Mr. A. Vivian Hussey had said "In our factory," instead of all the factories generally. Indeed, can the Aluminium Corporation, Ltd., Dolgarrog Works, North Wales, manufacture aluminium at the same price as the Heroult Societé Electro-Mètallurgique of Frosges (Frére), France, established in 1888 for the manufacture of aluminium and silicium with the Heroult-furnace Society, which can dispose of 70,000 hydraulic h.p., and is the owner of the largest deposit of Bauxite, the same society selling alumina to the manufacturer of aluminium? Mr. A. Vivian Hussey thinks, perhaps, that the Heroult Society was selling cast aluminium at a loss when it was quoted to me £54 the ton, before the established trust with the Aluminium-Francais in March last. Mr. A. Vivian Hussey knows very well that cheap and pure raw material and extraordinarily low price of electric energy greatly condition the result, which could hardly be attained elsewhere.—I am, etc.,

PROF. G. JACQUIER, B.Sc.,
Patentee of the Non-Corrosive Metal, the Argilite.

Rand Geology.

To the Editor; *South African Mining Journal.*

Sir,—From the days of Molengraaff and Kuntz to the present time I have persistently drawn the attention of the Geological Survey to many grave errors of omission and commission which, in my opinion, makes their work practically valueless to the prospector or budding geologist in search of any particular one of our four auriferous geological ages, or the series thereof, as they are all so hopelessly mixed that the whole of the work will have to be revised and rewritten to be anything like correct. Our only hope of getting these mistakes altered is when it is translated into the "taal"—as it must shortly be under the Hertzogian edict—for then it will be useless telling the Boers, who are, perhaps, the best prospectors in the world, that the Pretoria series, for instance, is identical with the Gats Rand, south of the Rand; or that the Lydenburg dolomites are the same as the Black Reef dolomites, and so on, as they will raise their voices of one accord and say, what Nature hath joined together let no geologist put asunder! Perhaps the greatest error of all, from an economic point of view, is the Survey's insult to our "Cinderella"—Black Reef Series—by corollating it with the wretchedly poor conglomerates of the Lydenburg age, which encircles the Union, and reaches to Timbuctoo—and further too. We have quite enough Black Reef series, North, South, East and West, and overlying Main Reef series, without tracing it, on paper, up to Haenertsburg, via the Devil's Kantoor, to perpetuate the fossilised theory of an early day crank. It is enough to make one exclaim, "Where are they going to take it next!" Our Black Reef series ranks as first-class banket, and not the common or garden conglomerate, of which the great ugly lower bed of Lydenburg is composed.

The Geological Society, by its silence, apparently passes the above inexactitudes as being correct, but they get on the nerves of your humble servant, who, were he in a wilderness, would feel compelled to cry out against them, for posterity's sake. Little harmless stratigraphical errors, such as the "West Rand Unified," dubbing their mile or so of typical underlying beds of Black Reef series, "Main Reef series," in your last issue, is not worth craving space in your widely-circulated journal to refute; but when vital geological errors are persisted in, and bear the Government stamp, I feel it a duty, with my ubiquitous knowledge of the subject, to protest, and not quietly acquiesce like the rest of "the brotherhood," as Mr. Lewis Watkins puts it.—I am, etc.,

SCOTT ALEXANDER, Rand Stratigraphist.

Johannesburg, June 19.

[The Geological Society and all who have made a study of the question in the field are unanimous, we think, in accepting the identity of Lydenburg and Black Reef dolomites. It would be astonishing if they were not. With regard to the West Rand Unified bankets it may be pointed out to Mr. Scott Alexander, that undoubted Black Reef is found overlying the section given in our last issue, and dipping eastwards at about 40 degrees.—Ed., S.A.M.J.]

The Meyer and Charlton.

An interim dividend of 25 per cent. (No. 45), equal to 5s. per share, has been declared by the board of directors for the half-year ending June 30, 1912, payable to all shareholders registered at that date, and to holders of coupon No. 28 attached to share warrants to bearer.

Rand Klip.

The following is a copy of a cable despatched to the London offices of the Rand Klip, Ltd., this week: "Referring to our telegram of 10th, average all check samples width 54 inches, value 2·18 dwts. Station and sump in progress; driving on reef will commence in a month or six weeks."

May Consolidated.

A dividend (No. 28) of 15 per cent. (3s. per share) has been declared, payable to all shareholders registered in the books of the company at the close of business on Saturday, June 29, 1912, and to holders of coupon No. 28 attached to share warrants to bearer.

Brakpan Mines.

An interim dividend (No. 1) of 15 per cent., equal to 3s. per share, has been declared by the board for the half-year ending June 30, 1912. This dividend will be payable to all shareholders registered in the books of the company at the close of business on June 29, 1912, and to holders of coupon No. 1 attached to share warrants to bearer.

THE WEEK IN THE SHAREMARKET.

Ending Dull and Easier—Little Doing.

Despite the satisfactory dividend announcements, the market continues dull and uninteresting. Business sagged during the week, and on Thursday very little was done. There is no doubt that things are ripe for a rise in prices, and at the most unlikely moment in the next few months we may see a resumption of activity. Tin stocks continue to provide the chief feature of interest, and should prove quite exciting counters in a good general market. Diamonds are quiet, but one or two new flotations are spoken favourably of. For the present, however, everything waits on the general market and that waits on London.

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	Friday, 14th	Sat., 15th.	Monday, 17th.	Tuesday, 18th.	Wed., 19th	Thurs. 20th.
African Farms ...	16 0B	16 0B	16 0B	16 0	16 9B	15 6B
Adair-Usher Process	-	1 9B	1 6S	1 3B	1 6S	1 0B
Apex Mines ...	34 9B	...	35 0B	34 0B	33 0B	32 6B
Bantjes Consolidated	24 6	24 3B	24 0B	24 6B	24 0B	24 6B
Benonis	6 3B	6 1B	6 4B	6 3B	6 3B	6 3
Bushveld Tins ...	1 3B	1 3B	1 3B	1 2B	1 3B	1 3B
Brakpan Mines ...	78 6	78 6	78 9	...	78 0B	77 0B
Blaauwbosch ...	22 0B	22 0B	22 0B	22 0B	22 6B	21 0B
British S A. ...	26 6B	27 6B	26 0B	...	..	...
Cinderella Cons. ...	22 6B	23 0B	...	...	...	...
City and Suburban ...	54 3	53 6B	54 0	53 0B	53 0B	53 3
City Deeps	57 0B	57 0B	57 0B	57 0B	57 0B	56 0
Cloverfield Mines ...	6 4	...	6 1	6 3S	5 6B	6 0S
Cons. Langlaagtes ...	23 0B	23 3B	23 0B	23 0B	23 3	23 0B
Cons. Main Reefs ...	20 0	19 9B	19 9B	19 9	19 6	19 3
Coronation Freeholds	0 6B	...	...	...	0 6B	...
Con. Investment ..	21 0B	21 0B	21 0B	21 0B	20 0B	...
Concrete Cons. ...	9 0B	...	11 0S	7 6B	..	...
Clydesdales	10 0B	10 6B	10 6B	11 6B	12 6	11 6B
Cons. Mine Selections	13 0B	13 0B	13 0B	13 0	13 3B	13 0B
Crown Diamonds ...	...	5 0S	...	5 0S	...	...
Crown Mines	143 6	...	140 0B	140 0B	...	...
East Rand Cent. ...	11 0	11 0B	11 0B	11 0	11 3S	10 6B
East Rand Coals ...	2 4B	2 4B	2 4B	2 4B	2 4	2 4B
East Rand Deeps ...	2 5B	..	...	2 6	...	..
East Rand Props. ..	61 9	...	...	...	60 6B	60 0B
East Rand Deb. ...	..	...	£94	...	£94	...
Eastern Gold Mines	1 10B	1 9	1 9B	1 9B	1 10B	1 10
Frank Smith Diam ..	...	...	...	...	8 0B	...
Govt. Areas... ...	26 9	26 0	25 0B	25 0	24 0	25 0
Glynn's Lydenburgs	22 6B	...	22 6B	22 6B	22 6B	22 6B
Geduld Props. ...	24 3B	...	23 0B	23 0B	...	...
Ginsbergs	..	...	28 0B	...	...	...
Glencairns	...	5 0S	...	5 0S	5 0S	...
Glencoe (Natal) Colls	6 6S	6 6S	6 0S	6 0B	...	6 3S
Jumpers	—	...	...	—	...	...
Jupiters	10 9B	11 3	11 3B	11 0B	11 3B	11 9S
Kaalfontein Diamonds	0 6B	0 6B	0 6B	0 6B	0 6B	0 6B
Klerksdorp Props. ...	3 3B	3 3	3 0B	3 0B	3 0	...
Knight Centrals ...	15 0	14 9B	14 9	14 6B	14 6B	14 6B
Luipaardsvlei Estates	8 0B	...	7 9B	...	7 9B	.
Lace Props.	3 6B	...	3 6	..	8 3B	3 3
Lydenburg Gold Farms	2 9	2 6B	2 6B	2 6B	2 7B	2 6B
Main Reef Wests ...	26 3B	25 3B	25 6B	26 5B	26 6	26 6B
M.R. West Deben...	£99 10B	...	...	...	..	...
Modder B's	...	58 0B	58 6B	58 0B	57 6B	58 6B
Midas Deeps ...	0 6	0 6S	0 6	0 4B	0 6B	0 5B
Middelvlei Estates...	1 11S	1 6B	1 6B	1 6B	1 6B	8S
Modder Deeps ...	31 3B	31 0B	31 0B	30 6B	30 0	...
Meyer & Charltons...	91 0B	92 6B	..	92 6B	...	...
Natal Nav. Colls. ...	...	...	...	...	...	...
New Eras	8 6	8 0B	...	8 3B	8 0S	8 3S
New Kleinfonteins ..	...	...	28 0B	28 3B	28 0B	...
New Rietfonteins ...	...	...	10 0S	...	9 3S	9 3S
New Unifieds ...	...	18 0B	...	18 3B	...	18 3B
New Boksburgs ...	1 9B	1 9B	1 9B	...	1 11B	...
Nigels	...	...	..	..	..	17 6B
Orange Diamonds ..	1 4B	1 4B	1 3B	1 4B	1 4B	1 4B

B Buyers. S Sellers.

	Friday, 14th.	Sat., 15th	Monday, 17th.	Tuesday, 18th	Wed., 19th	Thurs. 20th.
Premiers Deferred	188 9B	...	...	...	191 3B	—
Pretoria Cement Co.	57 6B	55 3	55 0B	55 0B	57 0S	56 0S
Paardekraal Estates	0 8B	0 6B	0 9B	0 3B	0 8B	...
Potchefstroom Est....	1 6B	..	...	1 4B	1 0B	...
Princess	10 0B	9 0B	10 0	10 0B	...	...
Rand Nucleus ...	3 0	2 11B	2 11B	2 11B	2 11B	2 11B
Randfontein Estates	28 9B	28 6B	28 0B	27 9B	27 9B	28 3
Randfontein Deeps ..	4 0B	4 0B	4 0B	4 0B	4 0	4 0B
Rooiberg Minerals ..	36 9	36 6	36 9S	35 3B	34 3B	34 0B
Rand Klips	6 6B	6 3	5 10	4 9	4 6	4 6
Ryan Nigels ..	...	...	4 0B	3 9B	..	..
Rood. Durban Deeps	26 0B	28 0S	26 0B	25 0B	26 0B	...
Robinson Deeps ...	...	...	36 9S	...	50 0B	...
Swaziland Tins	...	...	...	...	37 0S	...
Salisburys	...	3 6S	...	5 0S	...	...
Simmer Deeps ...	3 0B	...	4 0S	4 0S	3 3B	...
South African Lands	4 6	4 4B	4 4B	4 4	4 4	4 3B
S.A. Tin Mines ...	...	—	7 6B	...	7 6B	...
S. Randfontein Deeps	3 6B	3 6	3 6B	4 0S	..	3 3B
Sub Nigels	5 3B	5 3B	5 0B	...	4 9	...
S. A. Breweries ...	...	...	..	...	..	40 0S
Springs Mines ...	16 0	15 9B	15 9B	16 0B	15 9	15 3B
Trans. G.M. Estates	47 0B	47 0B	47 0B	47 0B	...	46 0B
Temple Tins ...	...	...	...	...	...	...
Trans. Coal Trusts...	48 6B	48 6	48 9	48 3B	48 6B	48 9S
Trans. Cons. Lands	30 0B	30 0B	30 0B	30 0B	30 0	30 0B
Tudors	...	2 0S	1 0B	...	...	1 0B
Van Ryn Deeps ...	19 9B	20 0	19 6B	19 3B	18 6B	18 9B
Village Deeps ...	41 6B	41 6B	41 3B	41 3B	41 3B	41 0B
Vogel. Cons. Deeps...	1 0B	1 0B	...	1 0	0 10B	0 10S
Voorspoed Diamonds	...	..	...	...	...	9 0B
Van Dyks	2 0B	2 0B	2 0B	2 0B	2 0B	...
West Rand Con. ...	...	...	...	...	...	...
Witwatersrands ...	55 0B	55 0B	55 0B	55 0B	...	...
Wolhuters	20 3B	...	20 0B	20 0B	20 0	20 3B
Witbank Collieries...	40 0B	...	40 0B	...	...	...
Wit. Deeps	53 6B	56 0S	53 6S	51 3B	50 0B	..
West Rand Est. ...	2 6B	2 6B	2 9	...	2 6B	...
Zaaiplaats	48 0	40 0B	48 6	48 0	46 0	45 6B

B Buyers. S Sellers.

MINING MEN AND MATTERS.

Mr. Samuel Evans has been appointed a representative of the Chamber of Mines on the Governing Body of the Johannesburg Trades School.

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The following change in representation on the Chamber of Mines has taken place: E. Friedlander & Co., Ltd., Mr. Max Ullmann *vice* Mr. E. Friedlander.

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Mr. C. B. Kingston's agreement to act as consulting engineer to the Rhodesia Gold Mining and Investment Co. expires on June 30th next, and he is to be succeeded by Mr. Francis Drake, M.I.M.M., another engineer of high attainments and considerable business capacity.

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Mr. H. Harger presided at the monthly meeting of the Geological Society of South Africa, held last Monday night in the Council Chamber of the Chamber of Mines. Various papers were read, including one by Dr. Paul Range on "Topography and Geology of the German S.-W. Kalahari"; another by Mr. D. P. McDonald, M.A., B.Sc., "Note on a Specimen Containing Bastnasite and Wolframite from Welgevonden No. 777"; and a third by Mr. C. Baring Horwood, B.Sc. (Lond.), "Note on the Relationship between the Black Reef Series and the Underlying Diabase."

Electrical Notes.

THE DESIGN AND INSTALLATION OF TRANSFORMERS FROM AN OPERATING POINT OF VIEW.*

[By Mr. C. W. R. Campbell, Past-President, S.A.I.E.E.]

My remarks are only intended to start an informal discussion, but I hope that members will contribute fully to it on the several points that are to be met with, and that I shall be allowed subsequently to enter into the discussion myself. I only intend to glance over the subject from a purely operating and chiefly mechanical point of view—the point of view that you do not often get in text books. On looking them up one rarely finds anything relating to the points upon which I wish to touch. I propose to deal chiefly with three-phase transformers, and I hope I shall not disappoint members who expect a highly theoretical discussion. I will first take the iron circuit of the transformer. I do not think from the operating point of view the shape or the disposition of the iron circuit matters very much; the important things are the various methods of securing the core and the yoke together. It is important to avoid, as far as possible, the inclusion of any of the supporting and tieing arrangements in the iron circuit itself. That invariably leads to trouble sooner or later. There are numerous devices. I have had experience of a good many transformers, small and large, in this country, depending a good deal for alignment of the yoke on small dowel pins set between the faces of the yokes and the limbs. That is, I think, a very wrong practice, because it invariably happens in transport or erection that they get slightly out of line, and I have seen these dowel pins fuse up in the iron in four or five cases through local heating. A far better arrangement for securing a proper alignment is the method of having a good deal thicker plate on the outside of the yoke overlapping the limb slightly or vice versa. Of course, in the design of the transformer, as a whole, one has to consider how far they may overlap. The space allowable for the coil when the plate is on the yokes has to be considered. Then, in holding the yoke down to the limbs there are many methods used. I think the principle of angle iron running the whole length of both yokes, and held together with long bolts is really incorrect. It may be cheap, but it is wrong. I think by far the best method is a cast-iron cap over the whole of the yoke. In considering core and shell type transformers, in the core type, connections can be very readily brought out, and when brought out, the ends of the connections can be led quite clearly away from the actual windings. In the case of the shell type, it is necessary to bring them up from all points, generally above the transformer. Consequently, with any trouble in connections or any of the various arrangements above the transformer for making tappings, molten copper and such like drops inside or between the coils, which is very difficult to clear. This may not give trouble at the moment, but sooner or later it is bound to. That, I think, is a failing with a great number of shell type transformers. With regard to the coil itself, a very important point is the method of holding the coil in place, especially with loads that are liable to change very rapidly, such as hoisting loads. Coils can move very easily under those circumstances, especially if not exactly centred in the first place. A method to be avoided, and one which is commonly used in three-phase transformers (being a cheap method) is to run along the top of all the coils at each side an angle or tee iron, and, of course, along the bottom in the same way, the angle irons being bolted together by long bolts passing between the coils, two on each side. All insulating materials are not of exactly the same thickness, and it is impossible by that means to tighten up all the coils to the same degree. If the slackest coil is to be firmly secured, the remainder are bound to be overstrained. The best method is to secure each coil separately by means of a cast brass or gun metal cover of open design, carefully designed so as to produce no eddy currents, or as few as possible. In that way one can treat each separate set of coils as one unit, which is extremely important. In assembling the coils on the limb, from an operating point of view, I think there is no doubt that the simplest and best method is the sandwich method. The concentric method—the method often adopted—with the low tension inside the high tension, leads to overcrowding as a rule where the terminals are brought out, and especially in those cases where the low tension coils are wound in several sections and perhaps parallelel outside. The concentric method always improves the arrangements for bringing the ends out and arranging them in any manner one likes. With regard to the shape of coils, I feel strongly that the most useful shape is a circle, from all points of view. It is far easier, especially in a country like ours, to rewind a transformer that has its coils circular. From the manufacturing point of view, however well those coils are made, they are always weaker at the corners when in square or oval section. The importance of considering the bringing out of coils to avoid awkward connecting up is not always considered by manufacturers. It is extremely easy in a factory to assemble the transformer, to bring out the end turns and make all sorts of weird angles in the connections, but it is extremely difficult to the operating man to follow out all these things after a serious breakdown, when the whole thing looks like a mass of seaweed. I have had a case where it was impossible to trace the thing at all until one transformer was obtained which was supposed to be similar. All end turns should be brought out so that all connections can be made straight, either horizontically or vertically, except those connections between sets of coils which must, in many cases, go at an angle. Various connection schemes are more useful, I think, than are generally considered. I do not see that from the manufacturing point of view, it is a difficult matter to make every 2,000 volt transformer that is turned out, a 500 volt transformer also. It would be an extremely useful thing if this were arranged. These seem, more or less, standard voltages, and it is useful to be able to change over whenever one wants. It need not necessarily be done above the oil; it can be done under the oil, because if one has a change like that to make there is always sufficient time. It may be considered whether it is always necessary to bring end connections up out of the oil. I see very little use, as a rule, for that. There is usually plenty of time, and the alternative considerably simplifies the transformer connections and improves it to a great extent from the mechanical standpoint. Most transformers which have numerous tappings have far too long end connections, and I recall transformers with the end connections nearly five feet long, only secured at the top, and soldered to the end of the coil, this end being left to look after itself. Sooner or later that ends in disaster. On breaking off it is sometimes lucky enough to come clear, but it frequently also makes a serious earth, and sometimes short-circuits to another lead. All end connections should be secured very soon after they leave the end of the coil in a very firm manner to the general structure of the transformer. With regard to the terminal question, it depends more or less whether one wants a series of tappings or not, but there is one point on which I seek enlightenment. I distrust very much indeed transformers for high tensions which have their terminal connections coming out horizontally in the side of the case. It is a common experience with transformers, in which the leads go in horizontally through the side, with a sharp bend down to the transformer, that any serious surging invariably leads to arcing from the lead inside to the case. This trouble is much rarer with transformers with leads straight through. There is one interesting point—this generally saves the transformer itself, but still it is annoying. The effect of the bend is, of course, a choking effect. With regard to various tappings, the use of terminal boards is, of course, common. The ends of the coil are brought up to a terminal board of some description or another, and cross connections made on this as required. In many cases these boards are of a somewhat fibrous material. This, I think, is a mistake, and in experience has proved itself so. The fibre, from the heat and the soaking in oil, warps, and all sorts of trouble in the end connections happen. Marble is a useful material, but it is extremely apt to crack in transit. I think myself that a fairly thick porcelain board properly moulded would meet the case extremely well. Holes could be made large enough for the bolts coming through, and also bushed to prevent breakage. The bolting and tightening up of the terminals, top and bottom, should be entirely independent of the porcelain. A bedding could be made on any iron structure quite satisfactorily. One point about end connections which, I think, is seldom noticed is the inadvisability of slotting the cross-bars. The ordinary cross-bar made with two holes for making a short connection is frequently slotted, in order to render it more convenient in changing over the connections, so that the bolts are simply loosened and the connections slipped over on to another nut. I have found this in practice to be very harmful, and on some connections one will get three or four of these slotted bars carrying the whole current of the transformer, with practically only about 25 per cent. to 30 per cent. of the total cross-section needed. I may mention that two or three terminal boards of fibre have been entirely burnt out without the slightest breakdown—no burning of the copper at all—merely through local heating. Fortunately, the diagnosis is quite simple with the thermometer. A useful method of bringing out end connections where several tappings are required is the concentric method. One connection will be a single bolt; then comes the insulation; then a cylinder; then insulation again; then another cylinder. These are all brought out at the top through a porcelain insulator. This is extremely useful, providing the insulating material is not skimped. It is not always useful though to have tappings outside. From the consumer's point of view it is practically useless. From a supplier's point of view it is often useful, because one may have to change the tappings in a hurry. If four transformers are on load, and three are required, that means there is only one transformer available to change. That is changed. Then the next operation is to change one more. That means that only two-thirds of the load can be taken while the work is being done, because the next operation would be to put the two in parallel again. They cannot be parallelel on different tappings. From a power station point of view, the outside method of tapping connections is extremely useful, and, I think, if properly designed the concentric method is the most useful and the simplest. Of course, it goes without saying that all tappings should be on neutral. I had a note about double-voltage transformers, but I think they are a nuisance in every respect and hardly worth worrying about. With regard to the case, it must be, in the first place, strong. In most cases they are simply of cast-iron, but where one deals with larger powers one must remember the question of radiation of heat, and the cast-iron case would be hopeless. The corrugations should be very deep—as deep as it is possible to make them. With regard to the oil, a great many cases now-a-days have outside wings for the oil to circulate in for cooling purposes. I do not know that it is very necessary. A really good oil-cooled transformer should be quite satisfactory in the ordinary case. The case should be as thin as possible, consistent with mechanical strength. An important point is the securing and fastening of the outside to the base, and it is important that the top of the case should be mechanically so strong and so well secured to the base that no damage will arise in lifting the case with the transformer and oil from the ground. I have seen many cases that would not bear that test. The cover is an extremely important thing. One used commonly is a sheet of iron dropped over the top with merely small angles to keep it in place. It is sometimes found that there is a considerable amount of deposit of dust inside, which is very undesirable. A small transformer can be readily handled with a cast-iron cover overlapping the sides, and that is satisfactory from all points of view; but in the case of covers that are oil-tight, an important point arises in that over the very large area that has to be tight, it is extremely difficult to get a satisfactory joint. In all covers that are oil-tight it is necessary, of course, to have an expansion chamber. Transformers of this type should have a stiff angle or channel iron running round the edge of the flat cover, so that it can be pulled up tight the whole way round. With regard to the method of keeping the transformer in its place in the case, in many cases there is merely a rough guide. Transformers have a habit of walking about in their cases! Some manufacturers provide in the bottom of the case, guides for two corners, one at each angle. That may be sufficient when the transformer is being put into its case, but it will not always remain central, especially in the case of noisy transformers, which wander around tremendously. I remember one transformer that in two weeks shifted two inches from the side of its case, and it could hardly be seen by a level that the case was out of level. There was no appreciable vibration of the ground near. In securing the transformer to the top, and to secure it vertically, in most cases two straps on each side are used, which are bolted by a small bolt to the side of the case. Of course, that ought to be all right when installed, but during transport it is useless. To make a sound job there should be no need for this. The structure holding all the coils and the iron and the end connections should be absolutely secure in itself, and if a sound arrangement on the base of the case was provided to prevent it moving, there would be no need for anything from the top except for the purpose of transport, when some temporary arrangement might be made—in fact, wood would be the best thing to use. With regard to transport many manufacturers fail. Transformers are generally carefully labelled "this way up." I hold that they should be built into their packing cases, so that they would not be damaged if laid on their side, except, of course, very large sizes. As a rule, if a transformer happens to be tilted, it is a hopeless business. A great deal to improve matters could be done in this direction. The oil question I do not propose to discuss. I feel that there should be a fairly large quantity, preferably the containing case should be tall and fairly narrow, regard being had to requisite clearances. Unless this is done, the method of providing wings is a most useful one. In the iron core I have frequently found excellent arrangements in the way of corners cut away to allow the circulation of oil up the side of the core, but most of that has been invalidated by the fact that the yoke covers them up. It is important that the yoke should allow free egress of the oil. In the case of concentric transformers, it is comparatively easy to allow sufficient space between the insulating bobbin and the coil and the low and high tension coils, to get sufficient circulation. The question is more serious in the case of the sandwich coils one on top of the other. One has to keep the high and low tension well separated. Egress must be allowed under the coil round near the limb and back over the top of the coil to the outside. In many transformers this is overlooked, with consequently overheating. Of course, I am not considering the case of extremely large transformers with outside methods of cooling. The ideal method of cooling a transformer without special water-cooling devices would be to have a coil outside the building if possible for each transformer; but that would be expensive, and at the present stage of transformer manufacture more or less unnecessary. One might be able to build larger oil-cooled transformers with outside cooling. Glancing at a well-known pocket-book of recent date, I found it was laid down that a 500 volt K.V.A. was the largest size one could go to in oil-cooled transformers. That, of course, is wrong. I know very many transformers of 1,000 K.V.A. running extremely satisfactorily, at all loads. With regard to the installation, one is much in the habit of putting a small transformer away anywhere and leaving it to itself. The building in which it is situated should be placed where it will get the least sun. A window in a transformer house or chamber where sun can get in is an abomination. By leaving the door open on entering there will be plenty of light. Ventilation is highly important. Ventilators on the roof or at roof level are of course a necessity. Ventilation on the floor level is best arranged by a cross arrangement of ducts under the transformer, fed into the centre from the outside, so that the air can enter in the centre and go up all four sides. In the case of a transformer with wings it is preferable to lead it up between the wings, as experience has shown. In connection with the position of the transformer in the chamber, in the case of chambers where only one transformer is installed, this should be placed so that there is the greatest possible space around consistent with the price one can afford for the building. I think it is important to get free circulation of air. The position depends greatly on the arrangement of the leads. It is highly important that the high tension leads should be arranged at the back and the low tension in front—not that low tension is always less dangerous than high, but there is less denger to life, and it is far easier to arrange for access to one's thermometer pockets, and the low tension leads may be safely insulated if desired. Very few small transformers have any arrangement for finding the temperature, and after all the life of the transformer depends on temperature. Every transformer of any importance should be fitted with a thermometer pocket and a thermometer, and constant readings should be taken. One cannot tell by putting one's hands on it whether it is dangerously heated or not. The thermometer is the finest diagnoser of trouble one could possibly have. The cost is small—the thermometer 3s. and the pocket a few shillings here, and considerably less if arranged for in the manufacture. It is important to have the thermometer in the right place—where you get the hottest oil—which is simply a matter of study of the position of the transformer itself in the case and the probable circulation. Air-cooled transformers are out of date, but extremely useful in small sizes. They are handy and easily altered to any different ratio one may wish, and in this country there is no need to fear dampness. Oil troubles are dispensed with, and up to 10 kilowatts I do not see why they should not be used. In big sizes they are extremely expensive and awkward to handle. Transformers should always be arranged so that one could transport them with the oil in their case ready dried out. It can only be done up to sizes of 1,000 kilowatts. In arranging transformers in a chamber, arrangements should be made for lifting them out of the case—a joist above the transformer exactly central would do, so that tackle can be fixed to it and sufficient head-room allowed so that the transformer can be brought out and dropped on the planking above the case for ease in repair or examination. Reverting again to the oil question, I would like to mention an extraordinary example. A 10,000-volt transformer had been running for three years with 50 per cent. or 60 per cent. load. We had never been able to look at the inside, but it seemed satisfactory and was quite cool. During a lightning storm one of the leads burnt out inside, which necessitated pulling it out of its case. We then found the oil was practically solid. It was an extraordinary example of lack of circulation, but plenty of good insulating material in the transformer saved it. There is a habit of referring to transformers as so many kilowatts. A transformer does not know what a kilowatt is. It only recognises a K.V.A. It should be insisted on that the transformer capacity in K.V.A. should be given. The point I would like a good deal of discussion on is what heating do we get on the ordinary small transformer. In most cases a transformer gets installed; it is switched in; it provides the requisite voltage; and it is left to itself. I should very much like to hear from any members present their experience on the ordinary heating of a small transformer. The efficiency of transformers I am not touching on. I am opening this discussion in an informal way; I do not think what I have said really needs a reply after the discussion, because it is only intended as a starting point; but I shall be able later, I hope, to discuss any points that are brought into prominence.

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* Discussion before S.A.I. of E.E.

500,000-volt Testing Transformer.

The *Electrical World* describes a transformer which has been specially designed for high-tension testing work. It has only one high-tension terminal, the other end of the winding being earthed. The insulation of the low-tension winding, and that beween the high and low-tension coils, is accomplished by means of insulating cylinders. The high-tension winding is insulated from the core, not by interposing large masses of insulation, but by subdividing the high-tension winding and so connecting the coils that the coil with maximum potential to earth is located at the greatest distance from the yoke. The unearthed end of the winding is at the middle of the column of coils. The coils placed closer to the yokes are nearer the earthed end of the winding and their potential to earth is correspondingly less. The coils at the earthed end of the winding practically touch the yokes. The distance of any coil from the yoke increases with its voltage above earth, and the potential gradient from the unearthed terminal is therefore fixed and uniform. The windings of this transformer have developed a voltage of 600,000 without any sign of distress. The high-tension terminal is of the well-known condenser type, made of alternate layers of insulating material and tinfoil so proportioned in length and thickness that the potential gradient along the surface from line terminal to earth is approximately uniform. A large "hat" on the top of the terminal is provided to prevent corona effect, and is made of wood, coated with tinfoil. Its effect is to make the static field from the line terminal to earth uniform and to prevent concentration of he static field. Without the hat, corona was present at about 350 000 volts. With the hat there is no corona up to 570,000 volts.

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Engineering Notes and News.

RAND ENGINEERING PROGRESS.

Important Review of Outstanding Features by Mr. F. H. Davis.

At the annual meeting of the South African Institute of Engineers last Saturday night the President (Mr. F. H. Davis) delivered the following valedictory address:—As it is the custom in this institution for the President, upon vacating the chair, to make an address to the members, reviewing, to some extent, the work of the past session, and, possibly, making some suggestions in connection with the future work of the institution, I shall follow this precedent, and take this opportunity of making a few remarks. I will not detain you long to-night, as I realise I am talking to a body of engineers who have followed the advancement of engineering locally as keenly as it is possible to; in fact, the advance in engineering and science locally is, to a large extent, in your hands and the results of your everyday work. As indicating the great range of engineering ability vested in the membership of this institution, it is only necessary to review the many and able papers submitted during the past session. It will then be seen that we have had papers and discussions covering about the whole field of engineering endeavour centering about Johannesburg. The last year, from the point of view of an engineer in the Transvaal, has been a year of hard work in bringing to completion the plans laid out during the preceding year or two, rather than a year of designing new plants or engineering undertakings on a large scale. We can now say that the enormous undertaking of equipping the larger part of the machinery of the mines for electric driving has been accomplished, and the transition from the old order of things to the new has been successfully carried out in every way.

VANISHED DOUBTS.

We can all recall the many doubts that were entertained as to the smooth working of this great change; the trouble to be experienced in getting men who for years had driven steam-winders to undertake and have full confidence in the new electric-winders, and therefore to be able to handle these winders well and efficiently; the danger of comparatively high voltages underground, and the difficulty of electric distribution underground; the terrible things that would happen when the power failed unexpectedly, and the great difficulty of maintaining a continuous service from large central stations in a country with such a climate as we have here. Well, we have seen the drivers of the old steam-winders take to the electric-winders with perfect confidence and get results that they never could with the steam plants. I have talked with many of them, and I have yet to find one who does not consider that the change has been for the best all round. Voltages of 2,000 and even 6,000 have been put underground with more safety and less trouble than was experienced with the so-called limiting voltages of 200 and 500 of a few years ago; and the secondary distribution from these high tension underground stations has been so well installed that trouble of any kind is an exception rather than the rule. I have yet to hear of any serious accident to life or property through the failure of the power during the operating period. The supply of power is now very dependable, but when the full equipment of all the central stations now in operation and projecting is installed, there should be no serious trouble in maintaining an absolutely reliable service.

COMPRESSED AIR.

The distribution of compressed air on a large scale from big compressor stations has, to a great extent, kept pace with the electrical advancement. I recall the fact that Mr. A. M. Robeson, in his valedictory address as honorary president of the Transvaal Institute of Mechanical Engineers, in June, 1908, painted a picture of the change in the responsibilities of the resident engineer if the power schemes then being discussed became accomplished facts. As Mr. Robeson ably predicted, the resident engineer to-day is much more interested in the number of power units he must sign for at the end of each month than in any other one point in connection with his duties. He cares no longer for the amount of oil used in the old style hot bearing, as the old hot bearing will not now be tolerated, as it uses unnecessary power, for which he must pay. Then, again, if an air leak takes place in the mine, the engineer will not screw the governor of the compressor up in order to hold his pressure, but will take the very next cage underground and stop the leak, and, furthermore this leak will at once be indicated to the engineer by the air-meters in use, a description of which has been so ably put before the members of this institution.

IRON AND STEEL WORKS.

Mr. Vaughan, in his valedictory address last year, spoke of the regrettable fact that the agreement between the Government and the South African Steel Corporation had not become an accomplished fact. I think I have a better picture to show you this year. At Dunswart, on the East Rand, there is a very well-equipped and busy iron and steel works, actually turning out rounds, squares, flats and angles in iron or steel, as well as rails weighing up to 20lbs. per yard. They are also producing tube-mill pegs and concrete reinforcing bars. These works have a capacity greater than 20 tons of finished product per day, and, of course, are using as raw material only iron and steel scrap purchased locally. Just at this time, when our legislators are having headaches as well as heartaches at Capetown over a Government contract with another steel company, it is certainly refreshing to know that the works on the East Rand are quietly hard at it every day, and are delivering the goods.

GAS-ENGINES.

It has hardly been the fashion in Johannesburg of late to have much to say about gas-engines, but in the face of local prejudice against this type of prime mover, we find a plant of some considerable size operating successfully and using almost any sort of bituminous coal as fuel. It is an item of engineering interest that must not be overlooked. I refer to the 400-h.p. producer gas-plant at the Groenfontein Tin Mine. This plant has been in operation for about a year, and is giving the very best results, vindicating, to a great extent, the reputation of the gas-engine in this country. During the past year the electrical engineer all over South Africa has at last received recognition from the Government which for a long time has been his due. Under the new Government regulations for issuing

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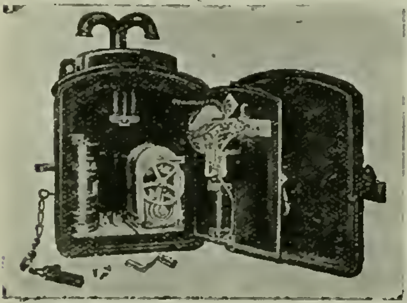

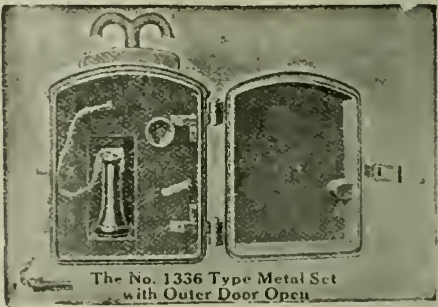

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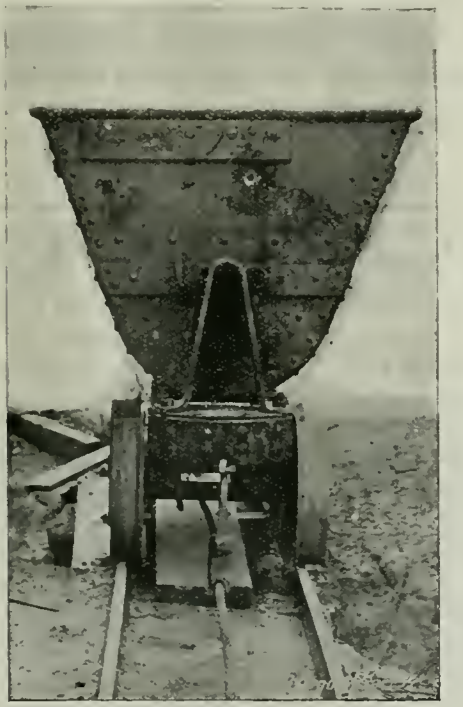
certificates to engineers, the electrical engineer has been given the opportunity of qualifying for and receiving full recognition, both as an engineer in charge of surface plant or central station, and for the locally more desirable certificate of engineer in charge of complete mining plant as resident engineer. This new arrangement of certificates has also stimulated our certificated resident mechanical engineers to qualify as electrical engineers, which in the conditions now applying on the Rand is most desirable, and I believe that, as the professions of mechanical and electrical engineering are so closely allied, especially on the Rand, it will not be a great while before most of the engineers in charge of mining plant will have both certificates framed on the walls of their mine offices.

THE FUTURE.

Looking into the future, I believe we all realise that this institution is now such a large factor in South African engineering circles that its continued and complete success is beyond doubt, and that we shall go forward always. There is, I believe, one great object which we should always keep in mind, and that is—through charter or some other adequate machinery—to be at the earliest possible moment in a position to offer our members the fullest protection and guarantee in their professional work and of their professional standing. That this object is almost Utopian, I realise, as it can only be accomplished by a very complete inclusion of all branches of engineering in South Africa, as well as a very large percentage of the engineers themselves, but the object is so desirable to all engineers that I feel it will ultimately be accomplished. I am sure that, if we strive towards this point it will be the means of bringing into our institution a great many engineers who are more than willing to help us to achieve this end. I wish now to record my sincere appreciation of the kind and thoughtful manner in which the members have helped me at all times during our meetings. It has been a pleasure to act as your president, and I shall look back on my experiences in the chair of this institution as the happiest experiences I have had on the Rand. In now vacating the chair in favour of your newly-elected president, Mr. J. A. Yule, it is with a full knowledge that he can count on the same uniform courtesy and consideration from members during his year of office as has been extended to me during mine. (Applause.)

Mechanical Haulage Underground.

This endless rope system has been in use several years in some of the largest iron and coal mines in England, and gives excellent results. With this system the rope is conveniently made by a patent device known as Rice's clip, as shown in photograph. The rope can be put in or taken out sideways after raising sliding piece as far as projecting pin. The clip is hung by its hook on to the truck, and the rope put in. The motion of the rope draws the clip a little away from vertical, and this slight deviation of the groove from the line of pull gives sufficient grip for haulage. The advantage of this system is the smooth and regular manner in which it works. There is no inconvenience if the drives are not straight, as it only requires small pulleys to keep rope in centre of track. The main portion of the clip is made of Farnley iron with a layer of double shear steel welded on each end of groove. The sliding piece is a malleable casting.



The report of the Select Committee of the Senate on the Land Survey Bill, Registration of Deeds Bill, and Townships Bill, with the drafts as amended by the Committee, has now been published. It will be seen from the report that some of the recommendations of the Chambers of Mines have been accepted. Certain of the Chamber's recommendations, however, which have not been accepted, will be again brought to the notice of the Government when the Bills are before the House in Committee.

The British Engineers' Association.

An important association has just been formed under the above title, with the object of establishing itself as a great national organisation for the promotion of the overseas interests of the British engineering industry as a whole—not to serve the interests of any one firm or clique, or to carry on trade in any way, but to overcome the obstacles by which British trade is hampered. The association was formed by 22 well-known British engineering firms, and even before incorporation (which took place on April 26th) it included some 60 members, most of them being firms of the highest standing, while others were awaiting election.

Safeguarding Ore Chutes.

Where winzes, ore chutes or ore passes open into a floor of a drift they are a constant source of danger to the miners and trammers who have to pass through the drift. In a large mine there are usually many such openings in the floors of the various drifts, and unless they are protected in some way, accidents, such as men falling into the openings, are sure to occur. It is an excellent plan to cut all such passes so that they will open to one side of the drift or into a niche cut into one wall. In such cases there need be no opening in the floor of the drift itself, but it is not always possible to offset the winzes in such a manner. Whether there is an opening in the floor of a drift through which miners pass, some provision should be made so that a man cannot fall into it. Preferably, the opening should be closed by a gate or else by a rough grizzly of logs or timbers. Where the run-of-mine ore is coarse, it may not be possible to use log grizzlies. In such a case some warning should be given the passer-by in order to make him aware of the fact that he is approaching the collar of a winze. At the Ray Consolidated mine in Arizona a device similar to that used on railroads to warn trainmen that they are approaching a bridge, is employed at all places where there are openings in the floor of a drift into which a man might fall. The device consists of a beam set in the roof of the drift about four feet from the edge of the opening: one beam is used on each side of the opening. From this beam a number of heavy cords, knotted at the end, hang low enough to strike the face and shoulders of anyone who passes below it. He is thus made aware of the fact that he is approaching a winze or chute and must be careful about passing that place.—"Engineering and Mining Journal."

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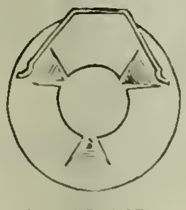

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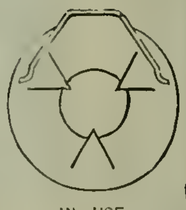

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Automobile Notes.

The Rand-Coast Road.

Now that the important work of surveying the route for the proposed Rand-coast road has actually commenced, this great project is of more than usual interest to the South African public. Motorists, in particular, view the undertaking with prospective delight, and recognise that it will be largely instrumental in still furthering the popularity to which motoring has attained in the sub-continent. In the past the holidaying motorists coast-bound, who consider the car invaluable from the point of view of sight-seeing, and who were obliged, with few exceptions, to rail their machines at considerable expense, to the port towns, will, on the completion of this grand trunk road system, be afforded the choice of motoring through parts of Southern Africa where the scenery is incomparable. Natal recognising the natural beauties of that colony, has long agitated for its opening up to tourist traffic, and will shortly see the consummation of the unremitting efforts put forth in this direction, while the benefits entailed are too obvious for comment.

Of late expert opinions on the systematic advertising of South Africa have afforded subject for serious reflection, and the great problem of how best to attract the tourist and settler to this part of the Empire, it would appear, is not so difficult of solution in the light of practical suggestions. So far as the motoring tourist is concerned the attractive nature of the Coast-Johannesburg road cannot be over-estimated. In the immediate post-war days, before the advent of the motor car, large numbers of tourists from oversea, many of whom had lost relatives and friends during the campaign, it will be remembered, visited South Africa, chiefly for the purpose of exploiting the various battlefields, the journeys from the nearest railway points being made in primitive style by the only transport available in those days—the mule and ox wagon. To-day the interest is still maintained, to a lesser degree, in the battlefields, which are reached in many instances by the automobile, despite the fact that the roads in their immediate vicinity are in the main undeveloped. On the completion of the trunk road, under discussion, it might be suggested that the work of road construction be extended, with a view to offering facilities to visit the scenes referred to, and were this made possible, tours, thoroughly organised, could be arranged, to include other points of interest, which might serve to bring into prominence, and afford an insight to, the great agricultural and other possibilities of the country, when the advertising of South Africa in the highest sense would have begun.

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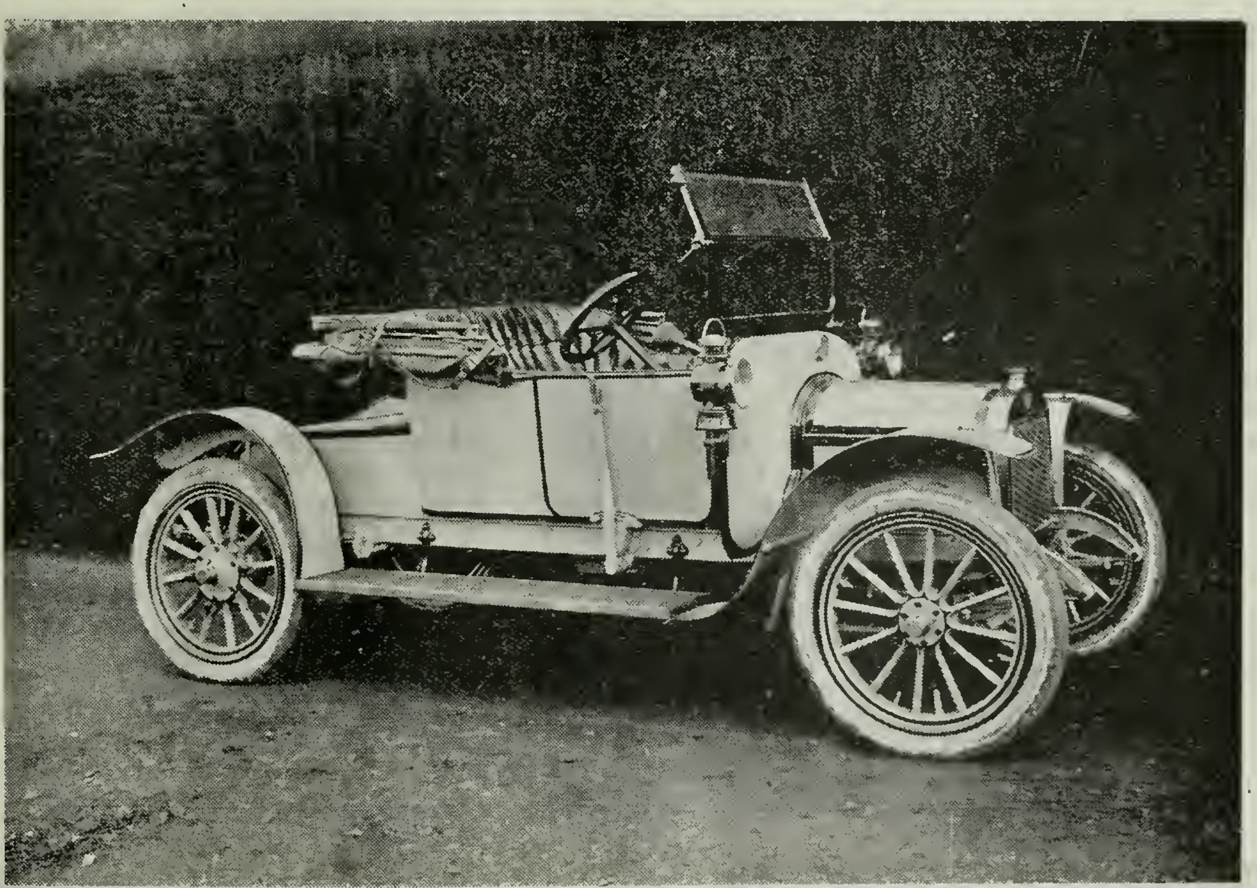

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Cars in the Colonies.

A CAR ON A BRITISH COLUMBIA MAIN ROAD.

The illustrations here reproduced are interesting, *apropos* the foregoing article, depicting scenic delights, in widely different parts of the Empire, secured by motorist photographers in the course of enjoyable travel, to which the automobile has so largely contributed. In almost every part of the world the motor has rendered like facilities to the tourist of artistic bent, and South Africa, one must conclude, recognising the effort being made to develop the road system of the country, will come into line in the near future and offer similar inducement, which, it may be said, has been so instrumental in attracting tourists and settlers in countries of older civilisation than ours.

A MAXWELL CAR IN TYPICAL CEYLON COUNTRY.

The Race for the Reyersbach Trophy.

Contrary to expectations, it is decided to hold the "Reyersbach" race on the Baragwanath course—the venue selected last month for the competitions for the T.A.C. and Motor Traders' Cups. This decision, it is understood, was

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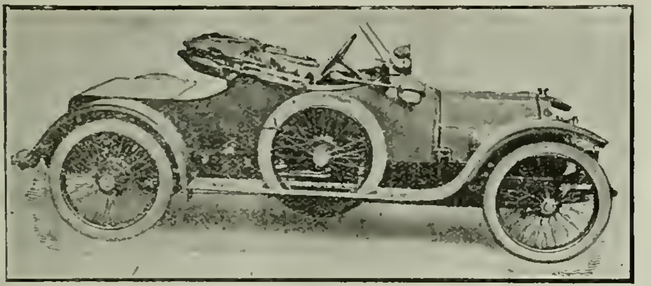
Cross Section

of Repair.

arrived at in deference to the wishes of several club members, who were of opinion that an element of risk attached to a speed contest being held on the Rustenburg road. The rules and regulations are practically unchanged, with the exception of minor details which the new selection will exact. The distance for the round trip is approximately 100 miles, comprising several laps of the course from Baragwanath to Van Wyk's Rust, via Jackson's Drift, back to the former place. The special competition for American cars exclusively, to be held in conjunction with the Reyersbach, is an innovation much appreciated in motoring circles, as will be apparent considering the great number of American cars on the Rand. The prizes in both events have already been described in these columns.



Our photo is the new pattern Riley 12-18 h.p. two-seater car, many of somewhat similar design being owned by South African motorists. It has a particularly handsome and roomy body. The engine is of the 90 degrees V type. The chassis is of good length with long flexible springs, and is fitted with "Riley" detachable wire wheels. Built with a view to meet colonial requirements, the clearance is exceptionally good for this run-about size.

Lubricating Oils.

The crorespondence which took place a little time ago in the technical motor journals, relative to the use of castor oil as a lubricating medium, had the effect of spreading, in a much more pronounced manner than by any other method of publicity, the manifold advantages of castor oil when used as one of the ingredients of a motor engine lubricant. Of itself, it is necessary to make clear, castor oil does not fulfil the role of a *perfect* oil for touring cars, inasmuch as it possesses certain decidedly objectionable properties—which can only be neutralised by treatment with other special oils having the virtue of rendering them innocuous. Such prepared oils, endowed with the richness of castor oil, but shorn of its defects, are now supplied in South Africa; in fact, the registered name, "Castrol," as applied to these lubricants, has become a household term.

Damage to Roads.

The purpose of the familiar signboard in Johannesburg, erected at many street corners, prohibiting the passage of tractors is a matter which concerns all motorists, who would wish such a provision extended to all streets in town proper, as no other vehicle is responsible for such extensive road wear. In addition, to motor cars, curiously enough, is attributed much of the wear that goes on. The bulk of the wear and tear, however, should be credited to the heavy tractor, as the passage of one vehicle of this description causes more disintegration of the road surface than a fleet of touring cars fitted with rubber tyres. Whilst admitting the "necessary evil," it appears that the damage effected might be lessened considerably were the wheels modified in regard to diameter and width. The weight of many tractors, it has been proved, is quite out of proportion to the width of the wheels. The ordinary cart of the heavy type, horse-drawn, when fitted with narrow tyres also contributes in a great measure towards the destruction of the roads, and if the question of registration fees were based on the destructive road powers of respective vehicles, as it should be, the motorist would escape very lightly in this respect.

Finance, Commerce, and Industries.

Leibig's Rhodesian Estates.

The *Bulawayo Chronicle* gathers that a shipment of pedigree bulls is about to be sent from England for the Leibig Company's Rhodesian estates, one of the company's local staff having left for the south to receive the animals on arrival, which is expected to be during the beginning of July. The animals include bulls of Aberdeen Angus and Sussex breeds, and also a few heifers of each kind, all having been carefully selected by the company's experts from among the best English herds. The present shipment, being the first, comprises a comparatively limited number, but no doubt the company, with its large holding of local stock to be improved, already approximating five thousand head, will considerably increase its importation of high-grade cattle once the best methods of acclimatisation have been ascertained.

* * * *

Cape Asbestos.

The report of the Cape Asbestos Company, Ltd., for 1911, to be presented at the meeting on 3rd proximo, states that the trade of the company during the year under review, notwithstanding the bad tendency still prevailing in the asbestos industry, has been satisfactory. In Italy, however, the difficulties mentioned in last year's report as to labour, etc., were further increased by the many inconveniences caused through the transfer of the plant and machinery into the new factory at Pozzo Strada, Turin. These unsettled conditions, which affected detrimentally the working results for the year, will not recur again. The new factory buildings, including the freehold land, cost £15,168. They give entire satisfaction, and will contribute to increase in future the earning power of the company.

Netherlands Bank of South Africa.

The report of the Netherlands Bank of South Africa states that the result of the bank's operations during the year to December 31st was satisfactory, as shown by the increase in the profits made both in South Africa and Europe, as compared with those for 1910. The result is a reflection of the steady progress in general which has been made in South Africa during recent years. Nevertheless, the progress of the country has been handicapped by the scarcity of native labour. The producing gold mines experienced very great difficulty in securing an adequate supply of labour for their requirements, and, therefore, notwithstanding the persistent efforts which have been made during recent years, the long-desired decrease in working costs did not materialise. Agriculture further suffered from the long drought. This specially affected the growth of mealies, the export of which consequently decreased from £704,876 in 1910, to £419,531 in 1911. It is not improbable that the consequences of this will be shown in the trade returns for the current year. The directors, therefore, think it prudent, notwithstanding the increase in the profit, to recommend the declaration of a dividend at the same rate as last year. After fully providing for bad and doubtful debts and setting aside a substantial amount for depreciation of bank premises and furniture, the net profits of the year, including the balance of £686 brought forward the amount to £16,689 (£200,275), which the directors recommend should be applied as follows: Dividend of 4 per cent. on subscribed capital, transfer to reserve fund (making it £24,000), £4,000 transfer to special (internal) reserve in South Africa £2,400, leaving to be carried forward £689.

S.A. Breweries. The report of the South African Breweries, Ltd., shows that a dividend of 17½ per cent. will be paid for the year, and that £20,000 will be carried to reserve and £37,394 carried forward.

* * * *

Liebigs in Rhodesia. Progress in the development of the ranch land in Southern Rhodesia is reported by the Liebig Company. A main camp and offices have been centrally established in the Tuli block, where the first stocks of cattle are at present concentrated. The work of survey is also being actively proceeded with. The company's interests in South-West Africa are also being further developed, and, although the land there suffered from drought last year, rains have since fallen and have been of much benefit to the pastures and cattle.

* * * *

Accident at Kynoch's. In a report issued this week, Major Denne, Chief Inspector of Explosives, states that the explosion at Kynoch's last year was caused by a decomposition in the separator, and that the decomposition was, in all probability, due to defective glycerine manufactured by Messrs. Kynoch, Ltd., at their glycerine works, the "Bluff," Durban. The publication of this report has been delayed, in order not to prejudice possible litigation, which the manager at Umbogintwini foreshadowed would ensue for damages, under circumstances which I will now briefly describe. Analysis of "Bluff" glycerine made from whale oil, subsequent to the accident of 1st March, 1911, showed the glycerine to be of variable quality, and accordingly its use was prohibited until an article could be produced which Doctors Moir and Nevill could pass as safe. As an analysis of the whale oil showed that there was no reason why a good glycerine should not result, it was suspected that the fault lay in the plant, and, with a view to determining this, Dr. Moir was to have proceeded to Durban, when the Department was advised that the plant had been dismantled and shipped home. The manager desiring an independent Home analysis of the whale oil glycerine, samples were, at his request, sealed and handed to him on 12th May, for transmission, it was understood, to Dr. Leukowitsch. Duplicate samples were sealed on behalf of the Department and arrangements made for their analysis in Great Britain. Report of analysis of the Department's duplicate samples states that such a glycerine "might be nitrated under precautions, observing that the separation of nitro-glycerine from the waste acids would possibly be slow, or characterised by a large quantity of flocculent intermediate layer, and that similar trouble might be experienced in the removal of the wash waters." A glycerine which on nitration gave the trouble described above, would not, according to Allen's Organic Chemistry, 1910, be considered suitable for the manufacture of nitro-glycerine, and the work in question appears to rely upon Leukowitsch for its standard of a "dynamite glycerine." It only remains to add that advice has now been received from the manager at Umbogintwini to the effect that the samples were never sent to Dr. Leukowitsch, "as tests at Birmingham confirmed ours here."

* * * *

Importation of Beeswax. It is notified that the prohibition on the introduction into the Transvaal of beeswax and foundation comb from oversea has been annulled, and that the introduction of the article into any part of the Union is now conditional on the issue by the Department of Agriculture of a permit with respect to each consignment. Any application for a permit should be addressed to the Chief Division of Entomology, Department of Agriculture, Pretoria. It should give the name and address of the party in whose name it is proposed to make the introduction, and the name and address of the shipper, and should specify the quantity and general description of the article, and name the port through which it would be imported. Any permit for foundation comb will be made conditional on the surrender to the Department of Agriculture of a sworn statement from the supplier declaring that the wax from which it was prepared was heated to a temperature of not less than 212 deg. F. for a period of not less than 2½ hours; and no ordinary beeswax will be admitted into the country unless it is treated on arrival in like manner and extent at the consignee's expense under the supervision of an officer of the Department or unless a sworn statement from the supplier showing that it was thus treated previous to its despatch is surrendered. No treatment or declaration will be required in respect of pure "white" beeswax, but any article consigned as such will be subject to inspection and to exclusion if it is not found true to name and to the terms of the permit for its introduction. Any wax containing dead bees or traces of honey will be excluded. The introduction of honey and second-hand bee appliances into any part of the Union from oversea remains absolutely prohibited, and the right to introduce any bees is reserved exclusively to the Government.

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Coming Maize Industry in South Africa.

The railways in South Africa will soon require grain elevators on a large scale for maize, which is destined to become the staple agricultural product of this country. This is the most important of all crops, wherever it can be grown. No other gives such an enormous yield of both grain and fodder, or can be grown more easily or cheaply. It is the maize industry more than anything else that has led to the growth of the meat-packing business in Chicago and Kansas City, which are in the heart of the maize belt. The United States grow maize over an area which is more than one-third of the Union of South Africa, and the crop, which is worth £350,000,000 on the farm, is used for a great number of industrial as well as feeding purposes. It is essentially a dry-land crop, and is therefore more suitable for South Africa than wheat. It is said that the most profitable method of disposing of the grain is to send it to market on four legs, that is, to turn it into a second product before selling, such as beef, pork, veal, butter, etc. It is highly digestible, easily masticated, and the fodder is one of the cheapest and most valuable of stock foods. Its many uses as a raw material of manufacture make it a great asset in other ways. In time, when the South African farmers have studied its cultivation better, vast districts will probably be devoted to it, and great cities, as in America, will live on its products.

* * * *

Rand Water Board Fire Insurance.

At the monthly meeting of the Rand Water Board, held yesterday, the report of the Finance and General Purposes Committee stated that the existing insurance policies, seven in number, covering the Board's properties against loss by fire, terminate on the 30th inst. The amount insured is £63,500, divided amongst the following companies: General Accident Fire and Life Assurance Corporation, Ltd., £10,000; Alliance Assurance Co., Ltd., £9,500; Northern Assurance Co., Ltd., £8,800; Norwich Union Fire Assurance Society, Ltd., £8,800; Union Assurance Society, Ltd., £8,800; London Assurance Corporation, £8,800; Liverpool, London and Globe Insurance Co., £8,800; total, £63,500. In the course of the current year, however, additional buildings have been erected and plant installed at Zuurbekom and Springs, the value of which, added to the amount now insured, brings the total to £79,025, as per schedule laid on the table. The premium paid at present is 3s. per cent. on the value of the properties, and the companies mentioned above, together with the Sun Fire Office, the London and Lancashire and the Western Assurance Companies, have offered to undertake the increased risk at the same rate for the coming year. The Committee consider that the additional amount of £15,525, included in the schedule of properties for the year 1912-13, should be divided equally among the three companies last named, the amounts to be allotted to the other companies to remain as at present. The rate quoted is considered very reasonable, being less than one-third that paid prior to the year 1909, when the General Accident Company commenced business on the Rand, and nearly 100 per cent. less than the premium paid for the period from July, 1909, to June, 1911. Accordingly the Committee recommended that the Board's property be insured against the risk of fire for the coming year with the companies and at the rate mentioned above.

* * * *

Rebates and the Small Man.

At Durban this week, Sir Owen Philipps complimented the commercial men of Pretoria and Durban over the unanimity of their desire for regular shipments, stability of freights, equality of treatment of the small man and the big, and all this freed of the incubus of rebates, and expressed his hearty desire that they might achieve all these blessings, free of this incubus. Sir Owen Philipps further announced that he had, in fact, come out here to South Africa to inquire how this most desirable state of things might be brought about, and that he would be both gratified and grateful if the combined wisdom of South African commerce would supply him with a solution to this problem before his return to England. Frankly speaking, he had not entirely arrived at such a solution himself, so far. Abolition of rebates, he took it, had been settled by the Post Office Act, and it was, therefore, on a non-rebate basis that the solution had to be sought. The position, he hinted, was all the more interesting, in that the rebate system had undoubtedly solved the problem of the three requirements aforesaid, and had been the only solution that the combined wisdom of the shipping combinations, on their part, had been able to discover. He had, he said, heard a partial solution at Capetown, and that was that an Act of Parliament should provide against the big man being allowed to pay lesser freights than the small. He, himself, would suggest that this proposal was too humorous to be taken seriously; "it might be a solution, but it was the only one he had heard as yet."

Discoverer's Rights.

Application has been made by the undermentioned to be regarded as a discoverer of gold in the mining district of Pilgrims Rest: Christine Campbell (major spinster), c/o J. G. Rawstorne, P.O. Vaalhoek, Pilgrims Rest; locality, Bodashoop No. 1154; farm owner, Witwatersrand Land and Exploration Company, Ltd.

Transvaal (North) G.M. Co.

The first annual general meeting the Transvaal (North) Gold Mining Company, Limited, was held in mail week, at Blomfield House, 85, London Wall, E.C. Lord Teynham presided, and the report was adopted. The report has not been published, and no work appears to have been done on the property.

Johannesburg Consolidated.

The board of directors of the Johannesburg Consolidated Investment Company, at their meeting this week, declared a dividend at the rate of 5 per cent., payable to all shareholders registered on the 30th June, 1912. The transfer books of the company will be closed from the 1st to the 10th July next.

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DIVIDEND No. 11.

NOTICE IS HEREBY GIVEN that a DIVIDEND of 5 per cent. (1s. per share) has been declared by the Board of Directors, for the half-year ending 30th June, 1912, payable to all Shareholders registered as at 30th June, 1912.

The Share Transfer Books will be closed from the 1st day of July, 1912, to the 7th day of July, 1912, both days inclusive.

The Dividend Warrants will be posted to Shareholders from the Head Transfer Office on or about the 22nd day of July, 1912.

By Order of the Board,
W. RUSSELL SLACK,
Secretary.

Head Office: Johannesburg,
The Corner House,
21st June, 1912.

Ginsberg Gold Mining Co., Ltd.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

INTERIM DIVIDEND (No. 18.)

NOTICE is hereby given that an INTERIM DIVIDEND OF FIFTEEN PER CENTUM (Three Shillings per share) has been declared payable to Shareholders registered at the 29th June, 1912, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 8th July, 1912, both days inclusive.

By order of the Board,

JOHANNESBURG CONSOLIDATED INVESTMENT
COMPANY, LIMITED, Secretaries.
Per FRANK HALL.

Head Office: Consolidated Building,
Johannesburg, 17th June, 1912. 35893

New Primrose Gold Mining Co., Ltd.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

INTERIM DIVIDEND (No. 38.)

NOTICE is hereby given that an INTERIM DIVIDEND OF TWENTY-FIVE PER CENTUM (Five Shillings per share) has been declared payable to shareholders registered at 29th June, 1912, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 8th July, 1912, both days inclusive.

By order of the Board.

JOHANNESBURG CONSOLIDATED INVESTMENT
COMPANY, LIMITED, Secretaries.
Per FRANK HALL.

Head Office: Consolidated Building,
Johannesburg, 17th June, 1912. 35894

New Unified Main Reef G.M. Co., Ltd.

(Incorporated in the Transvaal).

NOTICE TO SHAREHOLDERS.

INTERIM DIVIDEND (No. 8).

NOTICE is hereby given that an INTERIM DIVIDEND OF TEN PER CENTUM (Two Shillings per share) has been declared payable to Shareholders registered at the 29th June, 1912, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 8th July, 1912, both days inclusive.

By order of the Board,

JOHANNESBURG CONSOLIDATED INVESTMENT
COMPANY, LIMITED, Secretaries.
Per FRANK HALL.

Head Office: Consolidated Building, 35895
Johannesburg, 17th June, 1912.

Witwatersrand Gold Mining Co., Ltd.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

INTERIM DIVIDEND (No. 16.)

NOTICE is hereby given that an INTERIM DIVIDEND OF SEVENTEEN AND ONE-HALF PER CENTUM (Three Shillings and Sixpence per share) has been declared payable to Shareholders registered at the 29th June, 1912, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 8th July, 1912, both days inclusive.

By Order of the Board,

JOHANNESBURG CONSOLIDATED INVESTMENT
COMPANY, LIMITED, Secretaries.
Per FRANK HALL.

Head Office: Consolidated Building,
Johannesburg, 17th June, 1912. 35896

Geldenhuis Deep, Limited.

(Incorporated in the Transvaal.)

DECLARATION OF DIVIDEND No. 25.

NOTICE is hereby given that an Interim Dividend of Ten per cent. (Two Shillings per share) has been declared by the Board for the half-year ending 30th June, 1912.

This Dividend will be payable to all Shareholders registered in the Books of the Company at the close of business on 29th June, 1912, and to holders of Coupon No. 25 attached to Share Warrants to Bearer.

The Transfer Books of the Company will be closed from the 1st July, 1912, to the 7th July, 1912, both days inclusive.

The Dividend will be payable to South African Registered Shareholders from the Head Office, Johannesburg, and to European Shareholders from the London Office, 1, London Wall Buildings, London Wall, E.C., on or about the 6th August, 1912.

Holders of Share Warrants to Bearer are informed that they will receive payment of the dividend on presentation of Coupon No. 25, at the London Office of the Company, or at the Compagnie Française de Banque et de Mines, 20, Rue Taitbout, Paris.

Coupons must be left four clear days for examination, and will be payable at any time on or after the 6th August, 1912.

By Order of the Board,

RAND MINES, LTD. (Secretaries).
Head Office, S. C. STEIL, Joint Secretary.
The Corner House,
Johannesburg, 18th June, 1912. 35899

Rose Deep, Limited.

(Incorporated in the Transvaal.)

DECLARATION OF DIVIDEND No. 22.

NOTICE is hereby given that an Interim Dividend of 22½ per cent. (Four shillings and Sixpence per Share) has been declared by the Board for the half-year ending 30th JUNE, 1912.

This Dividend will be payable to all Shareholders registered in the Books of the Company at the close of business on 29th JUNE, 1912, and to holders of Coupon No. 22 attached to Share Warrants to Bearer.

The Transfer Books of the Company will be closed from the 1st July, 1912, to the 7th July, 1912, both days inclusive.

The Dividend will be payable to South African Registered Shareholders from the Head Office, Johannesburg, and to European Shareholders from the London Office, 1, London Wall Buildings, London Wall, E.C., on or about the 6th August, 1912.

Holders of Share Warrants to Bearer are informed that they will receive payment of the dividend on presentation of Coupon No. 22 at the London Office of the Company, or at the Compagnie Française de Banque et de Mines, 20, Rue Taitbout, Paris.

Coupons must be left four clear days for examination, and will be payable at any time on or after the 6th August, 1912.

By Order of the Board,

RAND MINES, LTD. (Secretaries).
Head Office, S. C. STEIL, Joint Secretary.
The Corner House,
Johannesburg, 18th June, 1912. 35900

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Notes and News.

Coal Rate Reductions.

The reduction in the coal rates to stations in the Union, detailed elsewhere in this issue, has been well received on the Rand. The reduction of 1s. made on coal for export is, however, regarded as disappointing. It is pointed out that the reduction is insufficient to enable the Transvaal and Natal product to compete in foreign and eastern markets; and that the coal export trade is therefore no better off than before.

* * * *

Mr. Ross E. Browne's Views.

In an interesting letter received by us this week from Mr. Ross E. Browne—famous for his report on Rand Costs—that distinguished engineer writes:—"I shall look forward to the receipt of your anniversary number with much interest—in fact, I always look forward with pleasure to the receipt of your journal from week to week. You manage to make it particularly interesting to the engineer. I notice that the total gold production of the Rand to date—during 27 years—is now greater than the total of California (about £300,000,000) during 63 years. This is a remarkable showing for so small an area as that of the Rand. There has been nothing to compare with it in the world's history of gold-mining. I am sorry to see your working costs going up again, and hope it is not due to relaxation of effort."

* * * *

The Robinson Deep Year.

The results for the last Robinson Deep year were, as Mr. Chaplin very modestly remarked at the meeting the other day, on the whole, satisfactory. The profit was increased by £84,885, the reduction plant capacity, and, we may add, its efficiency, have been increased, the ore reserves question is sound, and the labour difficulty has been obviated by a judicious employment of machine drills. It is proposed to acquire additional ground adjoining the southern boundary of the company, the inclusion of which would considerably prolong the life of the mine. The chairman's speech will be found in another part of this issue, and is well worth reading by all who are interested in Rand mining.

* * * *

Central (Derdepoort) Diamonds.

A quite recent and much-talked-of discovery is that of yellow ground at Derdepoort, about seven or eight miles north-east of Pretoria, where a road leads through the Magaliesberg quartzite to Kameeldrift and Roodeplaat. Some years ago a good deal of prospecting, or rather prospecting which was said to have cost a great deal of money, was carried on in the vicinity of the "poort" without success. We are not aware of the exact spot upon which the latest discovery has been made, but real yellow Kimberlite is said to have been located, and appearances generally are reported to be altogether promising. No work of importance has yet been done upon the ground, but preparations are being made to commence without delay. Volcanic breccia exists in the neighbourhood of the "poort," and it was probably this occurrence that stimulated the previous activity referred to.

* * * *

Rhodesian Prospects.

Sir Abe Bailey is said to have a good many legal actions on his hands, in addition to that of Mr. A. J. Sharwood, which, of course, he won. In other respects the position of the Rhodesian Mines is steadily improving, especially in connection with native labour, and it is believed that Mr. Piper, the consulting engineer to the Goldfields Rhodesian Development Company, who arrived in London from South Africa recently, brought with him favourable accounts of developments on this company's subsidiary mines. From London we learn that the improvement in the Rhodesian market, which has been noticeable during the last few days, is understood to be due partly to re-adjustment of the dispute between Sir Abe Bailey and the Goldfields Company. In connection with the special settlement in Goldfields Rhodesian Development Company, it is understood that there is a considerable " Bear " account in existence so that some curious developments might follow. The rise in Rhodesia, Limited, is based on a rumour of a favourable development on the Farvic Claims. The advance has, however, been almost general, with the chief exception of Tanganyika Concessions, which, according to the statements made at the meeting, are likely to continue in a hard-up financial condition.

* * * *

Mashonaland Agency.

The Mashonaland Agency issues a report for 1911, which will be read by shareholders with gratification. In spite of the depreciation prevailing in the Rhodesian market, the company's holdings of quoted shares and Debentures showed a market value at the end of the year in excess of the figures at which they stood in the books. This is mainly due to the appreciation of £96,800 in the Kimberley Mashonaland Gold and Wankie Colliery shares. The issued capital of the company is £398,976, while the assets are estimated to be worth £482,037. There is, therefore, room for appreciation in the shares even if we eliminate the mining claims, agricultural lands, farms, stands and buildings, which stand in the books at £97,000. The company is interested, in addition to the Kimberley and Wankie Colliery holdings, in the New Rhodesia District Development, Rhodesian Copper, Bwana M'Kubwa Copper, Rhodesian Broken Hill Development, and Chrome Mines Companies, all of which promise to turn out well. The actual profit made by the Mashonaland Agency was £17.385, and with the balance brought forward the directors have available £23 214 15s. No reference is made to a dividend, but we should imagine that the directors will declare an interim dividend of at least 2½ per cent. at the meeting.

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Taxation of Mining.

At the New Jagersfontein, Ltd., meeting last week Sir David Harris deplored the Government's attitude towards mining enterprise. Mining to-day, he said, is highly technical, risky and dangerous from both a physical and financial point of view, requiring a combination of highly qualified and trained engineers, business men, financiers, skilled miners and mechanics, all thoroughly organised for the safe and efficient working of diamond mines. It is also necessary to expend enormous sums in developing a mine, and the necessary machinery to prepare for an output. If the enterprise is successful then there are continuous worries, anxieties, disappointments, stoppages and difficulties to overcome, of which the public know little; but when we add to these the continual threats of fresh taxation, in addition to the enormous sum being paid to-day to the State, it will be seen that mining in South Africa cannot be attractive from either a speculative or investment point of view. During the present session of the Union Parliament the combined skill of Ministers and heads of certain departments was exercised in endeavouring to discover means by which additional taxation can be imposed upon holders of South African mining shares. This attitude, I need hardly say, created the impression in the minds of European shareholders, that the Union Government was hostile towards the introduction into the Union of capital from outside, the effect of which cannot but be injurious to this country, which requires to borrow large sums to develop its natural resources, apart from the money that will be required for new discoveries. We must attract and encourage the influx of foreign capital—any uncertainty or uneasiness as to the treatment by Parliament of foreign capital will divert it to other fields of employment, to the detriment of South Africa. While mining should pay—and is paying—its fair share of taxation, probably more, it is most unwise to devise measures for additional imposts.

Diamonds.

According to statements in the organ of the Dutch Diamond Cutters' Union, the conditions of some of the German diamond mines are steadily getting worse. The new directorate of the Weiss, de Meillon and Co., one of the most important companies, has recently estimated that the proceeds of the diamonds found is not sufficient to cover the cost of production. The loss made amounted to about f. 3·35 (5s. 7d.) per carat. The diamond fields of the company, which originally appeared in the company's books at 1,140,000 marks, have been brought down in the balance sheet at 200,000 marks only. Moreover, it appears that one-half of the capital of the company has been lost. On the whole, things in German South-West Africa appear anything but flourishing. Much is, however, expected from the new tax, by which duties will be levied on the net proceeds instead of on the gross value as hitherto. The main question, however, is that the exploration of the field continually requires greater expenditure, that the proceeds are getting smaller, and that the value of diamonds found is decreasing. The Diamond Regie, as appears from the annual report of this company for 1911-12, sold during that year 816,396 carats (previous year 798,865 carats) at an average value of 25·60 m. (previous year 26·77 m.), so that the total revenues on this head amounted to 20,808,600 m. (previous year 21,389,456 m.). The decrease in the average price is attributed to the decrease in the size of the stones and to the unfavourable proportion of the stones of higher value to those of lesser value. The net profit of the Regie amounts to 837.123 m., as against 687,961 m. last year; from this 42,856 m. is transferred to the reserve fund, as against 34,398 m. in the previous year. With reference to a report in the London papers as to new diamond discoveries at Inverell, New South Wales, the same paper says: " This is again one of the very many diamond canards, and one of the equally numerous efforts for the exploitation of valueless mining propositions. Inverell diamonds have been known for years as belonging to the worst and most uncuttable kinds of all the unworkable Australian classes of diamonds. We would like to know who is the Dutch expert, mentioned in the report, who contradicts our assertion. Every workman knows but too well how difficult it is to cut Australian diamonds, and, moreover, how poor the results are that can be obtained. If on this basis an Australian diamond industry is to be founded, we need not fear that the result will be detrimental to our interests in any way."

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Village Main Reef.

The report of the Village Main Reef Gold Mining Company, Limited, for 1911 states that the whole of the debentures outstanding at the date of the last report were redeemed on July 1 last. The realised net profit on the year's operations amounted to £404,196. Adding to this the sum brought forward from the preceding year—namely, £190,667—the balance at credit of appropriation account is £594,863. On June 14 and December 13 dividends Nos. 21 and 22, of 7s. each respectively, were declared, free of income-tax. These dividends absorbed £330,400, leaving £264,463 to be carried forward. The directors recommend an interim dividend of 7s. per share, free of income-tax. During the greater part of the year under review the native labour supply has been unsatisfactory. The latest advices, however, report a gradual improvement in this direction. During the year the company has increased its holding in the Village Deep by 20,000 shares, bringing the company's total holding up to 70,000 shares. The ore reserves at December 31. 1911, are estimated by the manager to be as follows:—Main Reef Leader, 653,208 tons, value 10·42 dwts.; South Reef, 584.868 tons, value 7·55 dwts.; Main Reef, 86,207 tons, value 4·41 dwts.; old workings in upper levels, 94,471 tons, value 10 dwts.; total payable reserves, 1,418,754 tons, value 8·85 dwts. The ore reserves show a good grade, and, provided there is an adequate supply of native labour, large profits can be looked forward to with every confidence for the current year.

Northern Transvaal Lands Co.

The Northern Transvaal Lands Company is a reconstruction made in 1901 of a company with a similar name formed in 1889. For 1901-2, ten per cent. was distributed, since when the shareholders have been without a dividend. The nominal capital is £50,000 in 200,000 shares of 5s. each. The property originally comprised sixty-three freehold farms of a total area of 308,021 acres. The report for 1911, to be presented to the meeting on the 29th instant, states that the profit for the year amounts to £91. Since the close of the company's financial year, there has been successfully formed and floated the Northern Minerals (Transvaal), Ltd., the subsidiary company which has been for some time past in contemplation by the board, but which, owing to litigation initiated by a prospector and since disposed of, has been delayed a longer period than had been anticipated. The properties purchased by the new company from this company are the farms called "Commissie Rust," "Voorburg," "Kranskloof," "Vaalpenskraal," and "Zondagsfontein." As a result of a discovery of tin on an adjoining farm, prospecting rights have been applied for and granted in respect of the company's property Grasvalley.

* * * *

World's Copper Output in 1911.

The twentieth issue of the Aron Hirsch Copper Statistics, just to hand, for 1911 shows that the almost unbroken increase in the world's output of copper—it receded, indeed, from 741,654 metric tons of 2,240 lbs. in 1906 to 702,044 tons in 1907—was continued during the past year, the production having advanced from 857,150 tons in 1910 to 869,370 tons in 1911, the increase being one of 12,220 tons, or 1·4256 per cent. Most of the producing countries shared in the increase, but Peru, Italy, Cape Colony, Bolivia and Newfoundland remained stationary. The 1911 output of the different countries in order of magnitude is as follows: United States, 487,300 tons; Japan, 55,000 tons; Spain and Portugal, together, 55,000 tons; Mexico, 54,050 tons; Australia, 44,600 tons; Germany, 30,500 tons; Chili, 29,600 tons; Peru, 26,000 tons; Russia, 25,500 tons; Sweden and Norway, 9,500 tons; Cape Colony, 7,000 tons; Italy, 3,000 tons; Austria and Hungary, 2,520 tons; Bolivia, 2,500 tons; Newfoundland, 2,100 tons; and Turkey, 700 tons. Total, 869,370 tons. It will thus be seen that the United States produce 56 per cent. of the world's total production, while the next largest percentage of the whole, 6·3 per cent., is that produced by Japan singly and Spain and Portugal taken together.

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Good News from Rhodesia.

Mr. C. F. Rowsell gave some interesting particulars at the annual meeting regarding the position and prospects of the various mining companies in which the Rhodesia Gold Mining and Investment Company holds interests. He pointed out that the developments in the Lonely Reef mine have exceeded the anticipations formed by the engineers who originally examined it, and that regular quarterly dividends of 10 per cent. may reasonably be expected as soon as the third tube mill, which is now being installed, is in operation. The Sabi Co.'s shares it is hoped to introduce on the market as soon as a favourable opportunity presents itself. At the end of last year the ore reserves were estimated at 55,465 tons of an average value of 9·6 dwts. per ton. The Cam and Motor outlook is most encouraging, and very satisfactory profits are confidently anticipated from this investment. "The fact that the company had in November, 1911, 736,000 tons of ore, of an estimated value of £1,730,000," Mr. Rowsell said, "is good evidence of the great value of the property." Apart from its shareholdings, the Rhodesia Gold Mining and Investment Co. owns, or is interested in, various properties which are now in course of development with a view to flotation at a later date. Of these, the Bernheim mine and the Felixburg claims appear to be shaping well.

TOPICS OF THE WEEK.

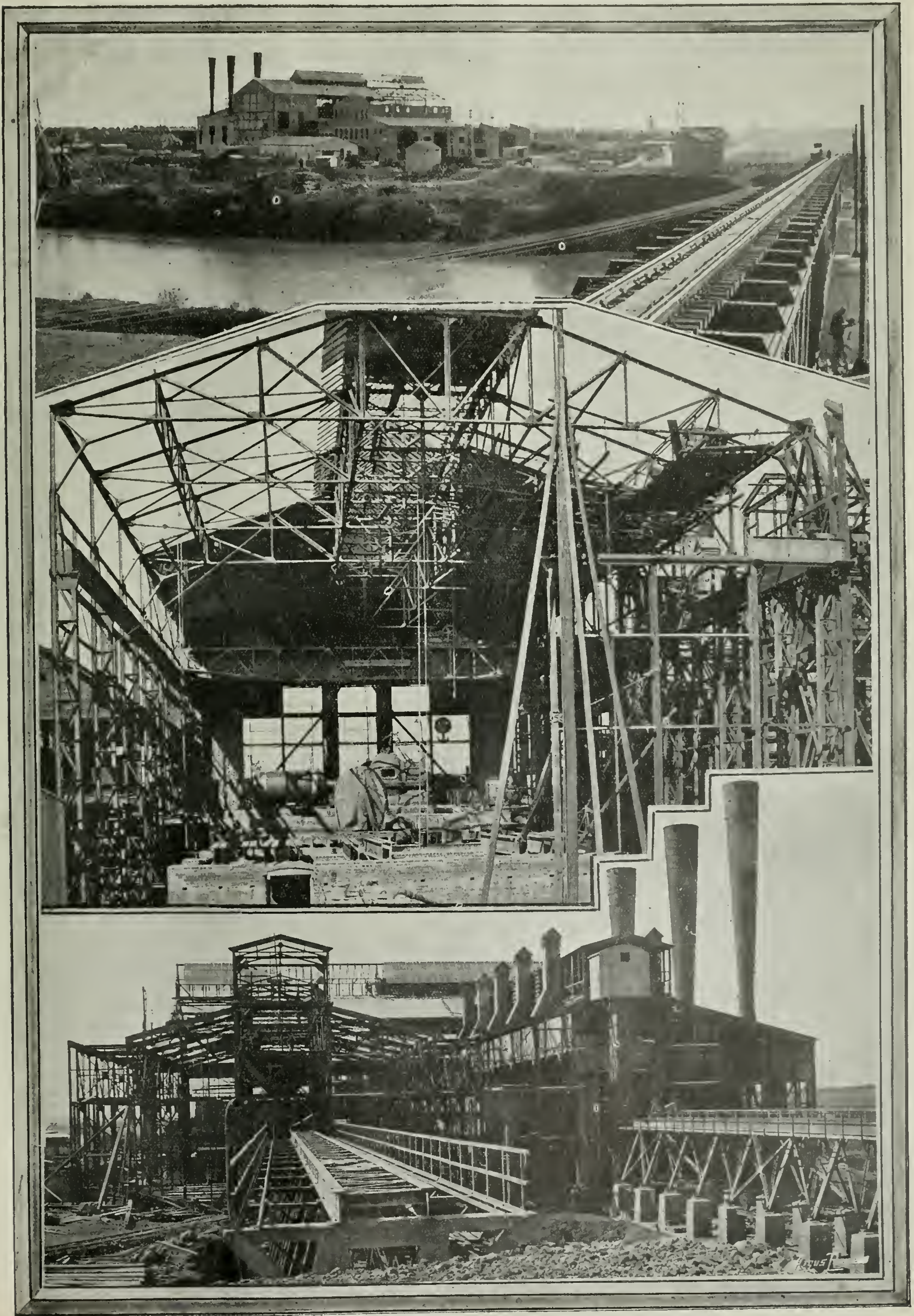
REFORMING LIVING CONDITIONS ON THE MINES.

There is a lamentable disposition in some quarters to pour cold water on Mr. R. W. Schumacher's efforts to improve the living conditions on the mines. Even a chairman of companies apparently is not able to escape the opposition and obstacles that invariably attend the first efforts of the reformer. Fortunately, however, Mr. Schumacher is able to bring to his support in the field of social reform, the same doggedness, perseverance and foresight that have won for him his high place in the realm of finance, and he is the last to be discouraged by the inertia of those he would benefit or the gibes of the critics. From the speech—instinct with the fine traditions of his firm—made at the Cornish banquet last Saturday night, we gather that not only is the City Deep housing scheme shaping towards success, but it is also growing out of all recognition. While the chemists and mine managers and engineers are being encouraged to redouble their efforts in the campaign against phthisis, Mr. Schumacher as the chairman of some of the leading companies, is anxious to supplement and emulate their efforts by improving the lot of the miner off duty. In the direction of enlisting the support of the Government, however, his efforts hitherto have failed. It will be remembered that in his evidence before the Select Committee on the Phthisis Bill at Capetown, Mr. Schumacher laid emphasis on the example set by the West Australian Commission, which made a definite recommendation that the Government should take into consideration a land settlement scheme in connection with the phthisis question, and recommended that the Lands Department should work as far as possible in conjunction with the Miners' Claim Board and with the Land Bank, and make a contribution on the lines adopted by the Tannin Settlement scheme. Mr. Schumacher urged the same thing for the consideration of the Select Committee as far as the Witwatersrand miners was concerned. He urged the Government to consider carefully some land settlement scheme, which would attract these men, when once they are touched with the disease, and thus enable them to obtain employment, and also advised the Government to consider favourably advances from the Land Bank to help them. He pointed out in this connection that it was estimated that 35 per cent. of the miners on the Witwatersrand were South African-born, and therefore more likely to be able and willing to return to the land. Of course that percentage was likely to increase largely, and to go much higher. Many of them came from the country and would therefore settle easily. His views, however, did not attract the Government, and on Saturday night Mr. Schumacher dwelt with regret on that fact. At any rate, the City Deep scheme is to take the more ambitious form of a larger township more to the south, named, doubtless, after Mr. Schumacher's old school, "The Hill." The intention is that, if it becomes successful, it should not be confined to workers on the City Deep alone. "The Hill" is very centrally situated, and the men on their bicycles can easily get from it to the Geldenhuis Deep on the East and to the Robinson on the west. Mr. Schumacher hopes that the township will in the next few years attract the best miners and the best mechanics on these fields. And if some of their mines in the central area are not able to give assistance directly to their men for financial reasons, he hopes, as chairman of the Rand Mines, Ltd., to be able to go to their assistance. The other directors of the Rand Mines, Ltd., are prepared to support the scheme. Mr. Schumacher made a forcible and eloquent appeal to the miners on these fields to begin to work now towards establishing their own homes. "Give up, if you can," he said, "your betting on horse races, and on whippet races. Give up your gambling on the Stock Exchange and think of the homes that it is your duty to found. I have two objects in view. The first is to stop this coming and going on the mines, which is bad for the men, bad for their families and bad for the companies, because it disorganises work. I want to concentrate a number of the picked miners, of the picked men, on these fields within easy reach of our own central mines. That is my justification for helping you, and no shareholder will object. My second object is this: I want to start in a small way what I hope will be a big movement that will spread throughout this country. I want to see whether with your co-operation we cannot arrange that nearly every worker has the opportunity of founding his own home in this country. If the directors of the City Deep or of the Rand Mines can make this a success, how much more can be done by the Government of the Union of South Africa and by the municipalities of the great towns all over this country? If we can make a success of it at the City Deep, I think it will be followed by others on a larger scale, and will materially improve the conditions of life among a large section of the people of this country. You will be able under better conditions of living to enjoy your own lives more. You will be able to rear a strong, healthy, virile race in the future, and will realise what that will mean amongst others to the men and women of Cornwall and the children of South Africa." We can only hope that these inspiring words will have the desired effect, that the coming of the new era of healthier conditions on the surface and underground will effectually counteract the recklessness and improvidence that sprung inevitably from the body- and soul-destroying environment of the mines.

NEW JAGERSFONTEIN AND THE DIAMOND OUTLOOK.

At the annual meeting of the New Jagersfontein Company last week, Sir David Harris delivered an important speech dealing with the progress of that mine and the outlook for diamonds. That working costs at New Jagersfontein would increase under the underground system now entered upon was frankly admitted, while at the same time the reasons were explained why it is fully expected that these costs will be somewhat less during the ensuing year. Fortunately, the heavy expenditure on development during the past seven years has been wholly provided for by setting aside a proportion of profits annually. The amount spent on hauling and washing at the mine during the year under review was £615,374 4s. 4d., against £373,324 5s. 4d. the year previously. A wise policy is being pursued in steadily increasing the quantity of blue on the floors, a course of procedure of which the full advantage will be reaped at a future date. The diamond output for the year realised £1,116,432 7s. 9d., an increase of £122,653 1s. 10d. on the year previously, a comparison which reflects alike on the continued high quality of the product, the wisdom of a regulated output, and the restoration of the market. The demand continues to be well maintained—this is obviously a point of general interest—"in fact, prices for good qualities have advanced considerably, which is evidenced by the increased price obtained by the company for its output, which amounted to 8s. 6d. more per carat than we secured for the diamonds produced during the financial year ended March 31st, 1911." The shareholders will welcome the reduction of railway rates, by which a just grievance has been remedied. Comparing the company's financial years ended March 31st, 1911, and at the end of March, 1912, the Chairman showed that last year they hauled 2,479,715 loads of blue ground and 349,199 loads of reef and stones—in all 2,828,914 loads. This year they hauled 3,479,648 loads of blue ground and 213,991 loads of reef and stones—grand total, 3,693,639 loads, 864,725 more loads than last year. Washing returns showed an increase of 362,548 loads. The total amount spent during the year for hauling and washing was £615,374 4s. 4d., compared with £373,324 5s. 4d. last year, an increase of £242,049 19s. The total cost per load for hauling and washing was 3s. 5·51d. against 2s. 7·30d. for last year, an increase of 10·21d. per load. This year the company produced 344,635¼ carats of diamonds, which realised £1,116,432 7s. 9d., while during the previous year the output amounted to 338,831¼ carats, sold for £993,779 6s. 9d., the average value per carat for the former being 64s. 9·47d., and the latter 56s. 3·63d., described by the Chairman as "a very gratifying rise, the result of feeling the world's market, and barely supplying the demand for the fine class of diamonds which the Jagersfontein mine yields." For the year ended March 31st last shareholders received 10s. in dividends, as against 12s. for the preceding twelve months, a reduction of 2s. per share, a most prudent course to adopt considering that the profit for this year was £464,349 19s., as against £532,150 11s. 2d. for the preceding twelve months, a decrease of £67,800 12s. 2d., brought about by an increase of 10d. per load for hauling and washing. The proceedings at last week's meeting show that the transition from open to underground working has been conducted with a judicious regard to the requirements of maintaining a sound and strong position alike from a mining and financial point of view. The Chairman, however, did not fail to point out there is no present promise, even with a reduction of working costs, of an increased dividend, as the policy of increasing the blue on the floors will necessarily absorb a portion of the cash profits. "It is our intention to place the company in a strong position from a mining point of view," said the Chairman, "and put it into an easy financial condition; when this is accomplished, providing that the demand for diamonds remains as at present, it will not be difficult to give a better and more adequate return to shareholders."

NEW VEREENIGING STATION: VICTORIA FALLS POWER CO., LTD.



(2) Turbine Room in Process of Construction. (3) End view showing

GOLD MINE DIVIDENDS FOR HALF-YEAR ENDED JUNE 30, 1912.

The Bantjes Enters the List—Improved Distribution by the Village Deep. Brakpan Mines Make a First Appearance.

	Date of Declaration.		No.	Per Cent.	Capital.	Amount.
ECKSTEIN-RAND MINES GROUP—						
Crown Mines (10s.)	June	18	22	55	940,106	517,058
Nourse Mines	January	17	15	10	827,821	82,782
Ferreira Deep	March	13	18	20	910,000	182,000
Village Main Reef	June	13	23	35	472,000	165,200
Village Deep	June	11	8	7½	1,060,671	79,550
New Modderfontein (£4)	June	11	12	12½	1,400,000	175,000
Bantjes Consolidated	June	11	1	5	502,306	25,115
Robinson (£5)	June	11	40	12½	2,750,000	343,750
Durban Roodepoort Deep	June	18	6	5	440,000	22,000
Rose Deep	June	18	22	22½	700,000	157,500
Geldenhuis Deep	June	18	25	10	585,753	58,575
Ferreira	June	4	—	50*	95,000	47,500
GOLD FIELDS GROUP—						
Simmer and Jack	June	19	20	7½	3,000,000	225,000
Robinson Deep	June	19	19	15	1,000,000	150,000
Knight Deep	June	19	14	12½	643,526	80,441
Jupiter	June	19	2	2½	1,014,200	25,355
BARNATO GROUP—						
Ginsberg	June	17	18	15	210,000	31,500
New Primrose	June	17	38	25	325,000	81,250
New Unified	June	17	8	10	250,000	25,000
Witwatersrand	June	17	16	17½	425,000	74,375
ALBU GROUP—						
Meyer and Charlton	June	13	45	25	200,000	50,000
Van Ryn	June	12	17	22½	500,000	112,500
FARRAR—ANGLO-FRENCH GROUP—						
East Rand Proprietary	June	14	14	12½	2,445,897	305,737
New Kleinfontein	June	17	16	7½	970,000	72,750
CONSOLIDATED MINES SELECTION—						
Brakpan Mines	June	15	1	15	750,000	112,500
NEUMANN GROUP—						
Wolhuter	April	12	9	8¾	860,000	75,250
New Heriot	May	9	36	40	115,000	46,000
Treasury (£4)	June	12	13	12½	540,000	67,500
Main Reef West	June	12	6	7½	491,188	36,839
Witwatersrand Deep	June	12	13	12½	550,000	68,750
Consolidated Main Reef	June	12	8	5	924,364	46,218
ROBINSON GROUP—						
Langlaagte Estate	June	27	44	5	869,500	43,475
GOERZ GROUP—						
May Consolidated	June	14	28	15	288,750	43,312
MISCELLANEOUS—						
City and Suburban (£4)	June	13	25	7½	1,360,000	102,000
Durban Roodepoort	March	1	76	10	125,000	12,500
OUTSIDE DISTRICTS—						
Sheba (5s.)			—	10	269,738	26,974
Worcester	June	22	45	10	95,722	9,572
Glynn's Lydenburg	January	11	21	10	170,000	17,000
Transvaal G.M. Estates	March	11	12	12½	604,225	75,528
Nigel	June	20	32	5	223,106	11,155
					Transvaal total	3,884,511

LATEST FROM THE TIN FIELDS.

The New Strike at Zaaiplaats—Water Supply Reassuring—Prospecting on Mozambique and Bellevue.

The discovery of what appears to be an entirely new pipe body on Roodepoort, within a distance of about one hundred and fifty feet from the Zaaiplaats boundary, once more emphasises the unusual richness of this unique tin mine. According to the communication from the mine manager regarding the discovery, although some ten feet by twenty-five feet were exposed in a blast, the peripheral limits of the pipe had not been exposed. A winze has been sunk upon the body, and, from indications which have appeared near the surface in this opening, there seems little doubt that the dimensions of the pipe are pretty considerable. The values, also, as has been stated, are good, and there is doubtless good reason for the belief that prevails in the neighbourhood that it is likely to turn out the largest and finest occurrence that has yet been struck upon the property. As it is making for the Zaaiplaats claims at a low angle of dip, it is probable that it will cross the boundary at no great depth from the surface. In the meantime the Transvaal Consolidated Lands are reaping a certain portion of the reward which accrues from the find. According to the terms of the agreement, two-thirds of the ore is to be delivered to this company, the remainder falling to Zaaiplaats, until the workings enter the boundary of the latter, when, of course, the whole output will be taken. The division is made in bulk in a simple way. The ore taken from the leased ground is divided as nearly as possible into three equal heaps, and at the end of each week the Transvaal Consolidated Lands make a choice of two of them and have the ore conveyed to their own mill. The whole expenditure incurred by Zaaiplaats, therefore, is that of mining and development—no great matter, presumably, in view of the large size of the ore-body and its nearness to the surface. It is interesting to observe that the outcrop of the new strike is on the face of a somewhat precipitous cliff, which those who have visited the property will probably remember as being one over which the Transvaal Consolidated Lands wire ropeway was constructed from near the No. 13 pipe to the ore-bin in the donga.

Zaaiplaats Water Supply.

The water for the supply of the milling and dressing plant at Zaaiplaats is brought through six-inch steel Mannesmann tube piping from the Sterk River, over a distance of four and a half miles and against a head of seven hundred and fifty feet. Pumps and suction gas plant are in duplicate at the river, so as to guard against any danger of a breakdown in what is a very important section of the mine plant. The defective rainy season of this year has been followed by a drying-up of streams to a large extent in the Waterberg district, but the scarcity of water has not yet made itself felt at Zaaiplaats. The Sterk River, from which the supply is obtained, has numerous pools which act as natural reservoirs and which have a considerable aggregate capacity. On enquiry, we learn that no great anxiety is felt with regard to the future in this matter, for the company's dam alone has sufficient water to keep them going for several months yet.

Prospecting Activity.

It is said that prospecting is about to commence on the Delagoa and adjacent properties lately taken over by the Nigerian and Waterberg Tin Fields Trust, Ltd., and that an engineer, Mr. T. J. Scoones, who has recently arrived from England for the purpose of examining the ground, was due on the property at the beginning of this week. Mr. Pat Boyle, who, we understand, is responsible for the selecting and pegging of the ground in question in the first instance, is reported to have taken up a great deal more ground in the neighbourhood, whether on his own account or on behalf of the new company is not stated.

A feature of the granite belt, which runs north-eastwards along the Magalaqueen, is the occurrence of diabase in sheets of considerable thickness, dipping conformably with the general trend of the granite. The map accompanying the well-known memoir of the Geological Survey Department shows a large mass of it extending through the northern part of Mooihoek into Mozambique, and thinning off to a narrow tongue at the eastern corner of Bellevue. A recent inspection of the country has shown us that the diabase occurrences on Bellevue are of much greater extent than are indicated by the survey. It is said that this rock carries tin to the extent of 0·25 per cent. by assay, and hopes are entertained that the actual presence of tin under these conditions indicates the presence of the metal in greater quantities in the enclosing red granite. Sufficient prospecting work has not been done to give any definite information on the point.

Operations are about to be continued on the claims of the Bellevue Tins, the flotation of which was referred to in this journal a few weeks ago. The ground in question lies on the western side of the Sterk River, near the Klipplaatdrift boundary, well in the red granite area, apparently. An east and west fissure is said to carry tin over a long distance.

National Diamonds.

Owing to a legal technicality the reconstruction scheme of this syndicate has been somewhat delayed. The matter is now being pushed forward, however, as quickly as possible, and another meeting of shareholders, for the purpose of completing final arrangements, is advertised for 8 p.m. on July the 16th at Consolidated Gold Fields Building. Meantime work is being pushed on energetically at the mine, and the machinery and plant have been added to and put in thorough working order. A few hundred loads of more or less surface ground and debris have been put through the pan with very satisfactory results, the diamonds won being generally of a greatly improved quality to anything previously found by the company on this property. Many thousands of loads of first class mine ground had been developed and were ready for treatment when regular washing operations began on Wednesday last, the water from the pan being supplied from the permanent dam at No. 2 mine. On the whole, the prospects of this venture are distinctly encouraging, and we understand that there is little likelihood of progress being delayed now that a clear start has been made. There are indications of an important extension on the south-west side of the No. 1 mine, from which, by the way, ground is now being sent to the machines.

Randfontein Central.

From the report for the quarter ended March 31:—Total working costs, £587,129; profit, £187,316; revenue, equal to 23s. 7·06d. per ton milled; expenditure, equal to 17s. 10·60d. per ton milled; profit, 5s. 8·46d. per ton milled. Mill: Crushed, 656,641 tons; yield, 99,526·267 ozs. Cyanide: Treated, 660,084 tons; yield, 83,566·361 ozs.; total yield, 183,092·628 ozs. Capital expenditure, £84,920. Development: Driven, risen, and sunk, 18,441 linear feet and 61,998 cubic feet. Total ore reserves at March 31, 6,531,157 tons.

A combine of the French Rand, Tudor, French Rand Deep and South French Rand is on the tapis.

ACCIDENTS ON RAND MINES.

Cause of Accidents—Are More Inspectors Required?—Equal Rate Amongst Whites and Natives.

REPLYING on Saturday night to a paper read before the Chemical and Metallurgical Society of South Africa on the subject of accidents in Transvaal mines, with special reference to falls of ground, Mr. J. Chilton, while admitting that the Transvaal mining inspectors are overworked, said that it must not be assumed that an increase in their number would lower the accident rate, unless it was intended to put one in every mine. An increase in the number of inspectors would remedy the dust evil in the mines, but would have little effect upon the accident rate. The contention that big mills did not affect the accident rate, as the rock handled per person in big mines was not greater than that handled per person in small mines, was not supported by statistics, for, after some search, the author had made out the following result for 1910: Mines with less than 1,000 employees had an average tonnage of 109 tons per employee per annum, while mines with more than 3,000 employees had 151 tons per employee over the same period. That increase of tonnage in the deep level mines partly accounted for the hustle that was associated with them. The assertion that an "air blast" was due entirely to roof pressure was not borne out by expert evidence. Mr. M. Rychap had said that there could be no doubt that air blasts were due to the sudden release of tension in the crust of the earth. The Rand miner, being practically a supervisor, could not complain of excessive wear of muscle or brain, but, as the shortening of hours would accelerate the pace, its tendency would be to increase the accident rate. Dr. J. L. Aymard had raised the question of how far illness contributes to the accident list. This was a question difficult to solve, but that it did contribute few persons would deny.

Mr. J. E. Vaughan, Inspector of Mines (continued the author), did not consider it fair to make comparisons between the Rand and England, because in the latter country the underground workers were miners. Mr. Vaughan had spoken of the difficulty of proving to a magistrate that certain systems of mining are dangerous and should be stopped. Surely the time had come when a mining magistrate should be appointed to try all serious charges under the Mining Regulations. Against the present magistracy the author had not one word to say, but no one could deny their inability to give satisfaction in mining cases. It was not enough to have a public prosecutor who understood mining; there should also be a magistrate. On questions of law the magistrate could be advised by the clerk of the court. On questions of fact and mining procedure, he ought to be so well versed that he could save both the time and the temper of mining litigants. Mr. Vaughan's penultimate paragraph compressed the whole of the author's paper into three lines when he said: "No one will contend that the natural dangers on the mines of the Witwatersrand are so great that they cannot be surmounted with care and skill." Such an expression of conviction from a cautious, experienced inspector of mines, such as Mr. Vaughan is, was not one of the least points of interest that the paper had brought forth.

NEED OF DISCIPLINE.

In reference to other criticism, the author, while admitting that safety measures were still not receiving that consideration which they demand, saw some evidence of the progress that was being made along various lines to secure the safety and health of the underground employees, and in that fight the Society had played no ignoble part. Having pointed to the progress they had made in the matter of miners' phthisis, he outlined various improvements that had been carried out, such as mine ventilation, sanitation and first-aid appliances. Discipline was becoming slacker year by year. The native worker had become so flattered by wily recruiting agents, and so pampered by indulgent compound managers, that the task of getting a fair day's work out of him was almost impossible. Unlike the white worker, he had no fear of dismissal or disgrace. In many mines if a native simply put in an appearance at his working place he must be given a wage-ticket. Orders given for his safety he disregarded light-heartedly, and if any miner backed up his commands by physical force he was fined by a magistrate. No person wished to encourage brutality underground, but between brutality and namby-pambyism there was a long stretch of neutral ground. Probably more corporal punishment was administered in an English public school in one week than occurred in a Rand mine in a year. What in the English schoolmaster was necessary discipline became callous brutality when performed by a Rand miner. Fines and imprisonment had little effect on the native mind. Lack of discipline underground undoubtedly caused accident, and unless the miner had power to compel obedience, this cause seemed likely to neutralise efforts put forth in other directions. The following table might correct a prevalent idea that the native accident rate far exceeded the European rate:—

DEATH-RATE PER 1,000 EMPLOYEES.

	Whites.	Coloured.	Chinese.
1905	4·01	5·32	6·82
1906	4·27	4·21	6·00
1907	3·41	3·92	5·76
1908	3·98	5·43	5·66
1909	3·49	4·40	3·76
1910	2·81	4·09	—

From the foregoing it would be seen that the "ignorant savage" was only slightly inferior to the civilised European in his ability to escape the dangers of mining life, and that the mining Moloch demanded an almost equal number of white and black victims. It also showed that the charge brought against white miners that they asked native assistants to perform duties which they themselves thought too hazardous was based upon scanty facts. Mr. W. Cullen and Dr. D. Macaulay had raised the question of the frequent changing of both managers and miners, and considered that the practice helped to swell the accident rate. The author was convinced that the curse of change with its sequel of accident would not be stayed until the industry dealt with the system of payment underground. In summing up the discussion, the author said: "It is apparent that there is no royal road to the prevention of accidents, for the river of accident is a stream having many tributaries." Probably the following conclusions will represent the verdict of the majority that have joined in the discussion: That the accident rate in the Transvaal mines is excessive; that nothing in our local conditions warrants this rate; that underground discipline needs strengthening; that further regulations are unnecessary; that deep levels are more dangerous than outcrops; that mine changes affect the accident rate; that "hustle" produces accidents; that safety and efficiency on the mines are not incompatible.

Langlaagte Estate.

From the report for the quarter ended March 31:—Total working costs, £142,117; profit, £35,806; revenue equal to 22s. 9·15d. per ton milled; expenditure, 18s. 2·18d. per ton milled; profit, 4s. 6·97d. per ton milled. Mill: Tons crushed, 156,330; yield, 17,181·245 ozs. Cyanide: Tons treated, 183,434; yield, 23,457·519 ozs.; total yield, 40,638·764 ozs. Expenditure on capital account, £9,559. Development: Driven, risen, and sunk, 3,633 linear feet, and 16,120 cubic feet. Total ore reserves at March 31, 1,249,115 tons.

Bubola Syndicate shares were last week dealt in at £14. The shares have been quiescent for some time, but tests of the process are now going on at the Nourse Mines under the supervision of the Mines Trials Committee.

RETREATMENT OF SAND RESIDUES.

The Stanley Classifier at the Bonanza Sands, Ltd., to Handle 600,000 Tons—Excellent Results from Experimental Trials.

The Bonanza Sands, Ltd., is a company which has been floated for the purpose of dealing with some 600,000 tons of residue sands from the Bonanza dumps which represent mainly material which was cyanided previous to the adoption of residue sands from the Bonanza dump which represent from the latter property, after the Robinson Central Deep began to mill with the Bonanza battery, were discharged partly on the dump in question, and if necessary could be left or removed without much inconvenience. The company has been formed to treat the sands by a hydraulic concentration process, the apparatus used being that devised by Professor Stanley, of the Transvaal University College, and referred to in a report of Mr. William Laurie Hamilton, which was published in this journal several months ago in connection with some experiments which were in progress at the Robinson.

The concentrator having proved its capability of dealing with dump sands efficiently and upon a large scale, steps were taken to commence practical operations. The original company, floated privately to control the patent, is known as Sands, Ltd., and the Bonanza Sands, Ltd., is a subsidiary for the purposes above-mentioned. Not only has the Bonanza dump been acquired by the company, but the right also to use the mill buildings and cyaniding plant. By this means a certain amount of capital expenditure has been saved, and an appreciable amount of time as well, no doubt. Three of Professor Stanley's patent classifiers, constructed by the United Engineering Company, Ltd., are being installed in the old battery house, into the bins of which the sands are being discharged as they come from the dump. An adequate storage capacity has thus been provided, which should obviate any difficulty that may occur in the shape of delay or breakdown in the transporting service.

Quite adjacent to the mill is a sands filling site, and the intention is to deliver the treated sands directly to the shaft at this point whenever filling operations are being carried on. This facility will tend still further to cheapen the cost of operating the plant, and when the excellent values which are found in the Bonanza dump are taken into consideration, it will be agreed that altogether the company are commencing work under distinctly favourable conditions.

An Old Experiment.

It is interesting, at the outset, to revive the memory of a gold recovery process which was tried some fifteen years ago on the same sands. The apparatus used was a travelling belt made of cocoa-nut fibre matting, and the process consisted in taking the sands immediately from the vats and passing them in a thin layer over the belt. At the head of the belt a spray was brought into action, and the effect of the fairly thorough washing given to the sand was to displace the soluble gold remaining in the still moist sands. The results were said to have been satisfactory, but owing to the fact that the trials were not sufficiently prolonged to allow of definite statistics being collected the experiment did not arouse much enthusiasm and the undertaking fell through from want of funds. The apparatus, as far as we know, however, was the first of the travelling filter ideas which have been modified and improved with some success in recent years.

Points on Classification.

To return to Professor Stanley's classifier, it may be explained that the machine combines the advantages of hydraulic classification and screen sizing. As the inventor himself remarks: "For dividing or grading crushed material into two or more sizes, screens of various mesh theoretically give the most perfect results, but while they can be used for comparatively coarse sizes, for fine material their action is so slow and costly as to preclude their use in most cases. Instead of screens for the fine material, hydraulic classifiers of various forms are used; these have a satisfactory output, but the products are more or less imperfect, a large proportion of fine remaining mixed with coarse, or *vice versa*. If a satisfactory product is obtained, it can only be done by allowing a considerable proportion of coarse to escape with the fine. It is in order to prevent this escape of coarse material that the present classifier was devised, and it consists broadly in the attachment of a reciprocating screen of the required mesh to the fine overflow of a hydraulic classifier in order to prevent the escape of coarse material and return it to the rest of the coarse escaping separately from the classifier. The screen is prevented from choking by continual agitation, and is placed nearly vertically, so that particles tend to drop off it instead of remaining upon it till otherwise discharged, as with existing screens. Hence the larger portion of the coarse material never comes into contact with the screen at all, and a screen of given area has a greatly increased output as compared with other methods of sifting pure sand, and further, both the coarse and fine products are much more nearly perfectly separated than is possible with existing forms of classifiers."

Principles of the Apparatus.

The general principles are thus broadly indicated, but to make the working principles of the apparatus more clear it may be explained that it consists primarily of a deep box, with trough-shaped bottom, divided into two portions longitudinally by a partition which separates the inflow from the outflow side. The partition is so shaped that the inflow and outflow chambers are narrower near the bottom of the box than at the top. The unclassified sand from the dump is fed in at one side, as in an ordinary spitzlutten, and having arrived at the bottom of the box is subjected to an ascending stream of water properly adjusted to requirements. Classification at once commences; the heavier and coarser particles settle towards the bottom and the finer and lighter ones ascend with the stream. In the ordinary way a satisfactory separation of coarse and fines could not be effected by this means, for a certain percentage of coarse material carrying small portions of auriferous pyrite would pass over with the finer material. Since the efficiency of any process which is proposed for the retreatment of the dumps depends upon the degree of perfection to which the separation of coarse material that requires regrinding is made from the finer product that merely requires cyaniding, it is obvious that this mixed product is that which has to be particularly considered. A screen of suitable mesh suggested itself at an early stage of the inventor's experiments, but the difficulty was that it rapidly became choked, and disorganised the process. Tapping was found only partially successfully, and then, happily, the idea of a quick short reciprocating movement suggested itself. It was found to overcome the trouble with complete success, and then progress with the invention was rapid. In the latest type which is being installed at the Bonanza, the partition is made so that the inflow separates at the bottom to the two sides, thus practically forming two machines in one.

The fine material passes easily through the screen, and no portion whatever of the coarse sand escapes. The remaining problem of separation is thus between coarse particles of uncertain momentum and the finest slime that rises to the overflow at one side of the box and a little below the level of the top of the screen. The matter is obviously a simple one. A great deal of the slime escapes, of course, through the screen, but the subsequent separation of fines and slime for cyaniding purposes is not a difficult operation.

Products Obtained.

Primarily there are two distinct products of classification; coarse, for regrinding, and fine for direct cyanidation. In practice three grades will be made, as explained by Mr. William Laurie Hamilton in his report dated 18th November, 1911, as follows:

"Thus the Stanley classifier separates the original sands of the dumps into three sizes:

"(1). Concentrates, which consist mostly of +60 and any fine pyrite, ranging from 25 to 45 per cent. of the total bulk, and carrying from 40 to 60 per cent. of the total gold.

"(2) 'Fines,' which consist of −60, and about 3 to 4 per cent. of +60, and ranging from 70 to 55 per cent. of the total weight or bulk, carrying usually from 30 to 45 per cent. of the total gold.

"(3) Slime, which overflows the classifier or is separated by a thickener afterwards; this amounts to 3 to 5 per cent. of the bulk, and is of higher value than the original."

As was pointed out in a previous article, the working cost of the process is not expected to exceed 2s. per ton treated under reasonable conditions, including transport, classifying, grinding and cyaniding, and there is evidently a considerable profit to be made on this basis out of those dumps which were accumulated before the inauguration of fine grinding in the tube mill. At the Bonanza where an old plant has had to be adapted, costs will be higher.

The operations at the Bonanza will naturally be watched with the greatest interest by all who have classification problems to solve, as well as by those who have assets in the shape of dumps worth from four to eight shillings per ton or so, and it is estimated that there are at least 70,000,000 tons of sand on the Rand which average something between those limits. It would be unpardonable extravagance to send material of this value back to the stopes as long as there remains a chance of making a respectable profit out of it.

SOME REASONS WHY MINING LANGUISHES.

Mr. Sidney Jennings makes another Thought-compelling Contribution to Mining Economics.

The United States Smelting, Refining and Mining Co., besides being a mining and smelting company, is one of the important exploration companies; *i.e.*, it is constantly searching for new mines, and for that purpose maintains an exploration department under the direction of a distinguished engineer, Mr. Sidney J. Jennings. The experience of this company in this branch of its business is illuminating as to several things, among them some reasons for the languishing of the mining industry. The experience of Mr. Jennings is not unique; indeed, we recollect some figures given by Mr. H. C. Hoover that were of the same order; but Mr. Jennings is the only one who publishes them regularly. The following is an excerpt from his report to his company for 1910:—

"During the year ending December 31, 1910, 684 separate mining propositions were presented for the consideration of the exploration department of your company. An examination of the reports submitted, together with a knowledge of the districts in which the properties were located, was sufficient to warrant the rejection of 514. On 124 properties a preliminary examination was made by the engineers of this department, with the result that no further work was recommended to be done on these properties. On 46 properties, on which a preliminary examination had been made, further work was recommended, and a complete examination of these properties was undertaken, with the result that two properties were reserved for further consideration, and it is hoped that satisfactory terms can be arranged for their purchase during the coming year."

The following is from Mr. Jenning's report for 1911:—

"During the year under review, 921 properties were considered. This does not include propositions that were refused on the face of the statements made. An examination by the office nearest the property concerned, coupled with knowledge of the geology and working costs of the respective districts, was sufficient to warrant refusing 749 of the propositions submitted. A preliminary field examination of 144 properties was made, and 28 properties were subjected to a complete sampling and examination, with the result that one property was taken over."

Thus, it appears that out of 268 mines examined during two years only three were finally acquired, and this during a period when the mining industry was relatively inactive and the price of mining property relatively low, like other prices. It is not to be inferred from these figures that out of the mining property in the market 99 per cent. is valueless; rather do the figures point to the inability of buyers and sellers to come to terms. Commenting on these figures, the *Engineering and Mining Journal* of New York says that the United States Company is an important and active concern, and it is a reasonable assumption that a large part of the mining property in the market is offered to it at one time or another. Its consideration of 1,605 in two years, exclusive of what was summarily dismissed on the face of the vendors' statements, is indicative of that. Also the actual examination of 268 is indicative of a rather high proportion of merit. In that examination it developed, no doubt, that many properties had been misrepresented and could be rejected after a brief reconnaissance, but it is equally probable that many possessed fair prospective possibilities, but had to be dismissed because of the exaggerated ideas of their owners. Experience teaches that the common idea among mine-owners is to demand all that a mine has actually developed, plus all probability, computed as to net value on the basis of what the large company can accomplish by virtue of its superior organisation, knowledge, and command of capital. The standing upon such a demand is, of course, obstructive, because there is no use for a buyer to acquire a mine if he has to take all the chances and can only get his money back if all hopes are realised. The view of the purchaser is to pay for the ore developed plus a reasonable allowance for probability, figuring net value on the basis of what the owner can accomplish in his own working.

Swaziland Gold Exploration and Land.

The report of the Swaziland Gold Exploration and Land Company, Ltd., for the year ended 31st December, 1911, submitted to the meeting on the 12th inst., states that since the close of the year a further amount of 5s. per share has been called up on the Preference shares. The property of the company remains the same as last year, but the directors have been in negotiation with the Government for the sale of the mineral rights over a small area of some 75 morgen, notice of expropriation of which had been given by the Government, in connection with its recent decision to proclaim Bremersdorp to be a township. The directors have to report that there has been very little, if any, change in the condition of affairs in Swaziland during the past year. Pending the construction of the railway, there has been a continued absence of interest in the country generally, but more particularly in mineral areas, such as that owned by this company, which are situate in the interior districts; consequently, the efforts made to attract attention to the property, with a view to its further exploration and development, have so far proved unsuccessful. It is hoped that the Government will very shortly announce its decision to forthwith proceed with the construction of the railway, and thus, by ensuring direct and easy transport facilities with the Transvaal on the one hand, and Delagoa Bay on the other, remove the chief obstacle standing so long in the way of the development of the country's resources.

THE RAND GEOLOGICAL CONTROVERSY.—II.

Mr. J. S. Olver's Criticism of Dr. Mellor's Views—Miraculous Effects of Pressure on the Lower Witwatersrand System.

The most remarkable feature of Dr. Mellor's reading of Rand geology is the evidence of intense compression which is supposed to have eliminated in turn nearly every bed in the Lower Witwatersrand System from the Orange Grove Quartzites up to and including the lower part of the Government Series. A section from north to south about a mile west of the eastern boundary of Elandsfontein 147 would show—if constructed from Dr. Mellor's data—that the bottom part of the formation, up to the base of the Hospital Hill Quartzites, was entirely absent; that the lowest of the three beds of Hospital Hill Quartzites remained practically intact; and that the upper beds of that series, together with the whole of the "Promise" and "Coronation" Series, had vanished. The disappearance of the lowest series is complete, and though one cannot be quite so definite about the upper elimination, since something depends on Dr. Mellor's identification of individual beds—this general statement seems to convey a fair impression of his view of the position. This means that, out of a total thickness of about 8,500 feet which Dr. Mellor gives as the normal thickness of the system up to the base of the Government series, a thickness of only about 1,000 feet remains; or, not to overstate the case, I will say that at least three-quarters of the lower part of the system has been eliminated.

I gather that the whole of this alteration is supposed to have been caused by squeezing. It must be admitted that this is a very impressive manifestation of the power of natural forces; and be it understood that the eliminated beds are not merely the softer members of the system, but comprise several thick beds of the hardest quartzites. What has become of missing series? Have they been extruded on the surface and eroded away, or have we here something approaching the annihilation of matter? I cannot even guess what Dr. Mellor's views on this point may be, but I am on safe ground when I say that squeezing of this kind could not possibly occur without leaving very marked evidence of pressure on the remaining beds. It is true that the rocks which make up the main ridge on Elandsfontein show obvious signs of twisting and faulting, but the marvel is that they have survived at all as recognizable beds when their companions have completely succumbed. They certainly do not show anything like the alteration which one would expect to find in beds which had been subjected to such stupendous pressure. Not only do both quartzites and shales retain their identity, but several banket beds which are included in the affected zone show no signs of crushing. It cannot be claimed that the lowest bed of the Hospital Hill Quartzites has a special immunity from crushing, seeing that this bed is also supposed to have been squeezed out of existence at more than one point farther west.

Assuming such intense pressure to be developed in and around the lower part of the Witwatersrand System, what might be considered the *minimum* area or thickness over which that pressure would be felt? It is inconceivable that such forces could be confined within narrow and definite limits; and, when it is remembered that the distance which separates the Main Reef series from the eliminated beds is less than the original width of the affected beds themselves, it seems hardly credible that that series could escape uninjured. Yet I think most people who have an intimate knowledge of the Main Reef series will agree that it shows very few signs of squeezing. Its various beds are distinctly lenticular in character, but I know of no single instance in which a change in width over any considerable area can be attributed to compression.

But perhaps the most remarkable instance of the immunity of the surviving beds from the effects of pressure—if Dr. Mellor's ideas are to be accepted—is that displayed on the east side of the fault just west of the old Geldenhuis mill. Here a width of some 7,000 feet of quartzites and shales, from the base of the Hospital Hill Quartzites up to the footwall of the Government Reef itself, has been entirely eliminated. Some of the eliminated beds are, on Dr. Mellor's own showing, amongst the most resistant in the Lower Witwatersrand System. To use a simple illustration, it will be agreed that when one cracks a nut with a pair of crackers, the pressure on each face of the crackers is the same as that on the nut. The jaws of the crackers are uninjured merely because their hardness is out of all proportion to that of the nut. Now, in the instance with which I am dealing, the bed which corresponds to the one jaw of the crackers is the Hospital Hill Shales, while the Government Reef represents the other jaw. (I do not agree with Dr. Mellor's identification of this reef, but that does not matter for the moment.) No one will, I think, contend that either of these beds is so hard that it is capable of conveying pressure sufficient to squeeze out 7,000 feet of quartzites and shales—including such hard rocks as the Hospital Hill Quartzites—without suffering some injury in the operation. Without going into wearisome details, I may say that I could narrow the present distance between the planes which are supposed to represent the two faces of the crackers down to, say, ten feet at the most. Yet, even within that ten feet, the rocks show no obvious signs of crushing, while both the upper and lower beds appear to be in a perfectly normal state. It is no exaggeration, but a mere statement of plain fact ,to say that such disparity of effect—total destruction on the one hand and complete immunity on the other—could only result from a miracle.

I might go on to deal in a similar way with the other supposed cases of elimination, but I think I have said enough to justify my previous statement that Dr. Mellor's deductions are too sensational to be accepted without the strongest possible proof. What, then, is his evidence for the extraordinary compression of the Lower Witwatersrand System? He said in his first paper, p. 28, ". . . . perhaps the most striking evidence of the magnitude of the disturbance is its effect in bringing the Older Granite into contact with the Hospital Hill Quartzites about Rietfontein, a point which I believe has escaped the notice of previous observers, but one which has led me to devote very close attention to the collection of evidence which may contribute to the elucidation of what must be regarded as one of the most important structural feature of the Central Rand." Again he says on the next page: "The Older Granite . . . was first met with in tracing the northern boundary-line of the Hospital Hill Quartzites; and the striking evidence it afforded of a break of considerable magnitude has been fully confirmed by the conditions found to obtain in the country further east. . . . On account of the shearing to which the rock has been subjected, these outcrops may easily be passed over as quartzite. Where, however, any portion has escaped shearing, the character of the rock is well seen and is unmistakable. . . ." (By the way, is it not strange that any part of this granite, in contact, as it is, with the alleged zone of greatest compression, should have escaped shearing? The metamorphosis there does not seem to be greater than it usually is along the junction of the granite with the Witwatersrand System.)

Mr. A. R. Sawyer, in his contribution to the discussion on Dr. Mellor's second paper, quoted from a private report to show that he had previous knowledge of the presence of the granite in the Bezuidenhout Valley, and that the relation of the overlying quartzites to the granite had led him to correlate them with the Orange Grove Quartzites, instead of with the Hospital Hill Quartzites. The latter correlation was adopted by Dr. Mellor, and on this point he seems to have followed the orthodox school. Mr. Sawyer's correlation was, of course, the obvious one, and the *onus* of proof lies on those who have taken the other view. There can be no doubt that that other view was based on the presence of the

Hospital Hill Shales at the back of the ridge to the south-west of Rietfontein. I at once admit the weight of this evidence. The outcrop of the Contorted Bed is approximately parallel to that of the quartzites, and the relation of the two beds to each other at this point is very like the normal relation of the Contorted Bed and the Hospital Hill Quartzites. It must be noted that, as Dr. Mellor himself points out, the Contorted Bed does not continue to the west; but, still, its position near Rietfontein is strong evidence for the correlation with the Hospital Hill Quartzites. It is, however, at the best no stronger than the opposing evidence of the granite in favour of the correlation with the Orange Grove Quartzites. These two pieces of argument may, then, be fairly taken to cancel each other, and the correlation must be grounded on other evidence.

I have from the first identified the northernmost quartzites in this ridge as the Orange Grove Quartzites, and I submit that the faulting which I have employed to explain their presence so far south is beyond all comparison simpler than the complicated and wonderful phenomena which are involved in Dr. Mellor's theory. But my reading has much more to be said for it than its mere simplicity. Take, first of all, the character of the quartzites themselves. In the first appendix to his second paper Dr. Mellor writes of the lowest bed of the Hospital Hill Quartzites as follows, *inter alia*: "About 100 feet at bottom inclined to thin-bedded and flaggy structure, *passing gradually into the shales below*. In several localities shows a wash of small pebbles scattered through one of the quartzite beds in the lower part of the band." The italics are mine. Referring to the Hospital Hill Quartzites as a whole, he says: "Usually pale yellowish in colour, or light reddish brown. Frequently tinged with pale green, especially on bedding planes." In the body of the paper, p. 107, he says: "Although a similar green colouration is sometimes observable in almost all the other quartzites of the Witwatersrand System, and may be locally absent or poorly shown in the Hospital Hill or Green Quartzites themselves, it is, generally speaking, a very characteristic and persistent feature in the latter beds not only on the Witwatersrand but also in other localities." He also refers to the characteristic "sago" grains, but he lays less stress on this feature than Drs. Hatch and Corstorphine did or I myself should do.

Speaking generally, I accept the above as a fair description of the typical Hospital Hill Quartzites, and I attach special importance to the gradual change from quartzite to shale, the "wash of small pebbles," the green colour and the sago grains. Now, I invite Dr. Mellor to apply his own test to the lowest quartzites in the southern ridge anywhere near the boundary of Elandsfontein and Barrett's Rietfontein. I maintain that no single one of the above characteristics is clearly represented there. These quartzites, in fact, show every typical feature of the Orange Grove Quartzites—the hard, white, glassy, fine-grained rock—thick-bedded and much more rugged than the Hospital Hill Quartzites usually are—the sharp demarcation between the quartzites and the underlying schists.

Next let us take the upward succession from those quartzites. It must be admitted at once that this succession is a good deal disturbed by a series of longitudinal faults, but in any case both parties to this discussion are beset with the same difficulty. The first bed should be the Blue Shale, and this is well represented at several points, though not continuously. About midway between the east and west boundaries of Elandsfontein there is a semi-detached kopje, and Dr. Mellor seems to refer to this when he says in his first paper, p. 32, "and a faulted portion of the ridge projects some distance beyond the general line of the escarpment into the flat." This, I maintain, consists of two beds of typical Orange Grove Quartzites separated by a bed of shale. Dr. Mellor's description of the shale which separates the two lowest beds of quartzite in the Witwatersrand System—"about 40 feet of easily weathered pinkish sericitic schistose or shaly beds"—with my own addition that, when unweathered, these rocks are blue, may be very well applied to the shale in this kopje.

Just west of this kopje there is a prominent outcrop of what appears to be perfectly typical Water Tower Shale. This bed runs south of a parallel to the beds in the kopje, *i.e.*, in the proper relation of the Water Tower Shales to the Orange Grove Quartzites, and it can be followed, with a few unimportant breaks, for miles to the east. The thickness of the various beds in the Orange Grove and Water Tower series is gradually modified in going east, and the black and most magnetic portion of the Water Tower Shales becomes less conspicuous. Now, if any one will take the trouble to examine these two series going eastwards from Orange Grove, on the northern side of the Bezuidenhout Valley, he will find that similar gradual changes take place there; and, if he will compare these two series at a point, say, half-a-mile east of Orange Grove with the beds in the southern ridge about the middle of Barrett's Rietfontein, he can scarcely fail to be struck by the resemblance between the two successions. Here, then, unless my observation is extremely faulty, we have very strong support for the correlation with the Orange Grove Quartzites. I could continue the correlation of the succession right up to the Government Quartzites, but Dr. Mellor claims that what I identify as the Hospital Hill Series at that point is the "Coronation Series," and I therefore prefer to continue the attack on his positon from another direction.

(*End of Part II.*)

RIETFONTEIN—VAN RYN EXTENSION.

Further Particulars of New East Rand Venture.

A SYNDICATE, under the title of the Rietfontein-Van Ryn Extension Syndicate, Ltd., with a capital of £40,000 in £1 shares, of which 5,000 shares represent working capital and 7,500 shares are in reserve, is being floated for the purpose of taking over certain prospecting plant and all the vendors' right, title, and interest, including obligations, in various contracts. These refer to ground held by Neubauer, Goldberg, Davies, and Debell on the farm Vogelfontein, in the neighbourhood of Boksburg. Those who know the district will recognise this area as being in the north-east corner of the farm, and commonly known as Debell's ground. The last to prospect these claims was the Atlas Syndicate. Other areas referred to in the contracts are claims known as Humphreys' claims, east of the former block, and lying on the farm Benoni, on the joint Rietfontein-Benoni boundary. Another contract deals with 148 morgen 588 square roods, or thereabouts, held on Klipfontein by Jas. Watt, and, finally, there is a contract with Henderson's Transvaal Estates regarding a certain portion of the same farm. There are also concerned some 304 prospecting claims on Driefontein, belonging to the Du Preez Consolidated, Ltd., and certain other 104 prospecting claims adjoining, and making one block of 408 with the former. According to a map published with the prospectus, which is privately circulated, the sub-outcrop of the Van Ryn-Rietfontein, in accordance with the theory of Mr. Wm. Bleloch, traverses the area in question from the south-east corner beacon of Rietfontein, through the centre of the western boundary of Klipfontein, thence past the north-east corner beacon of Boksburg North, and more or less directly to the western boundary of Humphrey's triangular block. Bending north-eastwards, it runs inside the north-facing boundary line of Humphreys' block, and thence on to Benoni and Kleinfontein. "The area covered by the whole of the ground and claims is said to extend for about 5¼ miles along the course of the reef series. The directors are Messrs. Giles Oats, W. E. Bleloch, and John Nicol Sellar.

THE CAMPAIGN AGAINST PHTHISIS.—II.

Apparatus for Sampling Air for Dust—Inventions by Messrs. Laschinger and McArthur Johnston—A Simple Device at the Dynamite Factory.

In our last issue, it will be remembered, reference was made to the fact that the whole of the work of the Ventilation Sub-Committee of the Miners' Phthisis Prevention Committee had, according to the evidence of Mr. E. J. Way before the Select Committee in Capetown, been spent in endeavouring to devise a machine which would correctly show the amount of dust in a given quantity of air. It was a much more difficult matter, he remarked, than it appeared to be. At present a machine had been devised, upon which certain experimental work would go on, but the Committee had been obliged to order a specially designed machine from a Cambridge manufacturing company, which would take some months to get here. The following notes are taken from a description of the apparatus given by Mr. E. J. Laschinger, at the last meeting of the Chemical, Metallurgical, and Mining Society of South Africa.

The Laschinger Apparatus.

In the determination of dust held in suspension in air, it was explained, in cases where the quantity of dust is not great and the particles very small, it is essential to draw a large sample of air through the filtering and collecting medium in order to obtain a reliable sample. To obtain an accurate result, it is, of course, also essential that the air sample should be measured accurately. In order to obtain accurate results more quickly than by existing methods, Mr. Laschinger, at the request of the Ventilation Sub-Committee of the Miners' Phthisis Prevention Committee, designed two methods of collecting samples. One apparatus was constructed locally for immediate use, and another of different construction is on order from oversea. The sampling apparatus originally used in the committee's work was a plain aspirator tank of about 2 cubic feet or 50 litres capacity, and owing to the high resistance to the air in travelling through the dust collecting medium, it required about one and a half hours to collect a sample of dust from 2 cubic feet of air. The first-mentioned apparatus consists of two aspirator tanks in combination. Each of the aspirator tanks is fitted with a half-inch bib-cock, with screw hose connections and a gauge glass near the bottom of the tank to indicate water level when the tank is nearly empty. On the top of the tank are two plain ferrules, into which rubber corks may be inserted to close them. The rest of the apparatus consists of a small hand pump and 20 ft. of half-inch hose cut in two, one half being used for the suction and the other for the delivery of the pump. The method of taking a sample is as follows:—One tank is filled with water up to the top and the other is partly filled up to a mark on the bottom of the gauge glass. In one ferrule on the top of the tank is inserted a perforated rubber cork carrying the dust sampling tube, and in the other ferrule a cork carrying a vacuum gauge. The pump is connected by its suction hose to the bib-cock, and the delivery hose is inserted into one ferrule on the partly filled, or first, tank, the other ferrule being corked and the bib-cock closed. By opening the bib-cock and operating the pump, the water is transferred from the filled to the partly filled tank, until the latter is full and the first is emptied to a mark on the gauge glass. A strong vacuum is induced in the first tank, which draws the air through the collecting tube. The object of the vacuum gauge is to minimise the time required to complete an operation. After the water has been drawn from the first tank it may take a long time for the pressure inside the tank to balance with that of the outside air as the difference in pressure decreases slowly, but by observing the reading of the vacuum gauge and then quickly pulling it out, the volume of air at atmospheric pressure (free air) which has already been drawn through the collecting tube is easily calculated:

Let v be the volume of water drawn from the tank.

Let B be the reading of the barometer in inches of mercury.

Let V be the reading of the vacuum gauge in inches of mercury at the time it was withdrawn from the tank.

Let Q be the volume of air at atmospheric pressure drawn through the collecting tube.

$$\text{Then } Q = v\,\frac{B - V}{B}$$

The second tank is now full, and if the collecting tube and vacuum gauge be transferred to it, the suction hose connected to the cock, and the delivery hose inserted into the ferrule, the water may now be pumped back, and an additional amount of air drawn through the collecting tube. By a repetition of these reversals, any desired quantity of air may be sampled. In general, with fine sugar as the collecting medium, one operation will take about five minutes instead of one and a half hours. This apparatus was hurriedly constructed locally, and did not cost more than £7. It has been in successful operation now for a few weeks for dust determination in the streets of Johannesburg and in the mines. While the above apparatus is satisfactory, it is not so convenient and portable as one could desire for underground work. With a view to having an apparatus which should be convenient in operation so that the work of conducting the tests and working out the results is reduced to a minimum, with weight and bulk as small as possible, another apparatus was designed. This apparatus consists of a small dry air pump to be worked by hand, a small receiver to equalise the pulsation of air pressure in the suction of the pump, and a small orifice through which the air is drawn after passing through the dust collecting tube. This orifice is the air meter, and the flow of air is calculated from figures obtained by observing: (1) The barometer reading; (2) the indications of a vacuum gauge connected to the receiver; and (3) the indications of a gauge which gives the head or difference of pressure, between the two sides of the orifice plate.

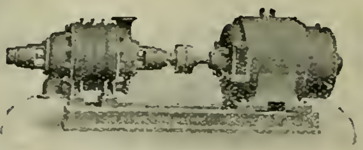
The method of making a determination is as follows:—Fix the dust collecting tube into the mouth at the top of the apparatus by means of a rubber cork, and close the cock on top of the receiver; then start the pump until a certain predetermined suction is indicated on the vacuum gauge. Now open the cock and take the time of opening. Then, by means of the pump, keep the vacuum gauge and the orifice gauge at constant readings till sufficient air has been drawn through the apparatus, and close the cock, noting the time of closing. Also observe the reading of a pocket aneroid barometer. It is also desirable to record the temperature of the air. The rate of flow in cubic feet of air per minute multiplied into the time in minutes of the test will give the total cubic feet of free air passed through the apparatus. It might be mentioned there is a high degree of accuracy in this method of air measurement, and in a calibrated apparatus there should not be more than 2 per cent. of error in the calculated result. The over-all dimensions of the apparatus as designed are about 24 in. × 24 in. × 15 in., and the weight should not exceed 50 lbs.

Mr. James Gray said: "I have been using the first apparatus described by Mr. Laschinger for some time now, and have found it to be very suitable for the purpose, even although it is rather cumbersome. With regard to the time necessary to collect the sample, I would point out that this should be 40 min., not 20, *i.e.*, 5 min. to transfer the 50 litres from one tank to the other, and 5 min. to allow the vacuum to go back to atmospheric pressure, a total of 10 min. or 40 min. for 200 litres. This is a considerable improvement over the old apparatus, which took 1½ hr. to collect 50 litres. The experimental error is also considerably reduced. The type of tube illustrated by Mr. Laschinger has been found most effective. But I think that the adoption of the tube suggested by Mr. Johnston would result in the time necessary for the collection of the sample being considerably reduced. The thanks of those who have anything to do with dust collection are due to Mr. Laschinger for his work in this matter."

FILTRATION THROUGH SUGAR.

Mr. A. McArthur Johnston described another apparatus, as follows:—"The collection of dust in air by drawing the latter through a layer of sugar is mentioned by Soper in 'Air and Ventilation in Subways.' After a number of tests carried out by aspirating both surface air and underground air through sugar, and after comparing the results obtained with those found by using cotton wool, glass wool and water as the filtering media, we concluded that higher and more consistent results were obtained with the sugar, and for the last nine months we have been using this as the filtering medium with which to estimate the quantity of dust in mine air. The filter bed is obtained by coarsely crushing pure cane lump sugar and retaining that failing to pass a 90 mesh (aperture 0·006 in.) sieve. This is charged into a glass stoppered separator of about 25 cc. capacity. The layer of sugar should be about 2 in. in depth, and should be just slightly wetted to cause the dust to adhere to it, though not sufficiently wet to cause caking of the sugar. If found necessary, a small piece of brass or copper wire gauze is placed in the bottom of the separator to prevent the sugar escaping. The amount of air to be aspirated through the sugar is dependent on the quantity of dust in the air. Thus, surface air might, after a shower of rain, contain such a small quantity of dust that it would be necessary to pass about 500 litres, or even more, through the sugar to obtain a weighable quantity of dust, whereas one-tenth of this amount would, under present conditions, suffice for ascertaining the amount of dust in the air of most of the mines of the Rand. After taking the sample, the separator is stoppered and placed in a box to avoid contamination. To estimate the dust, the sugar is dissolved in distilled water and then filtered through tarred filter papers of the best quality, or through a layer of asbestos in a Gooch crucible. The weight found represents the total dust present. By incinerating this, the amount of mineral dust may be determined, the difference representing the organic matter. It is usual to express the results in grains per cubic metre, though some chemists still adhere to grains per cubic foot. (Grams per cubic metre × 0·437 = grains per cubic foot). When it is desirable to estimate in mine air only the finest particles of dust, a sieve may be used to eliminate all those larger than 0·003 in. in diameter. The standard 200 mesh per linear inch sieve may be employed, but the precaution of washing this into the sample must be taken, for when the air is moist there is every probability that a portion of the finest dust may be retained by clinging to the wires. I need scarcely mention that every precaution to avoid contamination by laying the glass apparatus on the ground or on ledges of rock should be taken, whilst of course when it is found that the sugar contains any dust, blank determinations should be performed and allowance made for this when reporting the result."

In the discussion which followed, Mr. W. Cullen said:—"The two papers which we have listened to have been extremely interesting, and the authors deserve our cordial thanks. It has just struck me, however, that an even simpler device could be used than that recommended by Mr. Laschinger. I do not say that it would be so accurate, but, in my opinion, it would accurate within 5 per cent., which is near enough for all practical purposes. The alkali inspectors in England use a particular type of bellows for sampling flue and chimney gases, and the degree of accuracy which they obtain satisfies them. If Mr. McArthur Johnston's appliances were fitted into the inlet of these bellows and a suitable exhaust valve provided, then all one would have to do would be to work these bellows like an ordinary concertina, and their capacity, multiplied by the number of times they were filled, would give the amount of air which had been passed through. The apparatus I have described could be put into the care of an absolutely unskilled man, who would work at playing his 'concertina' all day, while a chemist would deal with the dust caught in the sugar by the method prescribed by the author. Mr. Laschinger's apparatus, I have no doubt, will give all the accuracy which is desired, but it strikes me as being somewhat cumbersome; however, only those who have actually experimented with it are entitled to speak with any assurance on the point. The apparatus mentioned by both authors involves the principle of evacuation, and at Modderfontein we have adapted this same principle to the sampling of mine gases. The method simply consists of detonating the explosives under practical conditions inside an iron chamber, which is almost air-tight, and immediately after the explosion drawing out the gases by means of a pump which may be situated at any convenient distance; obviously one cannot do the same on the mines, but as we have found out by practical experience that our imitative conditions produce exactly the same effect as is produced on the mines, the advantage gained is obvious indeed. Reference has been made by more than one speaker to the chance of the dust not having been completely removed from the mine gases, and this is a possibility which cannot be overlooked. I have little doubt myself, however, that after experience has been gained the passage of the gases will be so regulated that it will be impossible for any dust to escape. There is, however, a very simple method of telling whether dust is in the gas or not, and I only mention it because of the fact that the Miners' Phthisis Prevention Committee are going into this question very fully just now. If one takes an ordinary piece of iron piping, 2 in. or more in diameter and 5 ft. to 6 ft. long and closes up each end with a piece of ordinary glass, while keeping an electric light burning at the one end, it is possible by looking through the pipe from the other end to detect the slightest traces of dust, of any kind. At the Dynamite Factory we have used this simple test with great success for a number of years, but obviously to make it of any use for the work now being carried on, certain standards would require to be established and certain very definite comparisons made."



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THE MINERALS OF THE MURCHISON RANGE AND DISTRICT.—III.

Account of the Haenertsburg and Woodbush Goldfields—Gold-bearing Deposits of the Black Reef Series—An Important Government Report on the Results.

"The Pyritic Reef dips at 80 deg. north in agreement with the general dip of the schist planes in the neighbouring rocks; and it is from two to seven feet in width, averaging four to five feet. In some places the reef is sharply defined from the country schist, while in others it merges more gradually into them by the increase in width of the talcose partings between the more quartzose bands. In places rock similar to the country schists divides the reef into two or more portions. The reef presents a similar appearance at a depth of 400 feet to that shown in the upper levels of the mine. The Pyritic Reef is stated to yield satisfactory gold values and to be very consistent throughout its extent."* The mode of occurrence of lenticular reefs is also shown at the old Free State Mine, in case of the Main and South Reefs. "The Main Reef consists for the most part of coarse reef quartz, mingled with calcite, dolomite, and iron carbonates. In some places the carbonates predominate, and are aggregated in vein-like masses in the quartz. Antimony (Antimonite) and gold occur throughout the vein, the former in bunches and masses of considerable size, the latter occasionally visible in coarse grains in the quartz. The reefs dip steeply at about 80 deg. to the north, varying from this to an almost vertical position. The strike agrees with that of the planes of schistosity of the country rock. Like nearly all examples of this type in the district, the reef varies much in thickness, both horizontally and vertically. It ranges for a considerable distance between three to ten feet. In one place it attains a width of nearly twenty feet, while in others it disappears, to appear again or to be replaced a little further on by a similar lenticular body, not necessarily on the same line as the strike. The South Reef at the Free State Mine presents similar characters to the Main Reef above described."† Outside the Antimony and Spitzkop belt, economic deposits have been worked at the Sutherland Reef on the Potsdam Mynpacht, about four miles west-south-west of Leydsdorp, at the Griffin Mine, five miles south-east of Leydsdorp, and in the extreme western end of the range not far from the base of the Black Reef Series. The workings of the Sutherland Reef Gold Mining Company are situated on the farm Potsdam No. 312, and are associated with a conspicuous straight ridge, surrounded on three sides by bushy granite flats. On the south side and even more clearly on the north side of this ridge, along the track leading from the main road southwards at the old Murchison Crown Mine, the Older Granite is seen to approach closely to the ridge, on which the old workings are situated. The deposits of the Sutherland Reef Gold Mining Company are on the whole best assigned to the group of mineralised zones. During past years considerable underground work has been done at this mine, and some of the workings have reached a depth of 600 feet. Operations have been suspended for a number of years, but interesting evidence can be seen at the surface. The country rock consists of a considerable succession of thinly bedded, soft, dark dull greenish monotonous phyllites, which were referred to in Chapter V. with reference to their chemical composition, which shows a high percentage of alumina. The dip is from 60 deg. to 70 deg. to the south, while the strike maintains an easterly direction with a slight tendency to the north. Some varieties of the phyllites are light greyish harder rocks, impregnated by disseminated cubes of fresh yellow and brown pyrites (447 C_3); other phases are rich in irregular films, layers, or patches, composed wholly of black mica interleaved with streaks of fresh pyrites, sometimes drawn out into flattened lenticles (478 C_3); in still other varieties there are irregular veins and masses of dull grey crystalline rhombohedral carbonates (475 C_3). Two zones of auriferous deposits are recognised, the Sutherland Reef more towards the north, and the Christmas Reef more towards the south. The Sutherland Reef is a mineralisel zone in the phyllites and is associated with interbedded lenticles of "hungry" white glassy to sugary quartz; this belt has no defined hanging or footwall, and varies from seven feet in width downwards. The quartz zones are very erratic, repeatedly "come" in or "make," and rapidly die down or temporarily vanish altogether, as may be well seen in an open surface cutting at the main headgear, and imply rather a zone of impregnation than a defined reef. The gold occurs visible, both in the green phyllite and in the "hungry" quartz as minute scattered particles. Due to subsequent movements, a small amount of gold may become spread out over a large surface of phyllite—so-called "Paint Gold." In the underground workings an "indicator" has been noticed consisting of a hard, fine-grained, dark-coloured younger intrusion, five to two feet wide, which behaves like an interbedded sheet and follows the Sutherland Reef a few yards to the north. The Christmas Reef has so far not been developed beyond the prospecting stage; it overlies the Sutherland Reef at a distance of about forty feet, as shown east of the old headgear, in a long narrow trench. The reef constitutes a zone of mineralised rock up to nine feet in width, and composed of yellowish-brown schists with partings of impure granular quartz, usually in vein-like habit, both parallel and across the schist planes. Soft green chloritic partings also occur. There is no defined foot or hanging wall, the reef representing an auriferous band in the country rock traceable at several places along the strike, always above the Sutherland Reef.

The Griffin Mine is situated five miles south-east of Leydsdorp on a broad belt of higher ground mainly due to green schists with marked igneous characters. The highest point along this ridge carries the Lion beacon, from which the mine is situated two miles to the east. The country rock forms a variable succession of pale greenstone schists with sometimes amphibolite characters; certain varieties are more coarsely schistose with thin layers of fresh rhombohedral carbonates arranged parallel to the schist planes. The groundmass between these layers consist of densely packed oriented aggregates of amphibole needles arranged with a long axes parallel to the direction of schistosity, but also occurring scattered irregularly throughout the mass. In other varieties broader bands of very finely granular quartz, varying from half an inch down to mere siliceous films are found and oriented with the schist planes, while locally the rock is very richly impregnated with small crystals of pyrites sometimes concentrated into larger patches, which sometimes show a more linear distribution along streaks and veins. The aspect of the rock as a whole indicates an amphibolite schist subsequently silicified and charged with dolomite infiltrations, accompanied by impregnations of much fresh pyrites over certain portions. The Griffin Reef is a very irregular body of impure brownish to white glassy quartz roughly interbedded with the schists and attaining a width up to two or three feet; it dips conformably with the schists 60° to 70° to the south, becomes locally broken up, and divides into numerous thin subsidiary reefs 2 ins. to 3 ins. thick, or passes into a highly irregular breccia along local crush zones, for which reason it becomes difficult to follow. Frequently visible gold is found in scattered specks, associated with copper pyrites.

Along the extreme western portion of the Murchison Range auriferous deposits have been located south-west of Thabina, associated with the old workings of the Selati Gold Mining Company, at the old Flying Dutchman on Maake's Location, and at Beckmann's Workings still further west, close to the base of the Black Series. At the last-named locality a number of parallel reefs have been exposed, consisting of brownish-grey finely crystalline quartz with very thin yellowish rusty brown ferruginous partings. The quartz develops a cellular or cavernous appearance owing to the oxidation and removal of pyrites. The reefs run with the planes of schistosity are up to two feet thick; the country rock is a thinly schistose dull whitish tourmalinised and sheared quartz porphry, described in Chapter V.

3. *The Mica and Corundum Deposits south-east of Leydsdorp, of Malelane, east of Palabora, and Elsewhere.* In the present portion of the Low Country deposits of mica occur mainly at two localities: (a) along the northern side of the Olifants River near its junction with the Macoutsie, and thence eastwards; (b) at Malelane, near the confluence of the Malelane and Olifants Rivers, roughly twenty miles east of Palabora and seventy-five miles from Leydsdorp. The most extensive occurrence of mica is associated with the Olifants River Mica Fields, about twenty-two miles east-south-east of Leydsdorp, specially on the farms Islington No. 2017, Inyoka No. 1637, and Excellence No. 309, also on the south side of the Macoutsie River. The mica occurs in very numerous and conspicuous coarse white granite pegmatites, which are intrusive into the Older Granite, gneisses, and basic schists. The distribution of the mica is obviously dependent upon that of the pegmatites. A more extended examination of this part of the country, from Islington to April Kop, along the northern side of the Olifants River, and of the ground succeeding the Mashishimala Hills on the north-west, shows that the pegmatites markedly increase in abundance as one approaches the limits of the Palabora Plutonic Complex. For reasons given in Chapter VI., the latter is regarded as a younger group of granites, syenites, and pyroxenites intrusive into the Older Granites and gneisses. The zone of pegmatites stands in direct relationship to the northern and southern margins of the Palabora granite, as very forcibly brought out along the main road leading from the Blue Jacket Drift on the Selati River across the Mashishimala Hills past Longwan's Kraal to the Mica Fields on the north side of the Olifants River. The sudden and almost complete disappearance of pegmatites as one enters the younger granite, and their equally sudden reappearance on passing across the southern limit back into the Older Granite area, is most striking. The pegmatites are coarse white irregular lenticular masses, without the least sign of shearing or having been otherwise subjected to pressure, and thus contrast strongly with the banded or sheared gneisses and gneissic granites, in which they occur and in which they were intruded. This intrusive relationship occurs at numerous localities, and is a firmly established fact; it shows that the older group of rocks had already acquired their oriented structures and been subjected to pressure before the intrusion of the pegmatites occurred. One locality was referred to in Chapter VI., where the same pegmatite vein cuts both the Older and the Palabora granite, so that it is difficult to resist the conclusion that the coarse mica-bearing pegmatites belong to the younger complex and have no genetic connection with the Older Granite, a view which, of course, does not exclude the fact that pegmatite may also be associated with the latter formation. Along the southern margin of the Palabora Complex, pegmatites occur widely distributed as much as three and a half miles away from the contact. It is also known that owing to the relatively greater amount of magmatic water, the viscosity of these acid portions is reduced and fluidity promoted. It was pointed out above that the Palabora Complex probably continues southwards underground at no great depth, as shown by the mode of occurrence and distribution of various small detached masses of syenite along the southern margin of the younger granite belt. For these reasons the widespread occurrence of the pegmatites outside the limits of its parent magma offers no particular difficulty.

(To be continued.)

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* E. T. Mellor, *loc. cit.*, pp. 40 and 41.

† E. T. Mellor, *loc. cit.*, p. 39.

RAND MINES' SUBSIDIARIES: A QUARTER'S RESULTS.

The following is a tabulated summary of the working operations of certain of the companies in which the Rand Mines, Ltd., holds shares for the financial quarters ended 31st January, 1912, and 31st March, 1912:—

	Rose Deep, Limited.	Geldenhuis Deep, Limited.	Ferreira Deep, Ltd.	Crown Mines, Limited.	Durban Roodepoort Deep, Ltd.	New Modderfontein G.M. Co., Ltd.	City Deep, Limited.	Village Deep, Limited.	Bantjes Cons. Mines, Ltd.	Modderfontein B. Gold Mines Ltd.	East Rand Proprietary Mines, Ltd.	The Village Main Reef G.M. Co., Ltd.	The Jupiter G.M. Co., Ltd.	Main Reef West, Limited.	Nourse Mines, Ltd.	The Wolhuter Gold Mines, Limited.
FINANCIAL QUARTER ENDING.. ..	March 31, 1911.														January 31, 1912.	
Mine																
DEVELOPMENT WORK—																
No. of feet driven, sunk and risen, exclusive of Stopes	3,899	9,103	3,152	11,168	4,486	4,170	4,520	4,915	3,562	419	11,527	953	2,237	2,261	5,951	2,621
MAIN REEF—																
Distance exposed (feet)	1,397	1,577	—	354	1,525	2,876	—	—	—	187		—	—	—	834	—
Width (inches)	31·0	23	—	22	25	12	—	—	—	7		—	—	—	25	—
Assay Value	38s. 2d.	36s. 11d.	—	10s. 4d.	38s. 8d.	152s. 5d.	—	—	—	168s. 0d.		—	—	—	12·3 dwts.	—
MAIN REEF LEADER—																
Distance exposed (feet)	1,056	2,622	1,081	5,216	—	—	3,015	1,252	305	—	21	321	—	1,592	1,144	—
Width (inches)	12·0	10	29	26	—	—	22	31	22	—		13	—	18	13	—
Assay Value	79s. 7d.	76s. 10d.	87s. 4d.	73s. 6d.	—	—	99s. 11d.	55s. 7d.	38s. 3d.	—	13·6 dwt	15·8 dwts.	—	5·7 dwts.	18·6 dwts.	—
SOUTH REEF—																
Distance exposed (feet)	1,011	2,733	1,124	2,445	1,755	—	199	1,425	1,400	—		333	—	—	1,057	—
Width (inches)	13·0	17	22	29	10	—	26	21	14	—		8	—	—	18	—
Assay Value	63s 11d.	57s. 1d.	81s. 5d.	43s. 3d.	139s. 10d.	—	12s. 10d.	58s. 1d.	77s. 3d.	—		20·2 dwts.	—	—	21·0 dwts.	—
Reduction Works																
Ore received from Mine (tons) ..	221,029	213,099	112,797	526,484	84,202	167,664	90,170	175,312	80,269	103,482	518,097	115,950	—	48,674	171,219	102,483
Ore received from Surface Dumps (tons)	—	—	—	—	—	—	50,088	—	—	—	—	—	—	—	—	—
Waste sorted out (per cent.) ..	13·1	18·9	18·7	12·7	16·9	12·0	17·4	15·5	16·7	10·5	8·9	14·6		12·1	15·3	11·1
Tonnage crushed..	191,300	172,960	90,840	458,900	69,825	147,530	115,830	117,400	66,810	92,600	171,750	98,070	106,200	42,765	145,100	88,400
Number of stamps operating .	306	330	160	660	100	180	110	180	60	80	820	220	88	73	260	120
Number of tube mills operating ..	7	7	4	22	3	7	9	6	3	5	—	—		2	—	4
Value of Ore before crushing																
Mill yield per ton	19s. 0d.	19s. 6d.	31s. 10d.	23s. 3d.	20s. 0d.	26s. 1d	21s. 7d.	19s. 11d.	18s. 5d.	19s. 5d.	—		—	—	—	—
Assay value of pulp	10s. 7d.	10s. 6d.	15s. 11d.	11s. 3d.	10s. 8d.	8s. 8d.	10s. 11d.	9s. 9d.	13s. 6d.	18s. 0d.	—	—	—	—	—	—
Total	29s. 7d.	30s. 0d.	47s. 9d.	34s. 6d.	30s. 8d.	34s. 9d.	32s. 6d.	29s. 8d.	31s. 11d.	37s. 5d.	—	—	—	—	—	—
Total yield (fine ozs.)	64,553	59,340	48,200	179,004	23.865	58,296	44,871	51,767	24.421	38.747	177,003	46,786	25,449	17,188	52,709	28,691
Yield per ton	28s. 4d.	28s. 9d.	41s. 6d.	32s. 8d.	28s. 7d.	33s. 1d.	32s. 6d.	29s 5d.	30s. 7d.	35s. 1d.	32s. 1d.	36s. 8d.	20s. 1d.	33s. 8d.	30s. 6d.	27s. 2d.
Accumulated slimes treated (tons) ..	—	5,070	—	5,519	—	6,641	6,630	—	—	—	—	—	—	—	—	—
Working Expenses																
Cost	£169,721	£208,441	£109,287	£426,178	£84,692	£112,202	£129,333	£146,255	£81,982	£88,187	£511,696	£119,381	£93,500	£48,300	£167,949	£74,633
Cost per Ton Milled	17s. 9d.	£1 4 1	£1 4 1	£0 18 7	£1 1 3	£0 19 3	£1 2 4	£0 19 10	£1 5 5	£0 19 1	£1 1 8	£1 4 4	£0 17 7	£1 2 7	£1 3 2	£0 16 11
Revenue																
Value of Gold produced	£270,884	£218,673	£202,096	£749,853	£99,841	£214,369	£188,088	£216,598	£102,152	£162,271	£756,436	£177,467	£106,620	£71,983	£221,287	£119,963
Value per Ton Milled	£1 8 4	£1 8 9	£2 1 6	£1 12 8	£1 8 7	£1 13 1	£1 12 6	£1 9 5	£1 10 7	£1 15 1	£1 12 1	£1 16 2	£1 0 1	£1 13 8	£1 10 6	£1 7 2
Working Profit																
Amount	£101,163	£40,232	£ 92,809	£323,675	£15,152	£102,167	£58,755	£70,343	£17,170	£74,084	£244,740	£58,086	£13,120	£23,683	£53,338	£45,330
Per Ton Milled	£0 10 7	£0 4 8	£1 0 5	£0 14 1	£0 4 4	£0 13 10	£0 10 2	£0 9 7	£0 5 2	£0 16 0	£0 10 5	£0 11 10	£0 2 6	£0 11 1	£0 7 4	£0 10 3
Other Sources																
Net Revenue or Expenditure—																
Debit	—	—	—	—	£844	—	—	—	—	—	—	—	£752	—	—	—
Credit	‡£25,563	*‡ £2,316	£555	*‡£12,306	—	*‡£41,644	* £2,005	‡£25,369	‡£3,620	‡£23,959	—	*‡£22,136	—	—	*£2,531	—
Net Profit	£126,726	£42,578	£93,364	£335,931	£11,308	£143,811	£60,760	£95,712	£20,790	£98,043	—	£80,522	£12,368	—	£55,869	—
Capital Expenditure	£3,241	† £6,795	*Credit* £1,025	† £71,027	£349	*Credit* † £10,026	† £9,500	† £11,278	£1,702	£10,601	£14,353	—	£22,292	£17,376	†£13,067	£1,916
Cash Position																
Financial Position, Cr. Balance ..	£81,051	£89,434	£18,636	—	—	£152,297	£74,075	£102,455	£46,516	£3,324	£321,598	—	—	—	—	—
Less Cash Assets (Stores, Live-stock, etc.)	£40,660	£67,997	£33,745	—	—	£73,300	£60,206	£50,362	£33,360	£54,941	£171,231	—	—	—	—	—
Balance Net Cash after allowing for Liabilities	£43,391	£21,437	—	—	—	£78,997	£13,869	£52,093	£13,156	—	£150,367	—	—	—	—	—
Financial Position, Dr. Balance ..	—	—	—	£299,297	£3,231	—	—	—	—	—	—	—	—	—	—	—
Add Cash Assets (Stores, Live-stock, etc.)	—	—	—	£450,828	£26,761	—	—	—	—	—	—	—	—	—	—	—
Balance Net Cash Liability ..	—	—	£15,109	£750,125	£29,992	—	—	—	—	£51,617	—	—	—	—	—	—
Interim Dividends Declared—																
Payable to Shareholders registered on books as at	—	—	Mar. 30, '12	—	—	—	—	—	—	—	—	—	—	—	Jan. 31, '12	—
Rate per cent.	—	—	20 per cent.	—	—	—	—	—	—	—	—	—	—	—	10 per cent.	—
Total amount of distribution ..	—	—	£182,000	—	—	—	—	—	—	—	—	—	—	—	£82,782 2s.	—

* Including Accumulations. † Exclusive of the proportion of an annuity payable to the Government in respect of mining rights acquired under certain claims. ‡ Including special declaration of Reserve Gold.

UNION MINING STATISTICS FOR MAY.

Gold, Silver and Coal Production—Development Returns—Accidents and Explosive Figures.

The following are the usual monthly returns, compiled and issued by the Government Mining Engineer's Department, of the prinicpal statistics relating to the mineral production of the Transvaal and the Union.

Total value of mineral output, gold, silver coal, and other metals and minerals, excluding diamonds, for May is £3,565,524.

THE GOLD PRODUCTION.

For May the Government returns of the gold output of the Transvaal record a total of 779,260.72 ozs. of fine gold, of a value of £3,310,088, the contribution from other Provinces being 251,972 ozs., value £1,070. It may be repeated for the benefit of students of statistics of the mining industry that the Government returns reflect gold actually produced during the month, and an explanation of some of the difference may be found in gold won not having been accounted for in the returns furnished by the companies to the Chamber of Mines in the month in which it was produced. The Government's return for the Witwatersrand is 747.193.756 ozs., value £3.173,878, against the Chamber's declaration of 746.948 ozs., value £3,172,833, which is less by 242 ozs., value £1,045, than the Government figures. For the outside districts the Government analysis gives 32,066.974 ozs., value £136,210, against the Chamber's figures of 32,714 ozs., value £138,961, the difference in this case being 647 ozs., value £2,751, less than the figures shown by the Chamber. The number of mines crushing on the Witwatersrand is given as 60, while the Chamber shows 58 companies making returns, besides gold recovered by miscellaneous producers. In the number of mines milling in respect of what are termed outside districts, the Chamber's analysis shows two mines producing gold at Heidelberg, four at Barberton, and two at Lydenburg, besides miscellaneous producers, while the Mines Department shows four for Heidelberg, four for Klerksdorp, one for Ottoshoop, thirteen for Barberton, twelve for Pilgrims Rest, and two at Pietersburg. The total number of all mines crushing is 98. Cape returned 2.4 ozs., value £10, from alluvial, and Natal returned 249.572 ozs., valued at £1.060, from one mine. In addition, there are 38 mines, works, and gold-producing concerns returning gold not included in the above total. The number of stamps dropping is given for the Rand at 9,475, for Heidelberg 130, for Klerksdorp 70, for Ottoshoop 10, for Barberton 270, for Pilgrims Rest 155, and for Pietersburg 15, making a total of 10.125. Natal worked five stamps. The number of tube mills operating on the Rand was 258. Heidelberg district 2, Klerksdorp district 2, Barberton 1, and Pilgrims Rest 5, the total for the Transvaal being 268. The summary of production for May is :—

	Ozs.	Value. £
Witwatersrand	717.193.756	3,173.873
Outside districts—		
Heidelberg	7,437.000	31,590
Klerksdorp	2,695.061	11,448
Ottoshoop.	101,780	432
Barberton.	7,261.146	30,813
Pilgrims Rest	14,163.347	60,161
Pietersburg...	408.640	1,736
	779,260.730	3.310,088
Cape...	2.400	10
Natal..	249.572	1.060
	779,512.702	3.311.158

In the detail of sorting the system of tabulation sets out that the producing mines on the Rand sorted out during May 13.18 per cent. of the tonnage mined as against 12.87 for April, March 12.88 per cent , February, 10.03 per cent., January 12.76 per cent., December, 1911, 12.32 per cent., November 12.65 per cent., 13.16 per cent. for October, 12.78 per cent. for September, 12.59 for August, 13.05 per cent. for June, 13.05 per cent. for May, 13.22 per cent. for April, 14.49 for March, 13.83 for February, and 13.66 for January. The tonnage milled on the Rand amounted to 2,187.788 tons, and for the whole of the Transvaal 2,265,027.

ROCK DRILLS.

The average number of machine drills in use in the gold mines during each month for the past thirteen months was :—1911, May, 4.201; June, 4,286; July, 4.329; August, 4,412; September, 4,417; October, 4,580; November, 4.653; December, 4,671; 1912, January, 4,791; February, 4,761; March, 4.689; April, 4,665; May, 4,951, of which 4,870 were on the Rand, 47 at Heidelberg, 16 at Klerksdorp, and 18 at Barberton.

DEVELOPMENT.

For all districts the figures for ore handled and treated during May were :—

	Rock Hoisted. Tons.	Rock Milled. Tons.
Witwatersrand	2,526,873	2,187,788
Heidelberg	22,237	19,626
Klerksdorp	12,376	10,412
Ottoshoop..	578	578
Barberton..	23,675	20,952
Pilgrims Rest	25.223	21,176
Pietersburg	1,571	1,495
	2,612,537	2,266,811

The number of feet driven on development on main drives and crosscuts was :—On the Rand 12,260, and in outside districts 10,793. On main shaft sinking on the Rand a total of 4,092 feet in depth was attained, and in outside districts 126 feet. Other development on the Rand accounted for 26,369 feet, and in outside districts 1,801 feet.

FINE SILVER DECLARED.

The returns of fine silver produced begin from the commencement of the statistical year, July 1, 1902. The declared weight and value are appended :—

	Ounces Fine Silver.	Value. £
Statistical year, 1902-3	280.997.219	29,215
Statistical year, 1903-4	406,676.911	45,111
Statistical year, 1904-5	476,085.975	54,221
Statistical year, 1905-6	574,485.878	70,704
Statistical year, 1906 7	690,731.853	92,874
Statistical year, 1908-9	798,316.556	84,686
Statistical year, 1909-10	801,657.721	85,807
June-December, 1910		55,650
Year 1911		98,507

1912—

	£
January	8,735
February	8,321
March	9,291
April	9.525
May.	9,719

COAL PRODUCTION.

The number of mines producing coal in the Transvaal is returned at 33. The quantity sold was 422,844 tons for the month, which shows an increase of 24,752 tons as compared with the previous month. The total value of the coal at the pit's mouth is given at £92,941, which is an increase of £1,023. The details of the production for May are :—

	No. of Collieries.	Tons sold.	Value. £	Value per ton. s.	d.
Springs.	5	51.944	14.743	5	4.4
Middelburg	15	327,997	70,711	4	3.74
Other districts	13	39,903	7,487	3	9.03
	33	422.844	92,941	4	4.75

The percentage of waste sorted out was 15.53.

UNION RETURNS.

	Coll.	Tons. sold.	Value. £	Value per Ton s.	d.
Transvaal..	33	422.844	92.941	4	4.75
Cape	8	6.715	3.920	11	8.1
O.F.S...	5	47,812	13.670	5	5.61
Natal...	19	251.293	72,316	5	9.07
Totals...	65	728.664	182,247		

COPPER.

The output of marketable produce for May was :—

	Tons.	Pure metal per cent.	Tons.	Value shipped.
Transvaal. ...	96.57	47.2	165,833	£5.844
Cape	1,287.00	50.52		
	1,383.57		165.833	£5,844

TIN.

The marketable output of tin for May was :—

	Tons.	Pure metal per cent.	Tons.	Value shipped.
Transvaal	261.136	66.42	340.816	£42,180

OTHER MINERALS.

Minerals other than gold, coal, copper, and tin for May :—

TRANSVAAL.

Mineral.	Tons.	Value.
Graphite...	3.455	£112
Magnesite.	—	—
Lead	66.6	678
Lime	5,670.000	9,806
Flint	188.000	1,211
Miscellaneous	33.000	180
	Ozs.	
Silver in gold bullion	82,355.501	£9,487
Silver in other minerals...	1,320.000	132

UNION OF SOUTH AFRICA.

Minerals.	Tons.	Value.
Asbestos	104.184	£1,554
Graphite	3.455	112
Magnesite...	—	—
Lead...	66.6	678
Lime..	6,086.000	10,741
Flint..	188.000	1,211
Miscellaneous	33.000	180

TOTAL MINERAL OUTPUT.

Gold, £3,311,158; silver, £9,619; coal, £182,217; base metals, £62,500; total, £3,565,524.

ACCIDENTS.

From the table of accidents the following extracts are reproduced, the total number of separate accidents for May being 218 for the Transvaal, and for the Union of South Africa 248.

EXPLOSIVES.

Appended is a summary of the statement showing the quantity of explosives manufactured during May :—Transvaal, 23,195 cases; Cape, 33,664 cases; Natal, 20,928 cases; total, 77,787 cases.

THE FUTURE OF TIN.

Tin Production Is Not Being Greatly Increased—Malaya and Bolivia—Some Comparative Statistics.

THE present high price of tin, combined with the favourable prospects with regard to the immediate future at any rate of the tin industry, make it a matter of importance to know how long existing conditions are likely to be maintained. The future of tin mining is uninfluenced by circumstances which are of considerable moment in connection with operations in copper. There is, for instance, no host of small mines just on the verge of payability which only await a rise in the price of the metal in order to flood the market with a rapid output; neither are there large accumulations of wrought metal which are destined to find their way back to the sale-rooms, there to compete with newly-produced ore in increasing quantities. In various ways the outlook for tin is impaired by fewer obstacles than is that of the sister metal, and it is interesting to learn that those whose business it is to study the future and who have means and opportunity for doing so are full of confidence with regard to it. Among these are Mr. Sydney Fawns, M.I.M.M., the author of the well-known book on "Tin Deposits," and who happens to be chairman of the Begel (Bauchi) Tin, Ltd., a Nigerian venture that has been floated to deal with an alluvial area on the Jarawa River. At the last annual meeting of the company, on the 22nd May, Mr. Fawns took occasion to refer to the subject under discussion, and his words are worth quoting for the benefit of those who are concerned as to the continuance of the existing conditon of things. Having referred to various matters relating to the operations of his company, he continued :—

THE GREAT PRODUCING CENTRES.

"Of course, the point which naturally affects the value of the mine is the present and probable market price for tin. The present price may seem exceptionally high to many people, and most probably to the purchasers of tin; but if all the points are considered, together with the statistics, it will be found that the great producing centres of tin are not increasing their outputs, and in the case of the Malay, Banka, Billiton, Singkep, which produce nearly two-thirds of the world's supply, its output is slowly decreasing. I had an opportunity of talking it over with Mr. Douglas Osborn, of the firm of Messrs. Osborn & Chappel, who knows more about Malay probably than any other person. It is his unhesitating opinion that the output there has reached its maximum. One of the other large producing centres of the world is Bolivia, and the gentleman in London who knows more about the output of tin in Bolivia—namely, Mr. Aramayo Francke—and who also controls a very large group of mines there tells me that the present output of tin there has reached its maximum, because transport facilities are now as perfect as can be expected, having four railways entering into Bolivia and being connected up by all important centres, and all the known tin deposits are being worked, with some of the finest and most modern tin dressing appliances in the world, which have recently been erected in Bolivia. It is quite a mistake to think that tin mining in Bolivia is in a backward condition. The other important centres, Cornwall and Australia, cannot possibly increase their present output. China, which produces about five times as much as Northern Nigeria, cannot increase. Therefore, the only country left is Africa."

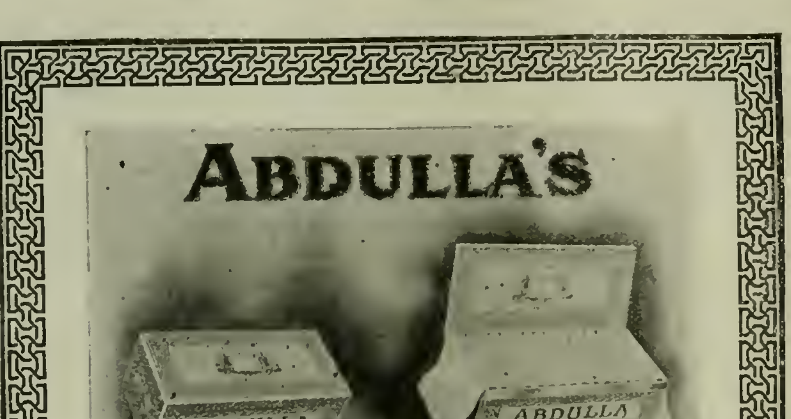
COMPARATIVE TIN PRODUCTION.

"The tin production of Malay Peninsula in 1910 was 56,115 tons, and in 1911, 57,049 tons; for Banka in 1910 it was 15,855 tons, and in 1911, 16,428 tons; for Billiton in 1910 it was 4,048 tons, and in 1911, 4,464 tons; for Singkep in 1910 it was 398 tons, in 1911, 461 tons. The total for 1911 was 78,402 tons. In Bolivia the output in 1910 was 23,129 tons, in Cornwall for the same year it was 7,572 tons, and in China 6,407 tons. The official returns for Northern Nigeria for 1911 give 1,378 tons. Assuming that the output of Northern Nigeria is doubled this year, and that within three or four years' time it is 8,000 tons per annum, that, in the opinion of people connected with the tin market intimately, will not materially affect the price. A word may be said here about the reported discovery of lodes in Northern Nigeria. The probability is that the majority of the tin in Northern Nigeria will be raised from alluvial for many years to come, but, with such a vast area it is impossible to say that there will not be tin lode mining centres there, although it must be borne in mind that the tin producing centres of Malay, Banka, Billiton and Singkep produce under 1 per cent. of their tin from any other deposits than alluvial, while the two great lode mining centres of the world, Cornwall and Bolivia, produce less than 1 per cent. of their output from alluvial. Therefore, the statement that is so often made by chairmen of various Nigerian companies, that because they have alluvial they must have lodes, is not borne out by fact. Although big lodes may not be found, what may probably be found to pay very well are the large dykes and stockwork formations, which very often are really the source of the alluvial and not lodes, and I have told Mr. Dunn, in our interest, especially to look out for this class of tin deposit. I may instance here the case of the Bruseh mine in Perak, which is one of the most successful of the hydraulic mines there, or in the world. They are really working a big pegmatite dyke *in situ*: the rock is first blasted and then sluiced down by means of hydraulic pressure, so that although this is a large dyke *in situ*, it is really worked as an alluvial hydraulic proposition."

PATENTS ADMINISTRATION IN THE UNION.

Important Recommendations by the Transvaal Chamber of Mines.—A Central Office for South Africa—Classification and Publication Questions—Lessons from Australia—Status of Agents—Compulsory Working.

In a memorandum on the questions raised by the Government in a circular letter, dated August 1st, 1911, from the Patents, Trade Marks, Copyright and Tacit Hypothecs Commission, the Transvaal Chamber of Mines makes the following representations:—These recommendations submitted on the various questions raised are confined entirely to the question of patents, and the Chamber has no recommendations to submit on the other matters referred to the Commission. *Question* 1 *of the circular letter of August* 1*st.*—"The desirability or otherwise of establishing a central office for the Union, where all applications would be received, all objections and oppositions dealt with, and all registrations finally effected." The Chamber is very strongly of opinion that there should be a central office for the Union, in accordance with the existing practice in all other countries, and that the office should be in Pretoria, the seat of the Administrative Capital, where all applications should be received and objections and oppositions dealt with and all registrations finally effected. *Question* 2.—"In case such an office is established, the question of how far and for what purposes the existing provincial offices should be retained." The Chamber recommends that the provincial offices be abolished, and that matters affecting existing and future applications be transferred to the central office. The Chamber also recommends that printed copies of current specifications, complete or abridged, be kept and be available in the libraries of the larger towns of the Union similarly, the Chamber understands, to the practice obtaining in Great Britain, and that when a subject matter index has been compiled copies of this might be available to the public in the libraries of the larger towns throughout the Union. The latter recommendations are more fully dealt with under Question 5. *Question* 3.—"The position of patents and trade marks already registered in the various Provinces: '(a) with regard to future protection; (b) with regard to extension throughout the Union; (c) with regard to their amendment or renewal if desired, either for the same Province or for the Union." In respect of this question and the previous two questions, the Chamber recommends that the precedent of the Australian Commonwealth be followed, and that provisions in principle similar to those contained in the Australian Patents Act, 1903, be adopted in the Union Patents Law. The provisons referred to are as follows:—*Saving of rights under State Acts.*—6. This Act shall not affect any proceedings pending under any State Patents Act nor any right or liability acquired or incurred before the commencement of this Act, and any pending proceedings may, subject to the provisions relating to the transfer of patent administration from the States to the Commonwealth, be continued and completed as if this Act had not been passed. *Extension of State Patents to the Commonwealth.*—(7. (1) The patentee under a State Patents Act of an invention whose patent is in force at the time of application, may make application under this Act for a patent for the invention. (2) The Commissioner may grant a patent under this Act for the invention, but if he is satisfied that the subject-matter of the patent under the State Patents Act (a) is not novel, or (b) has been published, or (c) has been made the subject of a pending application in any State other than the State in which the patent under the State Patents Act was granted, then any such State may be excepted from the patent granted under this Act. (3) Every patent granted under this section shall be for a period to be fixed by the Commissioner, not exceeding the unexpired period of the patent under the State Patents Act. (4) The patent under the State Patents Act shall continue in force notwithstanding the grant of a patent under this Act, but may be surrendered by the patentee. *No new application to be made under State Acts.*—8. After the administration of the State Patents Acts of any State has been transferred to the Commonwealth no application for a patent under such State Patents Acts shall be receivable except pursuant to some right previously acquired; but nothing in this Act shall prevent any person who has obtained protection in respect of an invention under a State Patents Act from applying for a patent for that invention under the State Patents Act. *Proclamation of transfer of administration.*—18. The Governor-General may by proclamation declare that on the date specified in the proclamation the administration of the State Patents Acts of any State shall be transferred to the Commonwealth. *Effect of transfer of administration.*—19. On the date so specified: (a) The State Patents Acts of the State referred to shall so far as they have any relation to patents cease to be administered by the State, and the Commonwealth shall thereafter administer the same so far as it necessary for the purpose of completing then pending proceedings and of giving effect to then existing rights, and the Commissioner shall collect for each State the fees to which it may become entitled pursuant to such administration. (b) All powers and functions vested under any State Patents Act in the State or in the Governor thereof or in the Governor with the advice of the Executive Council thereof, or in any Minister, officer or authority thereof shall vest in the Governor-General or in the Governor-General-in-Council or in the Minister, officer or authority exercising similar powers or functions under the Comomnwealth as the case requires or as is prescribed. (c) All records, registers, deeds and documents with appertaining models and incidentals of the Patent Department of any State vested in or subject to the control of the State shall be vested in and made subject to the control of the Comonwealth. *Extent of Patent*, 46 *and* 47 *Vic., c.* 57, 16.—63. Every patent when sealed shall have effect throughout the Commonwealth, unless any State shall be excepted therefrom, in which case it shall not apply to such excepted State. As regards the adoption of the provisions of these sections in a South African law, the Chamber recommends the following modifications:—*Section* (7). As regards this section, the condition (a), (b) and (c) laid down in sub-section (2) in the opinion of the Chamber require modification for a South African Patent Law. The principle that the Chamber recommends should be adopted in any section extending provincial patents to the Union is that no extension should be granted to any other Province in which prior to a Union Patent Act the patentee would have been unable to obtain a patent for his invention. The conditions (a), (b) and (c) of the above sub-section in certain cases would enable a patentee to have his patent extended to the Province of the Transvaal, for instance, although under the Transvaal Patent Law he would not have been entitled to any such right. As regards sub-section (3) of this section, the Chamber is of opinion that every patent granted under a section of this nature should be for the unexpired period of the patent under the Provincial Patents Act, and that it should not be within the discretion of any Commissioner to restrict such period. The Chamber further recommends that every patent granted under this section should recite the fact that it is an extension of a Provincial patent, and should also state whether or not the Provincial patent has been surrendered, and the Chamber recommends in the event of the Provincial patent not being surrendered, that such patent should be endorsed to the effect that a Union patent has been granted in respect of the same invention. As regards section 19, sub-section (a) the only modification that the Chamber has to offer is that the words "and the Commissioner shall collect for each State the fees to which it may become entitled pursuant to such administration" are unnecessary. Subject to the recommendations put forward above on the sections quoted from the Patents Act, 1903, of the Comonwealth of Australia, the Chamber recommends that similar provisons to those contained in these sections be adopted in the Union Patent Law. *Question* (4).—" The practice and procedure with regard to application for registration and oppositions thereto." The Chamber recommends that the provisions of the Transvaal Patents Proclamation 1902 (Transvaal Proclamation No. 22 of 1902) as amended by the Patents (Amendment) Proclamation, 1902 (Transvaal Proclamation No. 29 of 1902) with regard to the procedure and practice affecting applications, registrations and oppositions be adopted in a Union Patent Act. The Chamber strongly urges that in the absence of examination of applications for patent rights conducted in the most elaborate manner that it would be a retrogade step to limit in any way the grounds of opposition allowed by the Transvaal law, which entitled any person to oppose the grant of a patent on any ground which would afford a valid defence to an infringement action. *Question* (5).—" With special reference to patents, the extent to which expert investigation of all applications should be departmentally undertaken; and the facilities and grounds which should be allowed for objections." The Chamber is of opinion that it is highly desirable that as far as possible patents should only be granted for inventions which are legally patentable. As contributing to this result the following means would appear to be available: (1) Facilities for rendering existing knowledge accessible. (2) Checks upon the issue of invalid patents. The Chamber proposes to discuss question (5), and to submit its recommendations under the above two headings. (1) *Facilities for rendering existing knowledge accessible.* (a) *Classification of Patents.* The Chamber is of opinion that this is a feature of the administration of a Union Patent Office which most calls for attention. A careful classification on the British model of the published specifications of all the Provinces should be taken in hand at once. The Chamber feels that this work is essential as a foundation of any future patent development of the country, and in particular of any system of examination. It is of opinion that the importance of the work would well repay the employment of technical experts in their particular lines. The Chamber is of opinion that a Commissioner such as is proposed by the Chamber later on in its recommendations on this question, a chief examiner and one or two capable assistants would be a sufficient staff for this work, to commence with. (b) *Printing of Specifications.* The Chamber is of opinion that the time has arrived when it is essential that complete specifications, which have been accepted and consequently open to public inspection, should be available in printed form. The Chamber recognises, however, that this might be a somewhat expensive matter, but it strongly urges that the Union Patent Office should as a minimum compile and print abridgments of such specifications, the printing of which would cost but little, and the abridgments could be distributed and kept at the public libraries in the more important towns throughout the Union. (c) *Library.* The desirability of an extensive technical library is obvious, but in order fully to develop its usefulness for patent purposes a careful subject matter index is necessary. The Chamber realises that an adequate technical library is a matter of considerable expenditure. It does, however, strongly urge that the facilities for rendering existing knowledge accessible recomended in (a) and (b) be inaugurated at once. It also recognises that if the establishment of a complete technical library at the present time be impracticable on the grounds of expense convenience should be made at once toward the attainment of this end, and the nucleus of a library thus established be added to from year to year. (2) *Checks upon the issue of invalid patents.* (a) *Official examination.* The Chamber is of opinion that this is the most satisfactory method of checking the issue of invalid patents. It feels that to recommend the system of examination such as obtains in the United States and Germany is not justified on the ground of expense or having regard to the existing development in the country of patent work. The Chamber, however, is of opinion that a search restricted to South African patents should be instituted as soon as a thorough clasification of the published specifications of all Provinces has been completed. The technical gentlemen who would be required for drawing up a classification index might be retained for the examination of specifications. This matter of official search is not one of immediate moment as a classification of accepted specifications would probably take some time to compile, but the Chamber is of opinion that provision should be made in a Union Patent Law for such official examination, the provision to come into force on a date to be fixed by the Government. The Chamber strongly recognises that such date should not be later than may be required to complete the classifications of existing patents. (b) *Grounds of Objection.* The system of official examination recommended by the Chamber, though of increasing value from year to year, would not be of such an elaborate nature as to warrant any alteration in the hitherto existing grounds of opposition under the Transvaal Patent Laws, and the Chamber most strongly urges that the existing Transvaal grounds of opposition be retained in any Union Patent Law. It is further of opinion that oppositions should be heard by a Commissioner, with high legal and scientific attainments. The appointment of such an officer appears to the Committee fully justified by the scope of the work necessitated by one Patent Office for the Union, and it is of opinion that such an appointment would inspire confidence and give encouragement to all inventors. It recommends that appeals from such Commissioner in respect of opposition proceedings should be permitted to the Appellate Court



of South Africa direct. The Chamber is aware that its recommendations made under this question (question 5) generally may involve increased expenditure. It is of opinion, however, that the revenue that may be expected to be derived from patents under a Union law will go far to inaugurate the maximum reforms put forward. The Chamber is of opinion that a patent office should not be considered from the point of view of a revenue-producing concern, and that although the direct revenue derived from patents might be insufficient, it must be remembered that the principal benefit to the State from patent development is an indirect one, *e.g.*, if by the work of inventors the profits of the gold mining industry are increased 1d. per ton the revenue of South Africa is receiving one-tenth of that 1d. in profits tax. On a basis of 24,000,000 tons crushed annually, this means an annual increase of revenue of £10,000. This argument applies to all mines, and with particular force to diamond mines, in which the Government participates in profits in certain cases to the extent of 60 per cent. The Chamber feels therefore that to encourage the inventor would well repay this country in particular, even if the outlay at first could not be met by the revenue directly derived from patents. *Question* (6)—" In what respect the existing laws in your Province may have been found in working to be unnecessarily expensive or unsatisfactory." As regards the question of expense the Chamber is of opinion that the working of the existing laws shows no signs of being unnecessarily expensive, and in view of its recommendation that a Commissioner be appointed, and that the practice obtaining under the Patent Proclamations of 1902 of the Transvaal be reverted to, it desires to state its opinion that oppositions before the Commissioner, if anything, are less expensive than the High Court proceedings at present in force under Act No. 28 of 1907 of the Transvaal. On the question of the unsatisfactoriness of the existing law the Chamber recommends: (a) *Definition of Patentable Invention.* That this definition contained in section 5 of Proclamation No. 22 of 1902, as amended by section 1 of Proclamation No. 29 of 1902 be adopted in the Union Patent Law. The Chamber, however, would like to point out that the words " and not in public use or on sale in this Colony or any foreign country for more than two years prior to such application unless the same is proved to have been abandoned " render the definition ambiguous. The Chamber is of opinion that they might be deleted. (b) *Innocent Infringers.* The Chamber recommends that a section in favour of innocent infringers similar to section 33 of the English Patents and Designs Act, 1907, be adopted in the Union Patent Act. (c) *Compulsory Working.* On the question of compulsory working, the Chamber recommends that section 29 of Transvaal Proclamation No. 22 of 1902 be adopted in the Union Patent Law, with the substitution of the word " Commissioner " for " Governor " wherever the latter word appears, and with the substitution of the word " invention " for the word " patent " in condition (a) of that section.

ANNEXURE " A."

Status of Patent Agents. (1 There shall be a register of patent agents for the Union (*vide* Australian rule 134). (2) No person shall practise or act at a patent agent in the Union unless he is registered as a patent agent in the Union register, or is a solicitor, and no person shall describe himself as a patent agent unless he is so registered (*vide* Australian Act 106-7). (3) Any person who at the commencement of the Act was duly registered in a Provincial official register of patent agents shall be entitled to have his name entered in the Union register, without examination or fee. (4) Any person who proves that at the commencement of the Act and for twelve months prior thereto he had been bona-fide practising as a patent agent in any Province in which there was no provision for registration of patent agents shall be entitled to be registered as a patent agent upon payment of a fee and without examination, but shall not, unless he be a solicitor, be entitled to practise as a patent agent in any Province which before the comencement of the Act provided for registration of patent agents. (5) No person other than those mentioned in (3) and (4) shall be registered except after passing the prescribed qualifying examination, which should be established in a standard not less than that of the present Transvaal examination. (6) No distinction should be drawn between solicitors and patent agents, as regards their right to conduct opposition proceedings before the Commissioner, or their costs in the same.

Why Rand Shares are out of Favour.

A VALUABLE TRUTH CONVEYED IN HUMOROUS GUISE BY A *PUNCH* ARTICLE—NO ATTRACTION FOR PEOPLE WHO WANT A "FLUTTER IN MINES."

In the last issue of *Punch* appears an amusing story of a speculation in mines, which in the opinion of many is a striking illustration of a " true word spoken in jest " : The shares—they were in the Jaguar Mine—were bought for the excitement of " watching them go up and down." The solicitor advised a safe five per cent. mortgage, but " you couldn't possibly watch a safe mortgage go up and down," so Henry was consulted. " In the intervals between golf and golf Henry dabbles in finance. ' You don't want anything gilt-edged, I gather?' he said. It's wonderful how they talk.

" ' I want it to go up and down,' I explained patiently, and I indicated the required movement with my umbrella.

" ' What about a little flutter in oil?' he went on, just like a financier in a novel.

" ' I'll have a little flutter in rasoberry jam, if you like. Anything as long as I can rush every night for the last edition of the evening papers and say now and then, " Good heavens, I'm ruined." '

" ' Then you'd better try a gold mine,' said Henry bitterly, in th voice of one who has tried. ' Take your choice,' and he threw the paper over to me."

The tragic story continues :—" My first two months as a magnate were a great success. With my heart in my mouth I would tear open the financial editions of the evening papers, to find one day that Jaguars had snared like a rocket to 1 1-16, the next day that they had dropped to 1 1-32. There was one terrible afternoon when for some reason which will never be properly explained we sank to 15-16. I think the European situation had something to do with it, though this naturally is not admitted. Lord Rothschild, I fancy, suddenly threw all his Jaguars on the market; he sold and sold and sold, and only held his hand when, in desperation, the Tsar granted the concession for his new Southend to Siberia railway. Something like that.

" But lately things have not been going well. At the beginning of April Jaguars settled down at 1 1-16. Though I stood for hours at the club tape, my hair standing up on end and my eye-balls starting from their sockets, Jaguars still came through steadily at 1 1-16. To give them a chance of doing something I left them alone for a whole week—with what agony you can imagine. Then I looked again; a whole week and anything might have happened. Pauper or millionaire?—No, still 1 1-16.

"And now what I dreaded most of all has happened. I have received a ' Progress report ' from the mine. It gives the ' total footage ' for the month, special reference being made to 'crosscutting, winzing and sinking.' The amount of 'tons crushed' is announced. There is serious talk of ' ore ' being ' extracted ' ; indeed, there has already been a most alarming 'yield in fine gold.' In short, it can no longer be hushed up that the property may at any moment be 'placed on a dividend-paying basis.' Probably I shall be getting a safe 5 per cent."

ROBESON-DAVIDSON PATENT CENTRIFUGAL PUMPS

For Pumping Sands and Slimes.

Minimum Maintenance Costs, Highest Efficiency, Unrivalled Accessibility to all parts and Flexibility in raising tailings to any height.

The Pump that Supplanted the Tailings Wheel.

Further particulars from the Licensees:—
FRASER & CHALMERS, LTD., Johannesburg.
TARRY & COMPANY, LTD., Johannesburg.
ROWE & JEWELL, Johannesburg.
WRIGHT, BOAG & CO., Johannesburg.

Patented Transvaal., Gt. Britain, Australia, United States of America, &c.

DIVIDENDS DECLARED BY RAND GOLD MINES, 1887–1911.

A Striking Summary of the Eighty Millions of Profits Distributed by the Industry in Twenty-four Years.

The following list, compiled by the Chamber of Mines, gives a striking summary of the profits distributed by the Rand since 1887 :—

Company.	No. of Last Dividend.	Total Rate per Cent.	Total Amount of Distribution.
Angelo	13	333¾	£1,231,648
Aurora	3	35	18,250
Block "B" Langlaagte—			
Preference	16	128	112,200
Ordinary	2	12½	68,750
Bonanza	16	662½	1,325,000
Cason	3	93¾	492,188
Champ d'Or	11	167⅔	219,196
Chimes	2	10	4,000
City and Suburban ...	24	398¾	2,159,913
Consolidated Deep Levels	6	160	299,600
Consolidated Main Reef	7	37½	322,781
Crown Mines	*21	*957½	*4.760,812
Crown Reef	40	2,404	2,867,900
Driefontein Consolidated	11	195	741,111
Durban Roodepoort ...	75	1,075	1,322,583
Durban Roodepoort Deep	5	32½	143,000
East Anglian	3	230	64,400
E.R.P. Mines	‡7	‡130	‡3,043,664
Evelyn	1	10	2,600
Ferreira	36	4,415	3,919,250
Ferreira Deep	17	327½	2,980,250
French Rand	2	12½	64,250
Geldenhuis Deep	24	562½	1,881,990
Geldenhuis Estate ...	30	835	1,640,750
Geldenhuis Main Reef	4	30	45,000
Ginsberg	17	262½	477,375
Glen Deep	10	85	510,000
Glencairn	14	107½	448,750
Golden Kopje	2	7½	5,625
Grahamstown	1	10	1,650
Henry Nourse	12	590	737,500
Heriot	3	15	8,996
Johannesburg Pioneer ...	30	2,107½	442,575
Jubilee	80	1,215	495,479
Jumpers	26	590	576,500
Jumpers Deep	7	57½	301,240
Jupiter	1	5	50,710
Knight Central	1	5	45,000
Knights Deep	13	165	1,061,817
Lancaster	2	20	65,105
Lancaster West	1	10	19,500
Langlaagte Deep ...	4	35 5-6	286,666
Langlaagte Estate ...	43	494	2,543,580
Langlaagte Royal ...	8	40	26,500
Luipaard's Vlei	3	15	59,760
Main Reef West ...	5	55	250,589
May Consolidated ...	27	487½	1,399,100
Meyer and Charlton ...	44	1,045	1.035,308
Meyer and Leech ...	4	27½	4,075
Moss Rose	4	20	7,141
Moss Rose Extension ...	1	4	3,200
New Aurora West ...	3	15	10,000
New Chimes	13	115	95,049
New Comet	5	52½	203,125
New Croesus	2	10	7,500
New Goch	5	37½	206,250
New Heriot	35	912½	1,000,287
New Kleinfontein ...	15	162½	1,226,125
New Modderfontein ...	11	82½	1,072,500
New Primrose	37	762½	2,277,525
New Rietfontein ...	11	135	711,093
New Unified	7	60	150,000
North Randfontein ...	4	40	180,000
Nourse Mines	*14	167½	1,104,939
Orion	14	132½	65,750
Paarl Pretoria	1	25	18,750
Percy	2	20	2,000
Porges Randfontein ...	7	70	342,500
Princess Estate	8	72½	184,627
Randfontein South ...	3	25	500,000
Rietfontein "A" ...	7	70	237,688
Robinson	39	326	8,955,938
Robinson Central Deep	9	337½	1,485,000
Robinson Deep	18	315	2,950,186
Robinson Randfontein ...	3	30	180,000
Roodepoort United ...	21	285	609,500
Rose Deep	21	382½	1,913,125
Royal	2	17½	3,500
Salisbury	32	405	248,823
Simmer and Jack Pro.	19	287½	4,116,461
South Randfontein ...	5	50	225,000
Stanhope	21	327½	109,670
Treasury	12	163⅛	469,025
Van Ryn	16	282½	1,344,500
Village Deep	7	45	477,303
Village Main	22	590	2,581,543
Vogelstruis Estates ...	4	20	44,996
Vogelstruisfontein ...	3	15	6,750
Wemmer	27	1,237	871,180
West Rand Central ...	3	17½	15,477
West Rand Consolidated	1	3¾	74,228
Windsor	1	20	20,000
Witwatersrand	15	242½	1,000,625
Witwatersrand Deep ...	12	285	1,495,093
Wolhuter	8	60	443,000
Worcester Exploration*	37	412½	338,037
Worcester Exploration†	37	412½	338,037
York	6	80	29,600
Total	—	—	80,199,095

* Including Crown Deep. ‡ Since Amalgamation in 1908.

* Including Nourse Deep.
† See also Outside Districts.

DIVIDENDS DECLARED OUTSIDE DISTRICTS GOLD MINES, 1887-1911.

Company.	No. of Last Dividend.	Total Rate per Cent.	Total Amount of Distribution.
Barrett	3	14⅙	£8,500
Birthday (Klein Letaba)	4	15	22,150
Glynn's Lydenburg ...	20	240	403,366
New Clewer Estate ...	1	5	5,000
Nigel	31	397½	780,899
Sheba	21	96¼	747,220
Transvaal Gold Exploration and Land Co.	—	57½	191,969
Transvaal G.M. Estates..	11	125	755,280
United Ivy	4	25	12,350
Worcester Exploration	6	47½	45,467
Total	—	—	2,972,201

* See also Witwatersrand.

NOTE.—The total rate per cent. shown in the foregoing tables is the sum of the rates at which the various dividends have been declared, and is not necessarily a total rate per cent. corresponding to the total sum distributed and the *present* Capital.

Van Ryn Gold Mines.

The board of directors have declared a dividend (No. 17) of 22½ per cent. (or 4s. 6d. per share), less income-tax, making, together with the dividend of 22½ per cent. paid in January last, a total of 45 per cent. for the financial year ending June 30, 1912.

The Crown Colliery, on the borders of the Newcastle town lands, is to be reopened.

Situations Wanted.

ASSAYER seeks situation on Gold Mine, outside district; also experienced in amalgamating, cyaniding, smelting and general mill work, etc.

Apply, "ASSAYER,"
c/o this office.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Fatalities on the Mines of the Rand.

FALLACIOUS BASIS OF RECENT COMPARISONS EXPOSED.

To the Editor, *South African Mining Journal.*

Sir,—In January last Mr. J. K. Leyds, Librarian to the Mines Department, published a table comparing the fatal mine accident rates of various countries. I pointed out at the time that these rates were not comparable, and that the table was liable to mislead both the public and the Government. I can hardly think that the Mines Department will thank your anonymous correspondent "Veritas" for the manner in which he attempts to justify Mr. Leyds' compilation. "Veritas" alleges that in the returns of "the Panama Canal Co.," "deaths from tropical diseases are classed with 'accidents.'" The Panama Canal Co. went into liquidation in 1904. The official returns published monthly by the United States Government of the deaths among workers on the Panama Canal do not class deaths from tropical diseases with accidents. Further, "Veritas" writes: "Well, I am surprised, not at the large percentage in the Transvaal, but at the fact that fatal mining accidents are not more numerous here, as the workmen are for the greater part raw natives, i.e., unskilled, untrained and clumsy workmen, whilst the white workmen are also known to be rather careless. It is, in my opinion, a miracle that there are still countries or mining districts with a larger percentage than the Transvaal or Rand." That is mere assumption and is of value only as proving that it would be practically impossible for "Veritas," with such a biassed frame of mind, to make an exact and impartial analysis of the facts required in compiling a table comparing the accident rates of various countries. I think a very useful purpose would be served were Mr. Leyds or some other official of the Mines Department to prepare and publish a statement showing as regards the countries mentioned in his table:—(1) The definition of fatal accidents; (2) the obligation of employers to supply information to the authorities; (3) the exact character of such information and how often it is supplied; (4) the basis on which accident death rates are calculated; (5) the provisions for the official inspection of mines and for enquiring into the causes of accidents. Such a statement would show the wholly unreliable character of most of the official figures which Mr. Leyds embodied in his compilation. It would be found that in some of the countries mentioned:—(a) Death is not attributable to accident unless the victim dies on the spot; (b) deaths resulting indirectly from accidents (such as deaths from blood-poisoning) are not attributed to accidents in the official returns; (c) mines are rarely if ever inspected by Government officials; (d) accidents are not officially investigated on the mines; (e) the figures for isolated mines are simply guesses; (f) no returns of the average number of employees are ever made, excepting at the time the Census is taken, say, once in ten years; (g) accident mortality rates are calculated on the total number of workers registered on the books without regard to the length of their services. (Such a basis would immediately reduce the Rand accident rate by more than 50 per cent.) In Mr. Leyds' table the average accident death rates of the coal mines of the world are given as:—1907, 2·40 per thousand; 1908, 2·13 per thousand; 1909, 2·11 per thousand. It would be interesting to know how figures, worked with such apparent accuracy to the second place of decimals, have been arrived at? All the authorities I have seen consider that even the United States figures, which Mr. Leyds also gives to the second place of decimals, are nothing better than crude statistical approximations, useful only—and that to a limited extent—for comparing one year with another in the United States, but absolutely worthless for the purpose of comparing the United States' rates with those of other countries. I believe that the figure 3·42 given by Mr. Leyds and in official publications as the accident death rate of the mines of the United States for 1908 has been proved to be wrong. Mr. L. G. Campbell of the Chicago University, in a book on "Industrial Accidents and their Compensation," published last year by Messrs. Constable & Co., writes:—"Figures sufficiently complete to show the number of accidents to working men in American industry are not obtainable. No compilation is made by the federal bureau of labour, and the labour bureaus of but few of the States attempt to gather full information. Even in these States, the provisions of the law are inadequate to enforce the reporting of accidents by employers, and facilities for the gathering of data by factory inspectors are usually lacking."—Yours, etc.,

SAMUEL EVANS.

79, Nugget Street,
Johannesburg, 27th June, 1912.

Stope Timbering.

To the Editor, *South African Mining Journal.*

Sir,—Would it surprise the author of "Notes on Stope Timbering" to learn that there are several ways of "putting in sticks," and all of them right under certain conditions? Why it should be "preferable" to put wedges in the foot, where they will certainly rot much quicker than in the head, I can't think. Why wedges should be advocated at all, it is hard to say. As putty covers up the carpenter's bad joints, so wedges are used to cover up the timberman's bad work. Would it surprise the author to learn that a stick bevelled at the bottom and put into a hitch properly shaped to support the stick at the bevel, is stronger than a stick which is not "chopped at the foot," because though it loses in diameter it is not nearly so liable to split when the weight come on. Hence the old Cornish saying: "Let the stick well fill the hitch." The author's dogmatic statements, such as "This angle is called the underlie," smacks of the class room. Speak to nineteen out of twenty good timbermen of the underlie, and without further explanation they would not know what you meant. Anyhow, there is no reason why it should not be called the underlie, and there can be no earthly reason why it should be called the underlie. It would be extremely difficult to imagine a more inappropriate term for it. To show the chaotic condition of mining nomenclature on the Rand, a Cornishman would understand you better if you told him to "putun lookun too 'ee a bit."—Yours, etc.,

A. WILKES.

Johannesburg, 24th June, 1912.

Council of the Chemical, Metallurgical and Mining Society.

To the Editor, *South African Mining Journal.*

Sir,—The cry at the annual dinners of our technical societies is for more papers. A common complaint by authors who do read papers before different societies is the meagreness of the discussion and lack of interest shown by members on important subjects. What is being done to induce members to take a greater interest in the Societies' discussions, and thus become active members? From thirty-four or so names nominated for the Council of the Chemical, Metallurgical and Mining Society for the ensuing year I find several on the list of members who not only rarely attend the meetings, but have not contributed a single word to the Society's published transactions. The qualifications for such a position as a member of council of this established society of world-wide repute ought to be the active interest shown for the past twelve months; otherwise it is difficult to see what stimulus can be given the Society's technical work by the appointment to the Council of dumb members. The holding of a responsible position is in itself no logical qualification for the appointment to officership of this Society, and it is to be hoped that the Board to be appointed will bear this in mind for the future. —Yours, etc.,

MEMBER.

21st June, 1912.

[It seems to us that our correspondent's criticism is far less justified in the case of the C. M. and M. Society than in that of any of the other Rand scientific societies.—Ed.]

"Manufactured Rubies."

To the Editor, *South African Mining Journal.*

Sir,—In your issue of Saturday, 8th June, 1912, on page 554, I find something about "Manufactured Rubies." Could you please let me have Professor Silvanus Thompson's address if possible; also I should be exceedingly thankful if you could let me have the letter of the professor to *The Times.* A copy of *The Times* is very likely still to be had at your end. Hoping I am not bothering you too much.—Yours, etc.,

C. JANSEN WEILBACH.

P.O. Box 87, Lydenburg,
June 12, 1912.

[We regret that the articles in question are not available, but some of our readers may perhaps be able to supply them. —Ed. *S.A.M.J.*]

South African Land Values League.

To the Editor, *South African Mining Journal.*

Sir,—I am sending you, under separate cover, several pamphlets (English and Dutch) issued by the above League. In view of the importance, both socially and economically, of the reform we advocate, I trust you will see your way to deal with these pamphlets in your paper, and, if possible, print any or all of them. When further leaflets are printed by the League they will be sent to you. I shall be glad to receive a copy of your paper when you deal with the subject of rating or taxing land values. Any information you require on the subject will be furnished by the League with pleasure. I shall be glad if you will inform your readers of the existence of the League, and that they can, on application to me, obtain, free of charge, literature and information on the subject of land values taxation.—I am, etc.,

F. A. W. LUCAS,
Hon. Secretary.

Office: 57, Sauer's Buildings,
Johannesburg,
June 25th, 1912.

Rand Geology.

To the Editor, *South African Mining Journal.*

Sir,—In your footnote to my letter, which you kndly published in your last issue, you say that the Geological Society and "all who have made a study of the question in the field" are unanimous, we think, in accepting the identity of Lydenburg and Black Reef dolomites, and that it would be astonishing if they were not. Without wishing to appear captious, I cannot help feeling hurt at the remark, as it leaves the impression on the minds of your readers who do not know me that I have not studied the question in the "veld," but started a theory of my own on hearsay evidence, as many have done. Kindly allow me to state that I first made the acquaintance of the auriferous, argentiferous, cupiferous, zinciferous, and leadiferous dolomites of the Lydenburg age in the early part of 1877, during a prospecting trip to that district from Barberton, via the Shute, the Devil's Kantoor, Elands Valley, Spitzkop, Pilgrims, etc.—foot-slogging and donkey-thumping all the way there and back. Since then I have traversed and studied the age in many hundreds of places all over the country, and especially between here and Pretoria, Rustenburg, and Zeerust, where it is now marked on the Survey maps as Black Reef series and Pretoria series: which, being interpreted, means a bit of one age and a bit of the other joined together by "mere man." "Black Reef dolomites," all trippers to Klerksdorp in the early days have cause to remember, as the coach used to traverse the best part of the Black Reef age twice during the journey, and mercilessly rattled their bones over the stones—which were the dolomites—on approaching Buffles, and back again. If any geologist has ever found auriferous quartz reefs, etc., as aforementioned, in the dolomites aforesaid, apart from, or together with, any other evidence which can possibly identify them with those of Lydenburg, he deserves a knighthood. In spite of what any geologist may have said, or may say, I maintain that all the reefs at present being worked on Randfontien are of the Black Reef series—no matter how it got there, or how broken. *My* Main Reef series, which is Nature's—remains partially concealed away down on Princeloo's Rietvlei No. 113, patiently waiting for the Geological Survey to come and recognise it, when they have quite finished trying to trace its illusive trail on Randfontein.—I am, etc.,

SCOTT ALEXANDER.
Rand Stratigraphist

Johannesburg, June 28.

Native Disease in the Mines.

An article by Dr. B. G. Brock, which appears in the "Lancet," contains an authoritative "report on an inquiry into the prevalence of syphilis in the South African native, and its influence in aiding the spread of tuberculosis." Dr. Brock, who writes from Germiston, says in conclusion: "The probability of the importance of syphilitic lung as a cause of phthisis in natives working on the Rand is greatly increased when the usually accepted cause is subjected to examination. The term 'miner's phthisis' has been so long associated with the inhalation of dust of an irritating or otherwise harmful nature as its cause, that dust, by common consent, has long been given the place of honour as a cause of the disease. It is, therefore, of importance to inquire whether dust, as such, has any good claim to the place it holds as a causative agent of this disease, and if it has, what may be the reasonable limit of this claim? Comparing the death rate from phthisis, including miner's phthisis, in the male population of the Transvaal over 20 years of age with that of miners for the years 1905-07 these seem to be as 1 to 6, while those for Western Australia, where the mines are of a similar type, appear to be compared with the whole male population over 15 years of age, as 1 to 2, a difference that cannot be explained by the absence of dust, and it does not appear that it can be due to the quality of the dust. There would seem to be some special influence at work in producing such unfavourable mortality rates. . . . . In regard to steel-grinders Dr. Barnes (Sheffield) holds that the disease met with in them is tuberculosis, and he believes that dust, although no doubt preparing the lungs as a good nidus, is not to be considered of much account." He adds: "Quartz dust (the dust of Australian mines is of this type) examined under the microscope with a moderately high power presents an appearance that may be compared in miniature to a mixture of old nails, staples, tacks, broken needles, and here and there a fish-bone, an appearance that might excuse the belief that it would play havoc with the lung: yet life is reduced but three and a half years under its baneful influence. Dust of the Witwatersrand mines examined under the same power presents (as might be expected from its history) a field of smooth, rounded, waterworn particles, to all appearance quite innocuous, yet it is credited with killing in from five to six years. It is conceivable, then, that dust, as such, can be the essential factor in compassing such a result? . . . . Its influence in the production of the 'miner's phthisis' in the native, as known on the Rand, must at most be a speculative one of little or no value. The importance of the already syphilis-injured lung as a reasonable explanation of the cause of the great prevalence of, and high mortality from, both tuberculosis and pneumonia is greatly enhanced by these facts. The type of the former disease, too, strongly favours this view, removes it from the list of merely probable causes, and places it from the list of merely probable causes, and places it in the first rank as a determining cause of pulmonary tuberculosis in the native."

High Mining Salaries

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Rhodesian Section.

PROGRESS IN THE BEMBESI MINING DISTRICT.

Position at the Lonely, Elumba, Jumpers, and Various Small Ventures—B.S.A. Mining Co. Criticised—Need for Settled Financial Conditions.

[By a Special Correspondent.]

The Lonely.

Five short years! It seems but yesterday since I first visited the Lonely mine. Then 'twas a tiny spot in the great industry being built up by Rhodesians—but an infinitesimal, insignificant factor in the prosperity of Rhodesia. From Bulawayo there was a thirty mile run over the old type of Rhodesian roads—a type that is fast dying out. The way was only defined by a great many toll-stamps, a little more sand than the rest of the country, or in the wet season by a well-defined quagmire. Then came the Queen's Mine and then the Elumba, the first really successful independent venture, in Bembesi, then a devious course through heavy timber, without a sight of a white face, to the spot eighteen miles off, where three men were laying the foundation of a huge fortune. And at the end of the journey, what was there to look at? Two or three mud huts, a windlass or two hauling from the prospecting shafts, and a toy mill (3-stamp 250), which would tickle a Rand battery manager to death. All this was situated in a little clearing cut out of an almost primæval forest. Yet out of these small beginnings has been created one of the greatest of the world's mines. To-day the patter of the 3-stamp "dolly" is replaced by the roar of the great 1,300lb. stamps and their auxiliaries; the silent forest has become a veritable hive of industry, and is rapidly thinning away to the axes of the wood parties, and is an almost essential factor in the working of the property. A transformation indeed! How favoured a country possessing mineral wealth. Directly, the Lonely gives employment to some fifty white men, and probably 500 natives, but the indirect commerce which it stimulates is almost impossible to estimate. Storemen on the property and in town, wood contractors, and an endless array of trades indirectly affected, would probably bring the number up well within the region of another fifty.

The Lonely Mine is, without doubt, Bembesi's most successful mine, and has justified the confidence of the company promoters who put it on the market at so high a figure. At the present rate of output its annual production will exceed £180,000, and there is good reason to anticipate that the outputs will be well maintained, if not raised. The estimated profit in sight is greater than the entire capital of the company, and in view of the past maintenance of high values on each successive level, there is every reason to anticipate that very many years will elapse before the property will conclude its successful career.

The three-way main shaft is now down to the 1,000 ft. level, and development is being pushed ahead with all speed, both with machines and hammers. An unusual feature of the reef is that even at this depth the ore is oxidised. The upper part of the shaft is timbered with native wood cut in the saw bench, this working having been done before the company actually took over, but I understand that imported timber is now being used. A great portion of the work is now being done by contract. The reduction plant consists of a 15-stamp heavy type battery, crushing to ¾in. mesh, and two tube-mills, the all-sliming process being used. The pulp is then run over the amalgamating tables, and thence to the cyanide plant. There are three 5-ton filter presses, which are now treating the current product of the mill and the accumulated slimes. The power plant is housed in an adjoining building, all the machinery being conveniently close to the shaft head. The treatment of the ore is such as to necessitate a minimum quantity of water, and there is little reason to fear any serious shortage during the present drought.

The Elumba.

The pessimists (of whom there are many in South Africa) shake their heads knowingly over the closing down of the Elumba, and say, "I told you so." I have it on the best authority, however, that this is only a temporary measure decided upon mainly on account of the prevailing market depression. With a reef which has maintained good values for 300 feet in depth and over a long strike, this seems a truer judgment than that of the wiseacres, the arm-chair critics who are always too ready to take the worst view of things. Undoubtedly poor patches have been encountered in the mine, but, on the other hand, high values have been exposed after further work. Then again, a company has always got its worst time to face during development operations, especially as regards public opinion. They are working more or less in the dark. With the stamps dropping, and decent outputs being declared, they are free from criticism. The reduction work of the late owner resulted in continuous outputs for some years averaging some 17 dwts. Further development by him exposed a longer strike, and good values and careful sampling by well-known engineers confirmed his high opinion of the mine and the verdict of the battery. The property has been further developed by the company for some twelve months, and has, as a matter of fact, arrived at a stage when it justifies the erection of a battery. I believe that the general manager of one of the interested companies is now in England, and a few more months will probably see the Elumba adding to the gold production of Rhodesia.

Prospectors are asking what the B.S.A. Mining Company has been floated for. New blood and more capital we certainly require in the country, but it appears that the object of the company is less to go in for serious work than to send out men to sample and thus value the mineral wealth of the districts. I am fully aware that the cry among the engineers is for something big, even if it be low-grade. Yet I venture to say that the smaller rich reef is the more profitable undertaking. That at least is the opinion of the small man, and the opposite view taken by mining engineers and speculators from down country is against observed facts, at all events in Rhodesia. A 2 ft. reef at 15 dwts. is considered of less value than a 4 ft. lode running 7½, though the gold contents in each 100 ft. block are equal. I may be questioned, yet I have heard the point hotly argued by reputable mining engineers. If wrong, I am open to conviction, but the prejudice in favour of the big low-grade show which obsesses our mining magnates, quite baffles me. Probably they have good reason for it, and they would do our Rhodesian prospectors a good turn by a lucid explanation. To return to the B.S.A. Mining Company, one stumbles across their emissaries in every district, and their cry is always "Not big enough." As a result, many promising claims have been turned down, and one is even now being worked with a 5-stamp mill, and some two years' development ahead of it. The prospects, moreover, are bright, and further extensions have been discovered. The owner is still scratching his head and asking why no offer even was made, as he was prepared to accept any reasonable proposal. But in spite of its disabilities,

Bembesi Prospers.

It is merely awaiting more settled financial conditions to startle the country. On every hand new work is being quietly pushed ahead, and it is being conclusively proved almost daily that the old theories have to go by the board and deeper sinking undertaken. To the prospector with a light purse this is, of course, serious, and all sorts of privations have to be endured that the mine may not be left undeveloped. A few more mills running would help things along, and I think that a Customs mill might be a profitable enough speculation if centrally placed. The possibilities are endless, but so also are the disabilities arising from want of capital. Last year a man was told that his property, if in Gatooma, would fetch £500. In Bembesi he would have to do a little more work, and probably spend the better part of £500 in proving his property. One day some bold man will step in and have the courage to commence work in the district, someone to whom the reputation of the district matters nothing. One who is guided by facts, and not by vague theories. Then progress—rapid progress—will be made, and the dweller in Bembesi will see visions of the millennium. Curiously enough, all mining men are impressed by the prospects; it seems merely to be a matter of courage. At present mines are to be had at absolutely rock-bottom prices; in another year, what with new development and better times, men will be in a position to demand bigger and *fairer* terms. As an instance of how quickly mines spring into life, I may mention

The Jumpers.

This mine is situated about three miles south-west of the Matabele Queen's, and twelve months ago work was commenced upon it by the first owner, Mr. Newton. A six by four prospecting shaft was sunk and promising values exposed, and a level driven at 100 ft. depth on the incline. A crushing of the ore from this work (running about 7 dwts.) provided funds for exploitation on a bigger scale, and finally arrangements were made for a partnership with Mr. J. P. MacCay. The main incline shaft has now reached a depth of about 220 feet, and two levels have been driven, and a strike of 200 feet of good ore fully developed. The reef extensions have been picked up on the surface, and the owners are now sinking a winze on the southern end of the claims in marvellously rich stuff. A clay dyke has been struck at depth partially cutting out the reef, but this has now been passed, and has marked an enrichment of the reef. At the contact fabulous values were exposed, but only a small portion of the ore from this section will be put through the mill at present at work on the development dump. The owners hope that by the time development ore has been crushed the main shaft will have reached the 300 feet level. The average width has been estimated at some 48 inches of a milling value of 10 dwts., but this does not include any of the richer quartz encountered below the 200 feet level. The proposition is, therefore, resolving itself from a large medium-grade into a large high-grade proposition. Cross-cutting from No. 2 level, the owners have intersected two parallel reefs panning well, but the ultimate value of these has not yet been established, but little development having been executed. It seems reasonable to suppose that they are an important asset, however, and the owners have great hopes of at least one of the two. The surface equipment includes a 5-stamp 850 lbs. battery; a 20 h.p. loco. type boiler hauling engine, and very shortly will have a cyanide plant added to it. Water is being obtained from the Pinafore claims some 1,500 yards distant, and the necessary pumping plant has been laid down.

(To be continued.)

Explosives for Coal Mining.

The investigation of various explosives form one of the matters engaging the attention of the Bureau of Mines of the United States at the present time. In explosives for use in open air, for example, in quarrying or railroad excavation, strength and efficiency are the qualities which are most important, and usually the only ones that need consideration. Explosives used in tunnelling must not only possess strength and efficiency, but must not give off large quantities of poisonous or offensive gases. In explosives intended for use in coal mines, in addition to these two properties, it is important that the explosives should be of such nature as not readily to ignite explosive mixtures of gas or coal dust. Although it has been found that every known explosive, if fired in a sufficiently large charge, will cause the ignition of an explosive gas mixture, the different explosives have been found to differ widely in regard to the amount which can be fired without causing such ignition. For example, ordinary black powder will cause the ignition of explosive gas charges readily, as little as 25 grams serving to bring about this result. Some of the permissible explosives under exactly similar conditions invariably fail to cause ignition of the explosive gas mixture even in quantities as great as 1,000 grams. Those explosives which satisfactorily pass such tests as show that they can be fired in considerable quantities in explosive gas mixtures without causing an ignition, and in addition possess such qualities of stability, etc., as to make them reasonably safe to handle and transport are termed "permissible explosives," and only such explosives are suitable for use in coal mines in which dangerous quantities of firedamp or inflammable coal dust are likely to be met. Although certain explosives may be branded permissible or non-permissible by the United States Bureau of Mines, nevertheless, the Government does not compel nor prevent the use of any explosive nor prescribe the conditions of use. It can only advise the public as to the character of the explosives and as to the manner in which they should be used. The authority controlling the use of the explosives lies with the legislatures of the several States and the regulations in different States have been far from uniform. Since an inflammable gas mixture can be ignited either by a high temperature acting for a short interval, or by a lower temperature acting through a longer time, the problem of preparing a safe explosive is that of making a mixture which shall produce a low temperature of short duration and shall nevertheless produce a sufficient quantity of gas to perform by its expansion the work for which the explosive is intended. In general, the manufacturers of explosives in the United States have co-operated promptly and cordially with the work of the Bureau of Mines, and by the 1st January, 1910, there had been received at the Pittsburg testing station 51 applications for the testing of 134 explosives. During that year 64 of the explosives submitted were tested and 36 of these passed the test required to place them on the list of permissible explosives. The methods of testing are fully described in Bull. 15 of the U.S. Bureau of Mines.

Bechuanaland Gold.

Mr. W. R. Moir is negotiating with a view to the flotation of his property, the Mascot, situated at Kraaipan, about 38 miles from Mafeking. Mr. Moir has put down six shafts on the schists. Mr. Moir claims to have traced the reef for over a mile. The reef, he says, is from 24 to 30 feet wide, giving satisfactory values.

Danish pebbles were exclusively used when tube-mills were introduced in America. In fact, the pebbles came from Iceland, being distributed from Copenhagen. Now pebbles from many localities are available, and hard ore is commonly used for grinding.

E. J. MOYNIHAN,
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LATEST RHODESIAN MINING NEWS.

A New Gold Rush—An Optimistic Speech—Progress at the Falcon—The Eldorado Declares a Dividend and is Silent About Development—Outlook for Rezende.

THE *Bulawayo Chronicle's* Umvuma correspondent states that a gold "rush," which may prove of considerable importance, and which caused great excitement, occurred there a few days ago on the farm "Onzverst," owned by Mr. H. von Tonder. The property is situated in the Charter district on the Mnizi, about 24 miles north-east of Umvuma. About 60 prospectors, and others, have pegged ground in the vicinity. The reef is reported to be about 5 feet wide, and assays are variously said to go some 10 ozs. to the ton on the surface, and about 14 ozs. at a depth of 10 feet.

* * * *

Speaking at the annual Rhodesian dinner, which took place in London recently, the Marquess of Winchester said he anticipated great things from the Land Bank, and it was hoped before long to introduce a scheme by which they would have no difficulty in securing a large and industrious population. The Chartered Company, he declared, was now able to ask for colonists with energy, without capital. Sir Starr Jameson was to have been the guest of the evening, but illness prevented him attending. Sir Arthur Lawley, a former Administrator of Matabeleland, spoke, and during the evening a cable message of greeting was read from the Rhodesian Pioneers and Early Settlers' Society.

* * * *

The following particulars are taken from the report of the Falcon Mines, Ltd., for the three months ended March 31st:—Development: Drives, crosscuts, shafts and winzes, total, 1,444 feet. No. 9 shaft, No. 3 level east, No. 14 crosscut—750 feet east from the shaft—driven 33 feet; highest value, 5s. per ton. No. 4 level east, No. 6 crosscut north—350 feet east from shaft driven through reef; total width, 65 feet, averaging 54s. per ton. No. 8 crosscut south, 450 feet east from shaft—driven 35 feet.; total, 50 feet; average value, 31s. per ton. No. 8 crosscut north—driven 27 feet; average value 33s. per ton. No. 5 level east, No. 1 crosscut south, 50 feet east from shaft—driven 47 feet; total width, 65 feet, averaging 61s. 6d., or reduced value 57s. per ton. No. 2 crosscut south, 100 feet east from shaft—driven 48 feet; average assay value, 52s. per ton. No. 4 crosscut south, 200 feet east from shaft—driven 20 feet, average assay value 93s. per ton. No. 5 level west, No. 1 crosscut south, 50 feet west from shaft—driven 26 feet; total 45 feet; average assay value, 45s. per ton.

* * * *

The following cable has been despatched to the London office of the Shamva Mines, Ltd.: "No. 3 level, crosscut No. 5 north, 50 feet east of crosscut No. 4, cut reef at 20 feet in, giving an average assay value of 4·4 dwts. over 10 feet of reef exposed so far. Reef continuing."

A cablegram has been received at the Bulawayo office from the London board of the Eldorado Banket G.M. Co., Ltd., stating that a 15 per cent. interim dividend has been declared, payable to shareholders registered at the close of business on the 30th June.

* * * *

The annual report of the Rezende Mines, Ltd., to 31st December last states that the profit and loss account, after deducting London expenses, £1,340, depreciation £2,066, etc., shows a credit balance of £13,110, which, together with the amount carried forward, makes a total of £22,425. The ore reserves consist of 102,248 tons fully developed and 36,268 tons partially developed. Of the 102,248 tons fully developed, 80,928 tons have an average estimated value of 7·0 dwts., while the remaining 21,500 tons represent the developed ore in the old west workings, and the value of these cannot be given till the sampling results have been confirmed by trial crushings. These reserves do not include the balance of ore in the old west workings remaining to be worked by tributors amounting to about 40,000 tons. The mine development stands at a relatively higher figure than last year, viz., £24,078 for drives, etc., as against £15,750 last year, the respective ore reserves being 138,696 tons, as against 130,013 tons last year. The financial results are somewhat less favourable than were anticipated, owing first of all to the fall in grade from 7·6 dwts. to 7·03 dwts., and secondly to the loss in tonnage milled, the latter due to the hanging up of ten stamps for repairs for 39 days. The directors have deemed it advisable not to distribute at present any portion of the existing profits, which they propose to carry forward to the credit of profit and loss. Their reasons for doing so are: (a) Certain negotiations pending between the company and the Penhalonga Mines, Ltd.; (b) the development of the old west workings which will necessarily entail certain expenditure; (c) the cost of the auxiliary power plant on the Odzani River already referred to.

* * * *

It is reported that extremely good values, though from a reef which is quite narrow, have been encountered on Huntly's claims, in the Matopo district, over which Mr. P. S. Triggs, of Gatooma, has an option.

* * * *

Mr. W. Olive, formerly representative of the B.S.A. Company in Capetown, has been appointed manager of the Rhodesia Land Bank. All applications for loans must, in future, be addressed to him at Scott's Buildings, Bulawayo.

* * * *

Mr. A. P. Fletcher, surveyor and assayer at the Gaika mine, has undertaken the control of development work on the Zabonkwe claims, Hunter's Road, on behalf of the Goldfields Rhodesian Development Company, who have an option on the property.

New African Concessions.

POSSIBILITIES OF FALLS POWER.

Speaking at the first ordinary meeting of the New African Concessions Syndicate, Limited, held in London in mail week, Mr. W. A. Wills, presiding, said the syndicate was registered in April, 1910, and took over the assets of the Old African Concessions Syndicate. He detailed the Syndicate's large holding in the Victoria Falls Power Company, and said that they also owned a concession over the water power of the Victoria Falls for an unexpired period of approximately 70 years, less the rights to 250,000 h.p. which they had leased to the Victoria Falls Power Company. Proceeding, he said: As the Victoria Falls Power Company stands to-day, it is, I believe, only the second largest power company; but when the plant at present under contract is completed it will be the largest electrical supply company in the world. They are, for the moment, disposing of about 400,000.000 units of electricity and compressed air; but within two years time they will be supplying, under existing contracts, over 700,000,000 units of electricity and compressed air per annum. While these large constructions are going on it is, I think you will agree with me, impracticable to take in hand the great ultimate business which lies in prospect from the harnessing of the Victoria Falls. Our hands are already exceedingly full; but that there are great prospects in view I think is self-evident. I believe that most people are agreed that a great future exists at the Victoria Falls; *inter alia*, for electro-chemical industries, such as the manufacture of atmospheric nitrates, the electrolytic smelting of difficult ores from the mineral fields of Northern Rhodesia, and for congeries of miscellaneous industries which usually, or invariably, gather round a central supply of cheap power, and which is responsible, at Niagara and other centres of electrical power, for a very large portion of the sales.

THE RHODESIA GOLD MINING AND INVESTMENT CO.

Points from the Consulting Engineer's Report.

The report of the consulting engineer to the Rhodesia Gold Mining and Investment Co. (Mr. C. B. Kingston) on the operations of the company for the year ended December 31st last, is dated Bulawayo, March 7th. It contains the following information regarding properties in which the company is interested :—

Lonely Reef Gold Mining Co.—This property has been actively developed under the supervision of your engineering department. The main shaft has been carried down to a depth of 896 ft. The 6th and 7th levels have been opened out with most gratifying results, and the 8th level will be opened out early in the current year. The ore reserve has been increased to 140,344 tons of 22.65 dwts. ore. The estimated net profit in sight has been increased to £456,700. The new reduction plant was completed and started in July. The plant runs smoothly, but the regular running was upset in October by a complete dislocation of transport due to an outbreak of cattle sickness, and the arrested movement of all transport cattle in accordance with a Government regulation. This temporary condition has since been overcome. An extra tube mill is being added to the plant because it is found necessary to grind the ore to a greater degree of fineness than that indicated by the preliminary experiments, owing to the fact that the gold in the ore at the lower levels is more firmly encased in the quartz than it is in the upper levels, which alone were open for sampling when the experiments were made. Detailed reports on all the work have been supplied to the board of the Lonely Reef Gold Mining Company, Limited. The outlook for this mine is extremely promising, and your interest in this company is very valuable.

Sabi Gold Mine.—The option to purchase this mine has been exercised, and the property has been taken over and transferred to the Sabi Gold Mining Company, Limited, which was floated for this purpose during the year. The mine has been actively developed throughout the year with satisfactory results. The main shaft has been sunk to a depth of 763 ft. The 6th level has been opened out with good results, and a cross-cut to the reef has been started at the 7th level. As the ore shoot dips away from the shaft somewhat rapidly, an auxiliary inclined shaft in the heart of the ore shoot has been started to hasten development. It is gratifying to note that the value of the ore is keeping up well in the bottom levels. Detailed reports with plans have been supplied to the board of the new company. The ore reserves have been increased to 55,465 tons of 9.6 dwts. ore in the main shaft workings, and 3,638 tons of 8.2 dwts. ore in Sabi No. 2. The estimated profit in sight is £36,478. Provisional plans for a new reduction plant have been prepared, so that the machinery may be ordered without delay as soon as the board of the company decide to proceed with the erection.

Sabi No. 2 (White's Sabi).—The option to purchase this property has been exercised, and the mine is now being worked in conjunction with the property of the Sabi Gold Mining Company, Limited. Prospecting and development work have been carried on vigorously, and some promising bodies of ore have been discovered. One body of ore in particular has been opened up at shaft No. 21 with most encouraging results. This has been followed in the 1st level for a length of 112 ft. and found to average 8.85 dwts. over 38.4 ins. There is still good ore in both the faces of the drive, and it is hoped that a fine shoot of ore may be developed here. Full details of this work have been included in the annual report addressed to the Board of the Sabi Gold Mining Company, Limited.

Bernheim Mine.—Work has been carried on at seven points, viz. : —In the Rothschild Parallel Reef; in the Vesuvius Claims; in the Bernheim Adit; in the De Beers Block; in the Rothschild Extension; in the Mount Moriah; and in the Frizington Keswick. The Rothschild Parallel shaft has been repaired to the 4th level, and has been sunk to a depth of 443 ft. The 4th level has been extended 134 ft. east and 181 ft. west. Two winzes have been started and sunk 90 ft. and 35 ft. respectively. Promising results have been met with on all points, and there is every prospect of a good sheet of ore being opened here. Already a reserve of 4,427 tons of 11.46 dwts. ore has been developed. It became impossible to work at the lower levels with steam pumps, and, therefore, a small air compressing plant has been installed. This supplies compressed air for the pumps, and at the same time ventilates the shafts and drives. Two prospecting winzes have been sunk on the Vesuvius from surface to water level. Pumps will have to be installed before these winzes can be sunk to the proper level for opening up the reef. This will be done during the current year. The winze from the Bernheim Adit has been sunk to the 2nd level, and a drive has been extended west in the direction of the ore shoot. The ground here has been disturbed by a fault, and the ore has not yet been found. The drive is now on the line of the reef, and it is probable that the ore shoot will be found within a short distance. This work has been suspended until arrangements are made for the efficient ventilation of the drive. The rest of the work has all been prospecting. Some encouraging results have been met with, and these will be followed up as soon as possible. Details of all this work have been embodied in special reports.

Felixburg Claims.—These claims have been worked during the year. Small shafts have been sunk on the Pick Up, the Helpmakaar and Sunbeam Blocks. Promising shoots of ore have been opened on the Pick Up and Sunbeam Blocks, but on the Helpmakaar the work has been stopped by heavy water. The ore bodies in this district are not large, but the ore is sometimes very rich. The quartz contains coarse gold, and is rather erratic in value. Arrangements will be made to develop the ore bodies that have been exposed, so that they may become productive at an early date. Special reports have been submitted describing this work in detail.

Pretty Polly Mine.—A half interest was taken in this mine with the New Rhodesian Reduction Company, Limited. The mine has been worked under the direction of Mr. A. H. Ackermann, resident mining engineer of the B.S.A. Company, who has been acting as consulting engineer for the New Rhodesia Company, Limited. Detailed reports on the work have been submitted by Mr. Ackermann.

Claims Purchased or Sold.—The company has sold 29 blocks of claims adjoining the Sabi Mine to the Sabi Gold Mining Company, Limited. These claims have been incorporated in the property of the Sabi Gold Mining Company, Limited. There are numerous outcrops of reef on these claims, some of which have been found to carry high gold values. No continuous ore shoots have been developed, but prospecting has not been carried far enough yet to be conclusive. It is probable that some good bodies of ore will be found as the work proceeds.

Claims Pegged or Abandoned.—Eight blocks of claims were pegged for the company adjoining the Bernheim Mine. These have not yet been prospected. The Roadway Claims in the Belingwe district which were pegged in 1910 have been abandoned after being thoroughly prospected without finding any bodies of pay ore.

Electro-Metallurgy of Tin.

In speaking of recent experiments upon the electro-metallurgy of tin the "Journal du Four Electrique" (January, 1912) reaches the conclusion that the solution of the problem has been found as regards general lines of work, and that it remains only to study the minor questions of detail. The statement is made that the yield of tin ores is much increased by electric-furnace treatment, that the process is continuous as against intermittent smelting in the reverberatory, that the formation of "hardhead" is reduced greatly, and that the quantity of carbon necessary for reduction is no more than 14 per cent. in the electric furnace, as against 20 to 25 per cent. in the reverberatory. The floor space necessary for the installation is smaller, and the consumption of the electrodes is negligible. Some calculations are given as to the energy required for the reduction of cassiterite; the basis of these calculations is as follows :—For the reduction of 118 grams of tin from stannic oxide, 145,300 gram cal. are required. The reaction, $C + O_2 = CO_2$, gives out 96,960 cal., and the reaction, $2C + O_2 = 2\,CO$, 58,000 cal. It is necessary, then, in order to set free 118 grams of tin, that we should have, for the first reaction, 145,300 – 96,960 cal., or 409.661 kg.-cal. per kilogram of tin set free, and since 1 kw.-hr. equals 864 kg.-cal., it is necessary per ton of tin to have 474 kw.-hr. of energy. This figure become 855 kw.-hr. if we apply the equation of $2\,C + O_2 = CO$. As in practice, each of these reactions gives about 50 per cent. of the reduction, it is necessary to count on the average as the consumption of energy required, which is 665 kw.-hr. per ton of tin. The temperature in the smelting zone is estimated at 1,400 or 1,500° C., and the calorific balance of the furnace is then as follows :—For the reaction, 665 kw.-hr.; for heating the slag, 130; for the specific heat, 45; losses by radiation, 130; losses through hot gases, 130 kw.-hr.; a total of 1,140 kw.-hr. per ton of tin. The experiments were made in a furnace like that of Harmet for the reduction of iron ores, constructed of magnesite brick. A product was obtained containing about 99 per cent. tin, a little iron, and free from arsenic. At the beginning of the campaign, which usually lasted from 10 to 12 days, the furnace was heated for a day with wood and coke in order to dry the bricks, and then charged with about 14 kg. of anthracite coal per 100 kg. of ore, this proportion, however, depending on the nature of the latter. A current was then passed of about 1,000 amp. at 60 v., these figures changing to 40 v. and 2,500 amp. when the reaction commenced. A half-hour afterward the slag commences to form, and its aspect alone suffices to show whether the charge is of the proper composition or not. Experiments have also been made to recover the tin from the furnace slags by an electrolytic method. These were fused with soda and the mass afterward dissolved in water and electrolysed with plates of iron as a cathode. Excellent deposits of tin were obtained, but the yield was not high.

Representations have been made to the Minister of Railways and Harbours by the Chamber of Mines with regard to the periodical congestion that occurs in the transport, and consequent delay in delivery, of coal to the mines, and the Minister has replied that he is making enquiry into the matter.

THE WEEK IN THE SHAREMARKET.

Quiet but Ending Steady—Improving Outlook.

VERY little business was put through this week, but there was a perceptibly improved undertone towards the close. Many brokers are taking holidays, and some are temporarily leaving the Exchange. Undoubtedly the stagnation of the past few months has hit several, and it is difficult to remain hopeful in face of so many disappointments. It is to be hoped that the Government will take the warnings of Sir Jan Langerman, Mr. Merriman and Sir David Harris to heart, and show a more sympathetic spirit towards investors. The Stock Exchange is the chief agency and clearing-house for the inflow of capital to the country, and naturally is the first to feel the effects of a cessation of that inflow. The dividends are most satisfactory, and we know that the houses are unshaken in their belief that things will mend sooner or later.

	*	*	*	*		
	Friday, 21st.	Sat., 22nd.	Monday, 24th.	Tuesday, 25th.	Wed., 26th.	Thurs. 27th.
African Farms	15 6B	15 6B	15 6B	15 3	15 6	15 3B
Adair-Usher Process	1 6S	1 6B	1 0B	...	...	1 6S
Apex Mines	33 0B	33 0B	32 6B	30 3B	30 0B	31 9
Bantjes Consolidated	24 3B	24 0B	24 0B	24 3B	24 0B	24 0B
Benonis	5 9	4 9B	5 0B	4 9	4 9B	4 9
Bushveld Tins	1 1B	1 2B	1 2B	1 1B	1 1B	1 2
Brakpan Mines	76 6B	77 0B	77 6B	76 0B	76 6	76 6
Blaauwbosch	21 0B	21 0B	20 0B	...	20 0B	20 6
British S A.	...	27 9S	...	...	26 6B	28 0S
Cinderella Cons.	25 0S	...	...	22 0B	...	...
City and Suburban	53 0B	53 0B	53 3B	52 0B	52 9B	52 6B
City Deeps	56 0B	56 6B	...	55 0B	56 0B	55 0B
Cloverfield Mines	5 6B	5 0B	...	5 0B	5 0B	5 0B
Cons. Langlaagtes	23 0B	23 0B	22 9B	22 9	23 9B	22 9B
Cons. Main Reefs	19 3B	19 6	19 3B	19 6	19 3	19 6B
Coronation Freeholds	0 6B	0 6B	0 6B	0 6B	...	...
Con. Investment	...	...	...	...	20 0B	20 0B
Concrete Cons.	10 0S	5 0B	...	...	...	7 0B
Clydesdales	12 0B	...	11 6B	...	11 6B	11 6B
Cons. Mine Selections	13 0B	13 0B	13 0B	12 6B	13 0B	13 0B
Crown Diamonds	...	...	...	...	...	5 0S
Crown Mines	...	142 6S	137 6B	...	...	137 6B
East Rand Cent.	10 6	10 3B	10 6B	10 0B	...	10 3
East Rand Coals	2 4B	2 4B	2 6S	2 3B	...	2 4B
East Rand Deeps	2 3B	2 3B	2 3B	2 3B	2 3B	2 3B
East Rand Props.	60 0B	60 0	60 0	59 6	59 6	60 3
East Rand Deb.	...	£94	£95	£94½	£95	...
Eastern Gold Mines	1 9B	1 9B	1 9B	1 9B	1 9B	1 9B
Frank Smith Diam.	8 0B	8 0B	...	8 9B	...	8 6B
French Rands	1 0B	1 0B	1 0B	...	...	1 0B
Govt. Areas	25 0B	25 0B	25 0B	24 9	24 6B	24 9
Glynn's Lydenburgs	23 0B	23 0B	23 6B	24 0	23 6B	24 0
Ginsbergs	30 9	...	...	28 0B	...	29 9B
Glencairns	3 0B	3 0B	5 0S	...	3 0B	3 6B
Glencoe (Natal) Colls	...	6 0B	5 9B	5 6B	5 6S	5 9B
Jumpers	...	10 6S	10 6S	10 6S	7 0B	...
Jupiters	11 3B	11 6	11 3B	11 0B	11 6S	11 3B
Kaalfontein Diamonds	0 6B	0 6B	0 6B	0 6B	...	...
Klerksdorp Props.	3 3B	3 0B	3 0B	3 0B	3 0S	3 1B
Knight Centrals	14 6	14 3B	14 3B	14 0B	14 0	13 9
Luipaardsvlei Estates	7 9S	7 6S	7 3B	7 3B	7 6S	7 6B
Lace Props.	3 0B	3 0B	3 0B	3 0B	3 0B	3 3S
Lydenburg Gold Farms	...	...	...	...	2 9S	2 3B
Main Reef Wests	26 6B	26 3B	26 6B	26 6	26 0B	27 0B
Modder B's	57 0B	56 3B	56 0B	57 0B	57 6B	58 0S
Midas Deeps	0 6B	...	0 4B	0 3B	0 5B	0 6S
Middelvlei Estates	...	2 0S	1 9B	1 4B	...	1 3B
Modder Deeps	30 0B	...	...	...	...	29 6B
Meyer & Charltons	91 0B	...	...	...	...	...
New Eras	8 3B	8 3S	7 9B	7 3B	7 6B	7 6B
New Kleinfonteins	28 0B	29 0	28 9B	29 0B	29 0S	29 0B

B Buyers. S Sellers.

	Friday, 21st.	Sat., 22nd	Monday, 24th.	Tuesday, 25th.	Wed., 26th.	Thurs. 27th.
New Rietfonteins	...	7 6B	...	8 6	8 0B	8 0B
New Unifieds	19 6	19 6S	19 6S	...	18 0B	19 6S
New Boksburgs	1 9B	1 9B	1 9B	1 9B	1 9B	1 9B
Nigels	18 3B	...	15 0B	...	...	...
Nourse Mines	...	33 9B	33 9B	...	...	34 6B
Orange Diamonds	1 4B	1 4B	1 4B	1 4B	1 6B	1 5B
Premiers Deferred	...	...	187 6B	...	...	...
Pretoria Cement Co.	56 6S	55 0B	56 6S	55 6B	57 0S	55 0
Pretoria Estates	17 6S	...	17 6S	17 6S	17 6S	...
Paardekraal Estates	1 0S	...	...	...	...	...
Potchefstroom Est.	1 0B	...	1 0B	...	...	...
Princess	...	10 0	...	9 6B	9 0	...
Rand Collieries	6 0	...	...	...	...	...
Rand Nucleus	2 11B	2 11B	2 9B	2 9B	2 9B	...
Randfontein Estates	28 0B	28 0B	27 9B	27 9	28 0	28 0
Randfontein Deeps	4 0B	4 0B	4 0B	4 0	4 0	4 0B
Rooiberg Minerals	34 9B	34 0B	34 0	33 6	34 0	34 0
Rand Klips	4 10	4 6B	4 9B	4 7B	4 6B	4 7B
Ryan Nigels	...	3 9B	...	3 9B	3 9B	3 9B
Rood. Durban Deeps	26 0B	...	26 0B	25 0B	26 0B	...
Robinson Deeps	52 6S	...	...	...	...	48 9B
Swaziland Tins	37 0S	...	...	...	...	...
Simmer Deeps	4 0S	4 0S	4 0S	4 0S	...	...
South African Lands	4 3B	4 3B	4 3	4 4	4 4B	4 5
S.A. Tin Mines	...	7 0B	...	...	...	...
S. Randfontein Deeps	3 3B	3 3B	3 3B	3 3B	3 3B	3 3B
Sub Nigels	5 9B	4 0B	4 10B	4 10B	5 0B	5 0
Springs Mines	15 0B	15 6B	15 6S	...	...	13 0S
Trans. G.M. Estates	46 6	46 6B	46 6B	46 0B	46 6B	47 0B
Temple Tins	3 3B	3 2B	3 0B	3 3S	2 11B	...
Trans. Coal Trusts	50 0S	17 0B	48 9S	...	48 0S	47 3B
Trans. Cons. Lands	...	...	...	...	28 0B	...
Tudors	2 0S	...	2 0S	...	1 0B	...
Van Ryn Deeps	18 9	18 3	18 3B	17 6B	18 0	18 0
Village Deeps	41 0B	41 3B	41 3B	40 0B	41 3B	...
Vogel. Cons. Deeps	0 10B	0 11B	0 10B	0 10B	0 10B	0 10B
Voorspoed Diamonds	...	...	7 6B	10 0S	7 6B	10 0S
Van Dyks	...	2 0B	...	...	2 0B	...
Witwatersrands	...	55 0B	55 0B	...	55 0B	...
Wolhuters	20 3	20 0B	20 0	19 0B	18 9B	19 3S
Witbank Collieries	41 0B	42 0B	...	42 6B	42 6	42 6B
Wit. Deeps	...	50 0B	50 0B	...	50 0B	...
West Rand Est.	2 9B	2 9S	...	...	2 9	2 6B
Zaaiplaats	45 6B	45 6B	44 9	45 0	44 0B	44 0B

B Buyers. S Sellers.

MINING MEN AND MATTERS.

Mr. W. A. Caldecott leaves next week on a well-deserved three months' holiday.

* * * *

Mr. Max Francke is revisiting the Rand on behalf of Messrs. Goerz and Co., Ltd., and the Deutscher Bank.

* * * *

Mr. J. I. Hoffmann, of the firm of Johnson & Hoffmann, is at present in Servia in connection with several important mining propositions.

* * * *

It is notified that the Commission of Examiners for mine surveyors' certificates of competency will hold the next examination on Tuesday, Wednesday and Thursday, the 23rd, 24th and 25th of July, 1912, at 9 a.m., at the South African School of Mines and Technology, Eloff Street, Johannesburg, and also, if found necessary, at Dundee, Kimberley and Bloemfontein. Applications must reach the Secretary, P.O. Box 1132, Johannesburg, by the 10th of July.

GRADE, COSTS, AND PROFITS IN MAY.

Few Fluctuations Mark the Month.

The usual monthly analysis of the gold production for May issued by the Chamber of Mines is presented hereunder :—

THE WITWATERSRAND.

	Total value recovered.	Value recovered per ton milled.	Total working cost per ton milled.	Total working costs.	Working profit.	Working profit per ton milled.
	£	s. d.	s. d.	£	£	s. d.
1. Aurora West United ...	17,165	24 5	20 1	14,130	3,014	4 3
2. Bantjes Consolidated ...	36,497	28 11	23 11	29,905	6,059	4 10
3. Benoni Consolidated ...	7,663	—	—	5,459	2,058	—
4. Brakpan Mines	88,442	33 0	17 7	47,298	40,317	15 0
5. Cinderella Consolidated	29,649	30 4	24 3	23,763	6,057	6 2
6. City Deep	75,915	36 9	24 1	49,083	24,900	12 3
7. City and Suburban ...	53,700	37 9	22 0	30,816	22,381	15 11
8. Cons. Langlaagte	30,469	25 5	20 3	21,446	9,025	8 7
9. Cons. Main Reef	33,022	27 9	20 0	23,797	8,822	7 5
10. Crown Mines	262,726	32 2	18 1	147,628	112,129	13 9
11. Durban Roodepoort ...	15,062	21 3	15 5	10,876	4,176	5 11
12. Durban Rood. Deep ...	38,026	30 0	24 10	33,499	6,021	4 9
13. East Rand Proprietary.	275,295	32 11	21 8	176,549	95,024	11 8
14. Ferreira	25,741	27 10	19 6	17,023	7,046	8 1
15. Ferreira Deep	80,626	46 9	21 4	36,709	43,020	25 0
16. Geduld Proprietary ...	19,302	25 0	20 0	15,098	4,121	5 5
17. Geldenhuis Deep	91,624	31 9	25 3	73,414	17,153	6 0
18. Ginsberg	21,808	31 0	21 3	14,959	6,849	9 9
19. Glencairn Main Reef ...	16,626	15 4	14 4	13,986	2,638	2 8
20. Jumpers-cum-Treasury .	16,664	39 1	36 0	14,576	2,004	4 11
21. Jupiter	44,495	20 5	17 8	38,564	5,348	2 5
22. Knight Central	29,989	23 7	19 7	24,384	5,154	4 2
23. Knights Deep	51,368	17 0	11 2	33,693	17,090	5 8
24. Lancaster West	25,707	22 3	20 5	23,210	2,434	2 2
25. Langlaagte Estate ...	63,508	20 9	18 4	49,445	14,053	5 3
26. Luipaardsvlei Estate ...	15,589	17 10	17 6	14,681	133	0 2
27. Main Reef West	31,845	32 11	21 6	20,822	10,658	11 0
28. May Consolidated ...	17,373	24 6	16 0	11,315	6,017	8 6
29. Meyer and Charlton ...	28,999	40 6	18 7	13,315	17,107	23 11
30. Midas Deep	701	—	—	—	—	—
31. Modderfontein B. ...	59,485	36 6	18 3	29,723	29,069	17 10
32. New Goch	30,167	21 5	16 8	23,471	6,609	4 8
33. New Heriot	23,588	36 1	23 2	14,333	9,104	14 8
34. New Kleinfontein ...	63,045	29 4	19 10	42,693	19,517	9 1
35. New Modderfontein ...	94,593	39 3	19 11	47,596	45,893	19 2
36. New Primrose	35,995	28 0	14 10	18,060	17,934	14 8
37. New Rietfontein	20,835	27 10	23 3	17,377	3,459	4 7
38. New Unified	17,021	31 1	22 5	12,010	5,009	9 4
39. Nourse Mines	84,492	30 5	21 10	59,958	23,489	8 6
40. Princess Estate	24,539	25 9	25 7	24,214	242	0 3
41. Randfontein Central ...	260,985	24 6	17 8	185,275	72,780	6 11
42. Robinson	104,549	41 6	14 10	37,277	65,633	26 2
43. Robinson Deep	79,726	31 3	18 6	47,173	35,705	14 0
44. Roodepoort United ...	33,430	20 0	17 0	28,368	5,041	3 0
45. Rose Deep	97,426	29 10	18 4	59,858	36,524	11 2
46. Simmer and Jack ...	92,384	23 2	11 0	43,899	47,545	11 11
47. Simmer East	29,403	17 2	15 3	26,041	2,973	1 9
48. Simmer Deep	44,397	17 10	16 5	40,882	2,937	1 2
49. Spes Bona Tribute ...	6,257	20 11	—	—	—	—
50. Van Ryn	55,862	27 9	15 10	31,424	24,077	12 2
51. Village Deep	71,362	27 7	19 2	49,543	20,921	8 1
52. Village Main Reef ...	81,505	38 1	18 6	37,325	41,573	20 7
53. Vogelstruis Estate ...	13,478	21 5	21 8	12,483	1,011	1 9
54. West Rand Central ...	3,865	25 10	27 6	3,952	*88	*0 7
55. West Rand Cons.... ...	37,703	27 6	23 1	31,611	6,064	4 5
56 Witwatersrand	46,636	23 3	14 6	29,084	17,554	8 9
57. Wit. Deep	53,959	28 1	19 1	36.344	17,043	8 11
58. Wolhuter	41.636	27 5	17 1	25.926	15,108	9 11
Miscellaneous producers	18,914	—	—	—	—	—
Witwatersrand totals	3,172,833	28 6	18 9	2043318	1073534	9 10
*Loss.			55 cos.	56 cos.	56 cos.	55 cos.

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

	Total value recovered.	Value recovered per ton milled.	Total working cost per ton milled.	Total working costs.	Working profit.	Working profit per ton milled.
HEIDELBERG—						
1. Nigel	20,168	29 5	24 0	15,864	4,079	6 2
2. Sub Nigel	8,984	39 8	33 6	7,580	864	3 10
BARBERTON—						
3. Barrett	1,138	7 6	—	—	—	—
4. Sheba	12.679	40 2	28 2	8,882	3,795	12 0
5. Sheba (Rosetta)	731	41 11	—	—	—	—
6. Worcester	5,666	22 0	—	—	—	—
LYDENBURG—						
7. Glynn's Lydenburg ...	7,744	44 8	23 9	4,118	3,900	22 6
8. Transvaal G.M. Estates	40,273	57 0	21 7	15,245	24,291	34 4
Miscellaneous producers	41,578	—	—	—	—	—
Total (outside districts)	138,961	38 6	24 10	51,692	36,929	17 9
			5 cos.	5 cos.	5 cos.	5 cos.
Grand totals	3,311,794	28 9	18 11	2095010	1110463	10 0

A comparison of value recovered per ton milled, working costs and profits per ton with April shows that the value recovered on the Witwatersrand for May was 28s. 6d. or exactly the same as the April yield. Working costs in May were 18s. 10d., for April 19s. as against 18s. 11d. for March, 19s. 2d. for February, 18s. 10d. for January, and 18s. 5d. for December.

The working profits declared for the Transvaal since the commencement of 1911 are :

	1911.	1912.	Inc.	Dec.
	£	£	£	£
January	954,536	1,021,073	66,537	
February	898,738	930,739	32,001	
March	973,470	1,245,321	271,851.	
April	1,000.043	1,042,076	42,033	
May	981,788	1,110,463	128,675	

The dividends declared during the five months were:

	1911.	1912.
January	£124,782	£99,782
February	23,699	25,987
March	295,384	257,528
April	64,500	75,250
May	58,500	46,000

The annual general meeting of the members of the Chemical, Metallurgical and Mining Society was held last Saturday night in the School of Mines Lecture Theatre. Lieut.-Col. C. B. Saner presided over a large attendance. The election of officers for the ensuing year was declared as follows: President, Mr. R. W. Dowling; vice-presidents, Messrs. H. A. White, K. L. Graham, and A. Richardson; hon. treasurer, Mr. Jas. Littlejohn; members of council, Messrs. E. J. Laschinger, Tom Johnson, A. Whitby, J. E. Thomas, Ralph Stokes, Robt. Allen, Jas. Gray, F. W. Watson, A. Salkinson, M. H. Coombe, Prof. G. H. Stanley, and Prof. J. A. Wilkinson. Mr. Dowling's election was specially welcomed, the fact being mentioned that this was his silver-wedding to the Transvaal, he having come here in 1888. Mr. Dowling returned thanks in a short address, in which he stated that he owed much of his success in life to the Society's assistance. A vote of thanks was accorded the retiring committee and officers. The following presentations were made:—Chemistry: Messrs. T. L. Thorne, W. Anderson, T. J. R. Richards, G. F. B. Ellis, and Joseph Cohen. Metallurgy: Mr. J. P. Symons. Assaying: Messrs. Robt. Murdoch and D. F. Scott. The Consolidated Goldfields medal was presented to Mr. W. R. Dowling, and in making this presentation the chairman complimented the society on having a member capable of securing this medal. Seventeen medals had been given, eight of which had been secured by members of this society, the others going to members of the Institute of Mining and Metallurgy, which had a world-wide membership. The medal was given for the best paper of the year on anything connected with gold mining. Mr. J. P. Braidwood received a special prize for a paper on coal mining, and methods of ascertaining the calorific value of coal. The report of the council was adopted, and a number of interesting papers were read.

THE "LUMINATOR" PURIFICATION TREATMENT OF WATER FOR STEAM BOILERS.*

[By William Cullen.]

Two or three years ago the engineering world learned for the first time that when certain feed waters for boilers were run over aluminium plates, under fairly well defined conditions, scaling was entirely prevented, and scale which had already been formed was loosened and converted into a sludge. Such in brief were the claims made by the discoverers and they were sufficiently startling in all conscience. I need not enlarge on the great disadvantages of scale; indeed they are obvious enough when considered only in the light of the efforts made to prevent its formation. The new method was so simple that few believed in its efficiency, and to-day there are still many unbelievers. Two years ago I was numbered among the sceptics, but to-day I am convinced that, for certain waters at least, the process is absolutely efficacious. Like many others I instituted experiments about which more anon—but I can say here that those experiments all led to negative results, so that they do not enable me to explain in the very least what chemical or physical change takes place in the water. That others have the same difficulties I know, as will be seen from the following brief outline of their views. So far as I can discover there are only two records of real scientific attempts to solve the mystery, and both are recorded in the *Journal of the Socicy of Chemical Industry*. From the first of these it would appear that the discoverer was named Brandes, and he gave the name of "luminator" to a vessel made of aluminium. In the original patent, which was taken out in the names of Neff and Brandes, there was no reference to the prevention of scale in boilers, but the water was supposed to have wonderful cleansing properties, soiled linen being cleansed in a very short time. I have never heard that anything came of this. I have never seen a luminator and I do not think there is one in South Africa—but it appears to be a launder made of corrugated aluminium. While flowing through this vessel something happens which even the inventor could not explain—but the effects I have already mentioned:—"The theory of the action of the luminator is that by the passage of water over the metal channels at certain speeds a current of electricity is induced, the water being negative and the plates positive, and a kind of ionisation of the salts takes place, which makes them fall out in an amorphous form; at the same time aluminium is by friction and electrical action abraded from the surface as colloidal aluminium, which after a time is changed in the water." Just at this stage let me say that in order to make this theory fit in with facts the aluminium must lose weight, but I found in laboratory experiments that this was not so; neither have my somewhat crude luminators lost weight after a year's continual work. The author of the paper had to admit this, for he said that the loss was infinitesimal. The best results (according to the author) are obtained when the luminator is facing either north or south, but an essential condition is that it be exposed to direct light. In his reply to a very remarkable discussion, the author gave some very interesting facts, among which I quote the following:—(1) A litre of water run through the luminator ten times lost 20 degrees temporary hardness. (2) There is no limit to the hardness which could be treated in the apparatus, but for particularly hard waters, say, 80 gr. per gallon on Clark's scale, a somewhat lengthy apparatus would be required. (3) Foaming always ceased when a luminator was used. (4) Milk when passed through the apparatus kept an extraordinarily long time. (5) Traces of nitrites and nitrates were decomposed, and a 2 per cent. solution of magnesium bicarbonate had been converted into carbonate. (6) The corrugations—which are at right angles to the flow—have merely the function of increasing the surface. (7) Certain acid waters and salt water cannot be treated

The second communication (H. B. Lake) was made as recently as December last, and is a record of a very interesting series of experiments to determine what change, if any, is made in the water by it passing through the luminator under conditions which vary both as to light and speed. The differences found were infinitesimal, and were, in my opinion, quite within the limits of observation. However, the author introduced into one of his series of experiments a new factor, viz., the addition of aluminium as sulphate in the proprotion of 3 per 100,000, his idea evidently being that by the presence of sulphate in the water part of the aluminium was converted into sulphate. Whether this is so or not, the action on the water which was subjected to the luminator treatment after admixture with sulphate of alumina, was remarkable indeed—the soluble lime being increased seven-fold. What I mean by soluble lime is, of course, a transference of so-called "temporary hardness" or bicarbonate into "permanent hardness" form or "sulphate." About 18 months ago I had some rough experiments carried out on the lines of those indicated by the two authors to whom I have just referred, and although the results were practically negative, the experiments are perhaps worth recording. The corrugated aluminium launder was about 5 ft. long and about 10 ins. broad. It was exposed to sunlight during the experiments, and the water trickled down slowly over the corrugations. The surface was inclined to become dirty—no doubt from the suspended matter in the water—so it was burnished afresh for each experiment.

Experiment 1.—Treated water was compared with untreated by titration with soap solution. The latter indicated 9.17 $CaCO_3$ per 100,000 against 8.47 for the former—or practically no difference.

Experiment 2.—Two litres, each of treated and untreated water, were boiled down to a bulk of about 100 cc., and were then transferred to beakers, and still further boiled down. In both cases the scale stuck to the side of the beakers, but in the case of the treated water it was more patchy and less adherent than the other.

Experiment 3.—This is a repetition of Experiment 2, but on a much larger scale, 400 litres of each kind of water being employed. The final boiling down was done in porcelain basins, but no difference was observed either in the behaviour or the nature of the residue.

These experiments, as I have already said, led to nothing. So it was determined to try the luminator treatment on a practical scale. Fortunately there were two small 25 h.p. (nom.) Tangye Colonial tubular boilers situated at different parts of the factory available for the experiment. They worked at 100 lb. pressure and used about 3,000 gallons of water in the 24 hours. Both were provided with corrugated launders 8 ft. long by 1 ft. 6 in. wide, set at an angle of 45 degrees. One faced north and the other south. The water trickled over them into a feed water tank and as little steam was used at night the run took place practically all in daylight. I may say also that ordinarily speaking there was so much scale produced that the boiler had to be cleaned out every three or four weeks. Moreover, the scale was of a very adherent nature, so that it was difficult to chip off. It consisted in the main of ferric oxide, and sulphates which have this adherent property. As will be seen from the following incomplete examination the water itself has very little temporary hardness or bicarbonate of lime.

	Before boiling mgm. per litre.	After boiling mgm. per litre.
Total solids in 100° C.	405	390
$Fe_2O_3 \times Al_2O_3$	1.2	.9
CaO	52.5	51.0
MgO	76.8	75.0
SiO_2...	4.0	3.35

Even if the above bases were combined with SO_3 and Cl which were not determined, there would still be a big deficiency, which presumably consists of alkaline chlorides and sulphates—so that the water is abnormally high in these constituents. Admittedly neither the water nor the scale have been examined very thoroughly, but attention was more directed to the results of the practical trials which can be given in a very few woods. First of all, however, I should state that the launders were only cleaned once a week and no special care was taken to burnish them. The experiments were started when the boilers were nearly ready for scaling, and the first effect noticed was that the scale in position commenced to loosen, and much of it was in consequence removed at the blow-off. Then, when the boilers, were opened up for cleaning, much less scale than usual was observed, and what little there was could easily be removed without the slightest difficulty. The aluminium launders have now been in use for fifteen months, and, though on the whole the improvement is not now so marked as at first, that may be the result of want of care and attention to the launders. Certainly the improvement noted at first was very remarkable and striking. Now I do not say that this luminator treatment is nearly so effective as the Kennicot and others, which are well known out here, but for small isolated boiler plants for which it would not pay to instal a water purification system, the luminator treatment is certainly worth trying. I do not think anyone could guarantee that it would be effective, there is so much conflicting evidence, which is due in the main, I think, to the fact that the boiler water used by some investigators is quite different from others. Now, why should running water over aluminium effect any change at all? Frankly, I do not know. So far as I can gather no one has yet succeeded in proving a chemical change. Then it must be physical, one would say, but here again nothing has been proved. Better aeration occurs to one, but this is really no explanation, so I leave the problem to be solved by the members of this society. I might remark in conclusion that the mystery of the divining rod is also awaiting solution.

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* Reprinted from the March number of "The Journal of the Chemical, Metallurgical, and Mining Society of South Africa."

Transvaal Coal Trust.

An interim dividend (No. 25) of 7½ per cent., equal to 1s. 6d. per share, has been declared by the board for the half-year ending June 30, 1912. This dividend will be payable to all shareholders registered in the books of the company at the close of business on June 29, 1912, and to holders of coupon No. 25 attached to share warrants to bearer.

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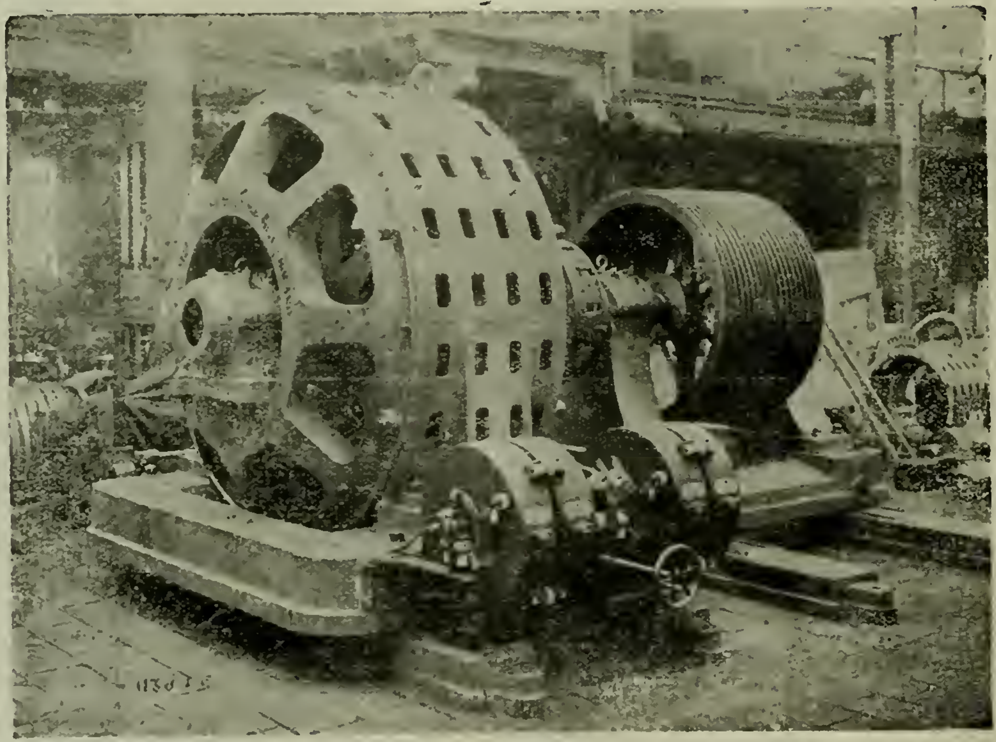

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Engineering Notes and News.

A New Ramie Decorticating Machine.

The International Fibre Company has recently been exhibiting one of its fibre decorticating machines, patented by the president of the company, in New York City. The machine strips both hemp and ramie, and produces a fibre that can be used without rotting or degumming, in the manufacture of all kinds of rope, twine, etc. A 15 h.p. traction engine will drive two machines, which will each treat two to two-and-a-half tons of hemp per day of 10 hours. The patent, it is said, will make ramie an important cordage fibre, and it is contended that, as ramie is the most difficult of all plant fibres to be separated or cleaned from the stalks, a machine that does this successfully can clean flax, hemp, jute or any other kind of vegetable fibre. The company proposes to produce ramie and hemp in California, and in its prospectus states that hemp will pay a net profit of 100 dollars per acre and ramie more than double that amount.

Liners for Tube Mills.

The works of the Tube Mill Patent Consolidated, Ltd., have recently been removed to Saratoga Avenue, Doornfontein, and last Saturday afternoon a demonstration of the manufacture of tube mill liners was given in the presence of those interested. The liners are the invention of Mr. J. G. Gibson, the works manager of the company, and under his charge about 700 or 800 of these concrete blocks are being turned out daily. This means of lining tube mills has for some time been adopted by the Randfontein group, and other mines are also using them. The blocks are fitted into tube mills, and it is claimed that by their adoption the mills do not need relining so often, thus increasing their efficiency. The blocks are built in segments, in which steel pegs, projecting from the surface of the concrete, are embedded. When first installed the concrete is 3½in. thick, with pegs projecting 1¾in., or 5¼in. over all. Other sizes of these liners are produced by the company. Another variety is the concrete blocks, 6in. thick or less, reinforced with steel pegs of corresponding length, made flush with the top of the concrete, while another form comprises those made of the best chert blocks, 6in. thick, built into the tube mill, with rows of steel pegs cemented in between the blocks. The ore after going through the stamps is placed into the tube mills, and the projecting pegs present spaces for catching and holding the grinding pebble or other grinding charge, thereby forming a second and protecting liner. The mill is therefore well protected in grinding the ore into a pulp, and has a longer life. Cheapness is a further advantage obtained by the adoption of these liners. Messrs. Greig & Wilkinson are the agents.

Bell Signalling and Cable Systems in Shafts at the Crown Mines, Limited.

The following detailed account of the signalling system was prepared by Mr. Curtiss, electrical engineer for the Crown Mines, Ltd., and is published through the courtesy of Mr. W. W. Mein.

Signalling System.—This allows the interchange of signals between any station and the engine-driver, such signals sounding at all stations In its simplest form it consists of a battery preferably of accumulators, a bell and pull at each station and at surface, and three wires connecting all stations with the surface. One battery wire is connected to a terminal of every bell, the other to a terminal of every pull, and the third wire forms a common connection between the terminals of both bells and pulls. The two battery wires may, and in practice generally do, feed a number of systems, though, of course, there must be a separate "common" wire for each system.

Bell Cable.—Where any trouble from moisture is likely to be experienced, bell cable is used. This consists of a number of rubber-insulated wires incased in a lead covering which in turn is covered with jute and armoured with steel wires. There is a final covering of jute over all to prevent corrosion. The standard cables are 4-core and 7-core, but special cables may be made up as desired. The copper in each core generally consists of seven No. 20 S.W.G. wires, equivalent to about 9,000 circular mils.

Junction Boxes.—At each station where bells are desired the main cable is taken in and out of a "T" junction box. A branch cable from this box is run to the bells and pulls in the station. In the junction box is a marble terminal board with binding post passing through it. Each of the wires of the incoming and outgoing and branch cables is connected to the bottom of a binding post, and the box is then filled with paraffin wax or compound, level with the top of terminal board, thus sealing all cable ends. The connections between the upper parts of the binding post are made with copper straps which may be easily removed when testing for faults. The box is provided with a lid which when bolted down makes the box quite water-tight. It is not customary to use these boxes in situations where trouble from moisture need not be feared.

Bells.—Any water-tight bell may be used, but probably the most satisfactory type is that manufactured by Siemens, Limited. This has the mechanism enclosed in a water-tight metal box, on the side of which is soldered a metal diaphragm. The armature is attached to the inside of the diaphragm and the bell-hammer to the outside of the same. This allows the parts damageable by moisture to be hermetically sealed.

Pulls.—There are many satisfactory forms of pulls and push-buttons. If used in very wet places, it is well to fill the pulls with vaseline.

Distance Between Junction Boxes.—If no tappings are required, there is nothing to limit the length of bell cable between boxes except for the convenience in replacing a damaged portion. In the case of the South Rand shaft, where no bells are required between the surface and a depth of 2,000 ft., pockets are cut in the rock to provide dry places for junction boxes at depths of about 800 and 1,000 ft., so that in case of a failure it will probably not be necessary to replace a greater length than 800 feet.

Power Cables in Shafts.—The power cables at the Crown Mines are 2,200-volt, 3-phase, 3-core, paper insulated, lead covered, steel-armoured, and jute-covered cables. The cross-section of each copper core is from 0.1 to 0.2 square inch, depending on the load to be taken care of. Where the larger size is not sufficient to carry the load. additional cables are installed, as it is not economical to increase the size of such a cable much above 0.2 sq. in. These cables are specially made for shaft work, and do not contain any free oil, otherwise the lead might be ruptured by the static pressure of the oil. Here again the length between the boxes is determined largely by the idea of replacement in case of failure. The longest length on Crown Mines is about 1,000 feet.

Installation.—Neither the bell nor power cables referred to above are able to carry their own weight for any great length. They are lashed or clamped about every 70 ft. to a wire rope when being lowered into place. The lashings or clamps are gradually removed as the cables are cleated to the shaft timbers.

The Lane Slow Speed Chilian Mill.

A type of machine that has many credentials as an ore crushed is the Lane Slow Speed Chilian Mill, which, as has been stated in a previous issue, has been installed with success at a gold mine in Zululand. A machine was erected some time ago at the Stanhope, but the results appear to have been influenced by so many circumstances of an unfavourable and abnormal kind that they would be hardly worth while quoting here, even if available. It is interesting to learn, however, that this machine has been purchased for a mine in the Lydenburg district, the owner of which considers that he has secured the right kind of crusher for the work required in that part of the country. The following description, from a paper by Mr. J. McDermott, Sen., of work done in Western Australia will give some idea of the capabilities and advantages of the mill:—

An ore-bin with a capacity of about 40 tons has been erected, at a sufficient elevation to allow the ore to gravitate into a belt-driven ore-feeder, and from which the Lane Mill is automatically fed into its central hopper. An amalgamating table has also been attached to the mill. In commencing actual crushings and treatment operations with the mill and plant, run of mine ore from the Princess Royal mine was hand-fed into the rock breaker, where it was reduced to about 1 in. or 1¼ in. ring, and then simultaneously elevated to the ore-bin at an elevaition of about 35 ft. The ore then gravitates and is automatically fed through a belt-driven ore feeder to the central distributing hopper of the Lane mill, from which it is delivered, together with the water, by six steel troughs, on to the track behind each roller. Steel levellers are provided to adjust and retain an even thickness of ore between the rollers and the track, where it is subjected to a crushing and grinding pressure of about twelve tons at a speed of about eight revolutions per minute. The Princess Royal ore is a quartz above the average hardness, and this was reduced so that practically the whole passed a 40-mesh at the rate of 40 tons per 24 hours. The value of the tailings shewed only 6 grains per ton, whilst the lowest assay of battery tailings was 1 dwt. 20 gr. per ton. This shows an extra saving by the Lane mill of 6s. 6d. per ton, and the loss in quicksilver to be practically nil. Owing to the tardy development of the Princess Royal mine. and in consequence of its failure to keep the mill supplied with sufficient ore, I decided to run the mill upon any customs parcels offering, thereby subjecting same to the most rigorous of tests. The nature of the customs parcels of ore treated varied in character from pugg schistose formation to quartz, ironstone and jasper formation, and the mill treated all with highly satisfactory results. The sieve tests upon these Lane mill tailings prove that no less than 90 per cent. passed through a 100-mesh screen. It is therefore very evident that by passing such a product through a screen and automatically returning the comparatively small amount of "over-size" to the mill for further comminution a tube mill or all-slime product could be obtained if required, with but little reduction in the capacity of the mill. The following tests will demonstrate the fineness of the pulp from the Lane mill, the product of which is found to be much more even in grain and gravity than that obtained from a battery, and in consequence it is in a far superior condition for sizing, concentration or cyaniding treatment when necessary. Amount of pulp passed a 40-mesh screen, 99 per cent.; amount of pulp passed a 60-mesh screen, 96 per cent.; amount of pulp passed an 80-mesh screen, 91 per cent.: amount of pulp passed a 100-mesh screen, 90 per cent. As demonstrating the amalgamating properties of the Lane mill, it is highly pleasing to know that 98.28 per cent. of the amalgam saved from the sulphide-test parcel referred to was taken from within the mill itself with but 1.7 per cent. from the outside plates, and the average for the whole of our crushings has been 94 per cent. from within the mill and 6 per cent. from the outside plates. As denoting the cleansing action of the Lane mill upon the gold, it is worthy to note that upon the sulphide test referred to the battery returned 15 per cent. of the smelted gold, and the Lane Mill 52.24 per cent., whilst the average for the whole of our amalgam has been no less than 53 per cent. This is far in excess of that obtained in any stamp mill. It is also a significant fact that upon several parcels of ore treated by the Lane mill, the mint returns of the bullion show an enhanced value of from 3s. to 5s. per ounce over that obtained from stamps upon the same ore. This is probably attributable to the abrasive action of the mill upon the ore, and to the extra saving of the extremely fine gold. The power required to drive our ten-foot Lane mill with full load running on ore of 1½ in. ring, does not exceed 8 B.H.P. It is, therefore, less than one-quarter H.P. per ton of ore milled. It is evident, however, from E. E. Carter's ammeter tests, which are referred to in press reports, that when the ore is fed at 4-mesh, only 5 B. H. P. is required. It is easy to understand why this should be so, for the reason that it is much easier to draw a loaded wagon over a smooth road than over a rough road. Taking the power required to drive a ten-foot Lane mill with a capacity of 40 tons per 24 hours at 8 B. H. P., it will at once become apparent that an enormous saving has been effected in this important direction, as against stamps of similar capacity, which would require about 30 B. H. P., and even then the product from the Lane mill would be considerably "finer" than that produced by the stamps. The amount of water required in the Lane mill in order to convey the pulp out of the mill on to the outside plates would be quite one-third less than that required for a stamp battery of similar capacity. This feature will often be much appreciated in dry places. It is at once apparent that the greatest amount of wear and tear will be confined to the chrome-steel tyres and the manganese steel track, and outside of which the wear and tear will prove infinitesimal, this being due to the slow speed and even running of the mill. Although it is somewhat premature to furnish exact figures in connection with this item, until the above spares require replacing, sufficient crushing has been accomplished, however, to demonstrate conclusively that when running upon fair average quartz the wear and tear should not exceed twopence per ton of ore milled, and considerably less upon many lode formations. This shows a considerable and important saving when compared with stamps, which cannot be estimated at less than sixpence per ton.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

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Finance, Commerce, and Industries.

A Short Course in Agriculture, etc.

The attention of those interested is called to the notice of a short course of instruction upon agriculture and live stock, veterinary science, agricultural engineering, dairying, poultry, horticulture, agricultural botany, agricultural chemistry, agricultural zoology and entomology, that will be given at the School of Agriculture at Potchefstroom shortly. The course will begin on the 10th August and end on the 8th October, and full particulars are obtainable on application to the principal.

* * * *

Prize Essays on Irrigation.

The South African Irrigation Association is announcing a most interesting competition. Apparently with the object of discovering and encouraging local talent, it is offering a prize of £15 for the best essay to be compiled under the following heading: "The Distribution of Water." The essay has to show the most effective methods of distributing water over land, for the profitable production of crops under irrigation, and to have regard to (a) the character of the water supply; (b) the character of the soil to be irrigated; and (c) the surface conditions and slope of the land These details should be sufficiently explicit to guide any one of experience in the compilation of an essay of this description, and considering the scope of the subject we may anticipate some exceedingly valuable papers, only provided that the right people enter the competition. The prize essay, and possibly some of the best of the others, are, we understand, to be submitted to the annual congress which will meet in the second week in October at Oudtshoorn.

* * * *

B.E.A. Prospects.

Messrs. Bowker & O'Meara, Land and Estate Agents, write to us from Nairobi, B.E.A., as follows:—"This country is attracting a great deal of attention, and intending settlers are arriving in numbers weekly from all parts of the world, on account of the excellent prices realised by some of our products on the European markets. Flow of capital is steadily on the increase and numerous companies floated to handle the proved products, and a big number of farms changing hands at fair prices, but in no cases are the prices exorbitant. Taking good coffee soil at £5 per acre returning a crop in a few years valued at £30, must be considered very reasonable. Wattle with better tannin results than Natal, and in parts at least capable of being stripped a year earlier and also local demand for timber as fuel. land stands at 10s. to £2 per acre, and about same for sisal. Sheep and cattle veldt of the best at 10s. to £1; it must also be borne in mind we have two distinct rainy seasons, thereby allowing a greater number of stock to be run per acre."

* * * *

Union Finances.

During the closing hours of the Parliamentary session last week, Mr. Merriman drew the attention of the House and the country to "the most serious position of the finances." General Smuts, he declared, was making "a frightful mistake." He pointed out that the bewaarplaatsen revenues could not be taken into account, as they ought to be in a separate fund. The real position at which he arrived was that the revenue would amount to £16,101,000, against which there is an estimated expenditure of £17,125,000, or, in other words, the Minister of Finance was budgetting for a deficit of £1,020,000. This, said Mr. Merriman, in a startled House, was an unheard-of state of affairs. Next year the railway contribution would come to an end, and on the same basis there would be a deficiency of £1,520,000. The most careless must pause in face of such a situation. In making this calculation Mr. Merriman was, of course, ignoring the £855,000 which remains over from 1910-11, but looking at the position from every point of view, Mr. Merriman found nothing but gloom. Sir Edgar Walton added a few words by way of throwing further light on the situation and arrived at the conclusion that if the bewaarplaatsen proceeds were deducted there would be a deficit of £335,000, after taking into account the balance from 1910-11. "A nominal deficiency," said General Smuts uneasily. Mr. Fremantle joined in the denunciation of Ministerial finance, pointing out that if the Public Accounts Committee's recommendations were approved, it would not be possible to take into general revenue the whole of the balance from the year before last, as much of that was money which ought to be applied to sinking fund purposes. General Smuts, in his reply, recognised the gravity of the situation, and declared that it had always been recognised, and that Mr. Hull himself had predicted additional taxation next year. He undertook, as long as he remains at the Treasury, that the finances shall be conducted on the most economic lines possible.

* * * *

Netherlands Bank.

The abridged report for the year 1911 of the Netherlands Bank of South Africa, submitted to the ordinary general meeting of shareholders on the 14th May, 1912, states:—The result of the bank's operations during the year under review is satisfactory, as shown by the increase in the profits made both in South Africa and Europe, as compared with those for the year 1910. The result is a reflection of the steady progress in general which has been made in South Africa during recent years. The import and export returns for the year 1911 again show an improvement on those of the previous year: 1910 (imports) £35,123,644 (exports) £54,509,270: 1911 (imports) £36,423,539, (exports) £57,734,875. Nevertheless the progress of the country has been handicapped by the scarcity of native labour. The producing gold mines experienced very great difficulty in securing an adequate supply of labour for their requirements and therefore, notwithstanding the persistent efforts which have been made during recent years, the long-desired decrease in working costs did not materialize. Agriculture further suffered from the long drought. This specially affected the growth of mealies the export of which consequently decreased from £704,876 in 1910 to £419,531 in 1911. It is not improbable that the consequences of this will be shown in the trade returns for the current year. Your Directors therefore think it prudent, notwithstanding the increase in the profit, to recommend to you the declaration of a dividend at the same rate as last year. After fully providing for bad and doubtful debts and setting aside a substantial amount for depreciation of bank premises and furniture, the net profits for the year, including the balance of £686 11s. 10d. brought forward from last year, amount to £16,689 12s. 7d. (*f*200,275.56), which the Directors recommend should be applied as follows:—Dividend of 4 per cent. on subscribed capital, £9,600; transfer to Reserve Fund (making it £24,000), £4,000; transfer to Special (Internal) Reserve in South Africa, £2,400: balance carried forward to next year, £689 12s. 7d.

* * * *

New Tram Cars.

At the meeting of the Johannesburg Town Council this week the following urgency recommendations of the Tramway Committee were agreed to: (a) That the tender of Messrs. Dick Kerr & Co. for the supply of the truck and electrical equipment for ten double-decked bogie cars, in accordance with the specification, at a price of £513 10s. per car, be accepted. (b) That the tender of Messrs. Blane & Co. for the supply of ten car bodies of the Brush Company type, in accordance with the specification, at a cost of £710 per car, be accepted, provided the tenderers are prepared to reduce the length of the car to a maximum of 35 feet without reducing the carrying capacity below 74, and provided further that they are prepared to erect the cars in Johannesburg at their tendered price for erection of £44 10s. per car. (c) That the sum of £3 16s. and £3 5s. for extras per car respectively, quoted by Messrs. Blane & Co. be sanctioned.

Fresh Fruit Trade. In the course of his annual report for 1911, the Trades Commissioner in London writes:—My annual report on the fresh fruit export trade for 1911 will now cover, for the first time, fruit shipped from all ports of the Union. I do not include citrus fruit, as this subject will be dealt with in a separate report. I was very glad to notice small trial shipments of plums from Natal, apples from the Orange Free State, mangoes from the Barberton District, as well as excellent grapes and a few experimental shipments of apples from the midland districts of the Cape Province. The following figures show the total number of boxes of fruit exported *during the seven years up to* 1905:—1899, 10,817; 1900, 17,336; 1901, 17,265; 1902, 14,998; 1903, 21,968; 1904, 34,723; 1905, 23,832. The undermentioned figures show the quantities of each class of fruit from the Cape Province for the past five years. The figures for 1911 include the total shipments of fruit from all Union ports:—Peaches (1910) 23,616, (1911) 27,800; pears (1910) 98,704, (1911) 62,067; plums (1910) 25,025, (1911) 47,560; nectarines (1910) 2,581, (1911) 3,863; grapes (1910) 46,806, (1911) 86 030; melons (1910) 750, (1911) 1,134; apricots (1910) 3,383, (1911) 8,121; apples (1910) 90, (1911) 118; pines (1910) 835, (1911) 8,173; mangoes (1910) —, (1911) 513; sundries (1910) 51, (1911) 170; totals (1910) 201,871, (1911) 215,549. South African fruit is now becoming more generally known throughout the markets of the British Isles and the chief centres on the Continent of Europe. These markets are being steadily developed. It has generally been thought by persons who have not made a careful study of the requirements of those markets that they can take large quantities of fruit straight away. This is an erroneous idea; there were a great many obstacles to overcome and problems to be solved, such as cheap and efficient means of transport, etc. These, to a great extent, have now been overcome by the rearrangement of the classification of South African fruits in the English railway tariffs and the arrangement of more expeditious routes for the Continent in conjunction with the arrival of the steamers carrying South African fruit, and the quick dispatch of the fruit from Southampton to Hamburg via Grimsby, these facilities having been arranged on representations from this Department. The condition of the fruit on arrival on the Continental markets is now much improved, and the prices are consequently better, while the demand is steadily increasing. Shippers can rest assured that everything is being done to develop these markets; their agents here are well acquainted with the requirements and take full advantage of those markets for the sale of fruit entrusted to their charge. I would recommend shippers not to consign fruit direct to Continental markets without advising their London agent. I think shippers would do well to leave matters concerning the redistribution of fruit to both Continental and American markets to their representatives here. Consignees of South African fruit who have made arrangements for the transhipment of portions of their consignments to the Continent have complained that they cannot get such lots out in time for the special train leaving Southampton for Grimsby at 9.5 a.m. As the ship starts discharging the fruit at 5 a.m. and does not finish a large shipment until about noon, it will be obvious that unless shippers arrange to have a certain portion of their fruit stowed in the cool chamber, which could be opened first, and advise their agents accordingly, it is doubtful whether the consignments for Hamburg can be got out in time for the Grimsby train. As the advantage taken of this train has proved of great benefit to the South African fruit trade, I would urge shippers to facilitate matters by carrying out this arrangement. It must be further pointed out that the White Star liner for New York leaves Southampton Docks at 12 noon, and that agents are anxious to take advantage of her for the shipment of their American consignments. I have dealt fully in my previous annual reports with the questions of packing and grading, the most suitable varieties to grow for these markets, and with matters of refrigeration and transportation, and costs of shipping the different varieties of fruit. As most of these matters are now being better understood and considerable improvements have been effected, I do not feel justified in repeating my remarks in this report. But should new shippers desire this information, they shiuld write to the Agricultural Department for my Annual Fruit Reports of 1909 and 1910. I cannot, however, refrain from reminding growers and shippers of the important points necessary to firmly establish this trade on a sound and profitable basis, which will command the respect and patronage of dealers and consumers alike:—(1) Continue to acquire knowledge in connection with this trade. (2) Send only your best fruit to this market. (3) Give your personal attention to the grading, packing, and transportation. (4) Study the wants of the markets as to varieties and qualities, and send only what the markets require. (5) Study your farm, the habits of your trees, and the keeping qualities of the fruit from the different parts of your land grown under different condition. (6) Aim at the further development of the trade in the large commercial classes of fruits, such as apples, pears, oranges, Almeria grapes, and also pines. In regard to the pears, in so far as quality and condition on arrival are concerned, we are already well ahead of any other country shipping this particular fruit to this market, and there is no reason why we should not do likewise with the other fruits mentioned. All these fruits can be grown, and we must learn what varieties the markets want and how to ship them.

* * * *

Railway Returns. The traffic earnings of the South African Railways for the week ended the 22nd of June show an increase in every department. The outstanding figures are those of goods and coal. The former has risen from £104,763 to £110,794, and the latter from £38,516 to £40,818, while livestock also registers a sum well above the ordinary. The increase as compared with former ones of recent weeks is above the average. Passengers show an advance of £136, the two figures being £66,337 and £65,473. The total earnings are £237,866, an increase of £10,655.

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Steel Water Pipes.

At the Port Elizabeth Town Council last week, it transpired that over a mile of the large steel pipe main from the waterworks, which was laid down about five years ago, has become eaten away with rust, and will need to be replaced with a cast iron pipe at a cost of £3,500. When the new waterworks were undertaken some seven years ago, the town saved something like £12,000 by using steel instead of cast iron pipes. Grave fears, however, are now entertained as to the wearing qualities of steel pipe, and the Council to-day instructed the Town Engineer to excavate the pipe line at various points with a view to ascertaining the condition of the pipe. If the remainder of the pipe has worn no better than the mile in question, it will practically mean the relaying of the whole main, involving the town in enormous expense. The Engineer stated that he understood that steel pipes had also been causing trouble at other centres.

* * * *

An Important Commission.

A Commission has been appointed by the Governor-General of Delagoa Bay to enquire into and report upon the following matters:—(1) To define the relations between the Port Captain's Office, the Customs, and Port and Railway, with a view to maintaining, in a more approved manner, the joint working of these departments; (2) To reorganise the Port and Railway services, and to frame up-to-date regulations in connection therewith; (3) To report on the claims put before the Governor-General by the Association of the Port and C.F.L.M. employees. The Commission is composed of the Secretary General (President), the Chief Engineer of the Harbour Works (Secretary), the Port and Railway Director, the heads of the different Railway Departments, the Assistant Engineer of the Wharf Power Department, the President of the Port and C.F.L.M. Employees' Association, Mr. A. de Carcalho, Mr. E. de Freitas, with the Port Captain and Director of Customs to draw up the report.

* * * *

Railway Profits.

A return of the working of the South African Railways and Harbours for the financial year ended 31st March last has been prepared, and published as a white paper. The figures presented may be roughly summed up by saying that in regard to railways the Minister is nearly a million pounds to the good on his estimates of revenue, and nearly two-thirds of a million to the bad on his estimates of expenditure, the net result being to leave him a third of a million sterling (to be precise, £344,795) to the good; while the actual revenue of the harbours for the year shows an excess of £44,593 over his estimates, and the actual expenditure an excess of £8,330, leaving him another £36,000 better off than he anticipated. The gross earnings of the railways, exclusive of the subsidiary services, amounted to £12,199,337, which is in excess of the estimates by some £896,581. The estimates were exceeded under all the principal sub-heads, but the largest gross and proportional excess is in regard to passenger traffic, which the Minister under-estimated by just upon £400,000, or 14·5 per cent. on his estimate. Earnings on the carriage of coal have exceeded his expectation by £203,000; on goods and minerals other than coal by £249,000; on livestock by £54,000; and on parcels by £15,000. The only sub-heading in regard to which the Minister over-estimated the revenue is "miscellaneous traffic receipts," which have fallen short of his reckoning by £24,000.

* * * *

Details of Railway Rates Reductions.

The following are details of the reductions in railway rates to be given effect to on and after the 30th of July next, as announced by Mr. Sauer in the House of Assembly this week:—

South African coal, clay, earth, earthern pipes and tiles, bricks, native timber, limestone, and other minerals, £303,000. Examples: From Witbank to Johannesburg, 1s. 6d. per ton; Witbank to Kimberley, 7s. 3d. per ton; Witbank to Bloemfontein, 6s. per ton; Witbank to Capetown, 31s. 9d. per ton; Glencoe to Kimberley, 9s. 6d. per ton; Glencoe to Capetown, 29s. 4d. per ton; Coalbrook to Kimberley, 4s. 8d. per ton; Coalbrook to Capetown, 25s. 1d. per ton. Maximum rate for any distance, 17s. 6d. per ton. A rebate on coal shipped oversea of 1s. per ton (this rebate will not be allowed on bunker coal), £20,000. Reductions in charges in shunting services at private sidings. This alteration will afford substantial relief to private sidings holders, except in Natal, where little or nothing has hitherto been charged for services rendered, £50,000. Live stock. Rates for sheep and other small animals will be reduced by 1s. 7d., £30,000. South African cement: Substantial reductions will be made which will enable South African cement to compete successfully with the imported article as far down as 200 miles from the several ports, £12,000. Grand total, £415,000. The following reductions are postponed, pending settlement with the Portuguese Authorities:—South African wagon wood and rough imported timber reduced by 14s. 2d. per ton to Johannesburg. £95,000; planed imported timber (including ceiling and flooring boards) reduced by 24s. 2d. per ton to Johannesburg, £32,000; doors and windows and frames thereof, paraffin oil, tram rails and accessories for agricultural and industrial purposes are reduced by 29s. 2d. per ton to Johannesburg, £37,500 Galvanised iron (packed) reduced 27s. 6d. per ton to Johannesburg, £30,000; imported cement reduced by 14s. 2d. per ton to Johannesburg. £12,000; agricultural and dairying implements and machinery reduced by 35s. 10d. per ton to Johannesburg: Windmills reduced by 60s. 10d. per ton to Johannesburg. £36,000; fencing materials reduced by 5s. 5d. per ton to Johannesburg, £7,500. Revision of port rates (tariffs 3 to 13 inclusive). This revision would have removed certain anomalies and inequalities in rates and at the same time would have afforded reductions in rates for all articles in tariffs 3 to 13. Examples with reductions to Johannesburg per ton: Class 3, all articles, including jams, preserves, candles, plaster of paris, gases in tubes, hops, bar and rod iron and steel, 14s. 2d.; class 4, all articles, including asphalte, empty bags, trade vehicles, rough iron, printing paper, 14s. 2d.; class 5, all articles, including bottles, jars, boxwood, hooks, 12s. 6d.; class 6, all articles, including raw materials for manufactures, spraying materials, sheep dip, 5s. 10d.; class 8, all articles, including return empties, farm seeds, sheep dip, cattle food, malt, 15s. 5d., £85,000. Grand total, £335,000.

* * * *

Cotton.

According to the half-yearly report of the German Colonial Economic Committee, the cultivation of cotton in the German African Colonies is making steady and satisfactory progress. The 1911-12 crop represents 7,500 bales of 250 kilograms, of which 5,000 were produced by the East African Colony and 2,500 by Togo. The total value of these crops is estimated at 3,000,000 marks. Since the Colonial Administration took in hand the organisation of cotton cultivation, no less than three stations have been established in German East Africa, which are devoted to experimental work on a scientific basis, especially in the selection of seed and grappling with the important question of parasites. The two stations in Togo are also working on the same lines. The efforts made to render German East Africa independent of abroad for the supply of cotton seed appears to have met with success. The authorities have started an establishment at Dar-es-Salam for the preparation and selection of seed for sowing. For the current year the committee has 210,000 marks at its disposal, which it can use for the encouragement of cotton growing, 80,000 marks of which have been contributed by the German textile industry. In addition to this, various new cotton undertakings are in course of formation.

Pretoria Portland Cement Co.

An interim dividend (No. 9) of 20 per cent. (4s. per share) has been declared, payable to shareholders registered in the books of the company at the close of business on June 30, 1912.

Sale of Mining Plant.

Notice of a sale of mining plant lying at the King George Gold Mining Company's property, near Frederikstad, appears in another portion of this issue. The sale takes place at Potchefstroom on Saturday, the 6th July.

Dundee Coal Co.

An an extraordinary meeting of shareholders in the Dundee Coal Company, held last week, it was decided to reduce the nominal share capital of the company from £300,000 to £100,000. The Chairman stated that this action was taken in view of the fact that it had been decided to close down the old Dundee mine, which was the first colliery established in Natal.

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TRANSVAAL
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2. **TRANSVAAL** Mines have spent 24 millions sterling on machinery and plant.
3. The **"South African Mining Journal"** is the **Official Organ** of the **Mine Managers' Association.**

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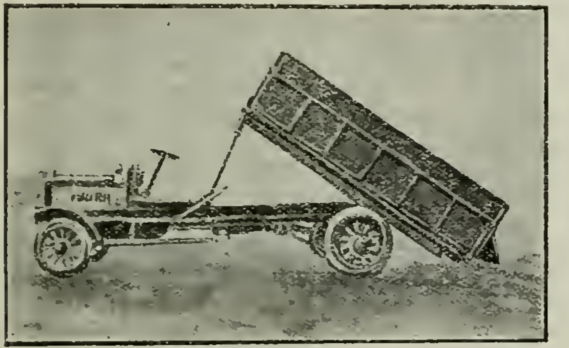
ADVERTISEMENT RATES ON APPLICATION

Automobile Notes.

The Petrol Motor.

The value of the petrol motor, and the uses to which it may be applied are daily becoming more apparent in many parts of South Africa. The motor road-roller, for example, has been in use in one of the coast towns for some considerable time past, and it is expected that Johannesburg will, at no distant date, follow the lead in this enterprising and commendable respect. Mention was made some little time ago of the Municipality's decision to employ motor traction in the important work of scavenging, and it is gratifying to report that this week the first of a consignment on order of motor tip wagons was put into commission by the Department responsible for the cleanliness of the city. The tractor is of the famous Lacre type of some 4 tons, and is a distinct improvement on the familiar steam wagon types in general use in most European cities. These motor-tip wagons have been specially built to the order of the Johannesburg Council, and combine simplicity of detail, maximum strength, ample engine power to negotiate the steepest hills without faltering, and in lending themselves to perfect ease of control in congested traffic, such as is typical in Johannesburg, apart altogether from the question of economy, their introduction to these parts is evidently justified. They are fitted with a specially designed end-tipping gear, the system of operation which will be seen in the accompanying illustration. The important part which motor traction is destined to play in the future development of this country is being fully recognised by many British manufacturers, who, it may be said, up to a few years ago, had not given very serious attention to the design and construction of the internal combustion-engined tractors. To-day, however, many concerns specialise exclusively in this particular branch of the motor industry, and make and erect agricultural tractors for ploughing, clod-crushing, cultivating, threshing, hauling, and, in fact, all features of farm work are studiously specialised, in order to meet the ever-increasing demand at home and overseas. These vehicles of the Colonial type are constructed to withstand the very roughest work of arid countries, and will work equally well with paraffin or petrol, and in addition are designed to carry sufficient fuel and cooling water for extended runs.



PARSONS NON-SKID CHAINS

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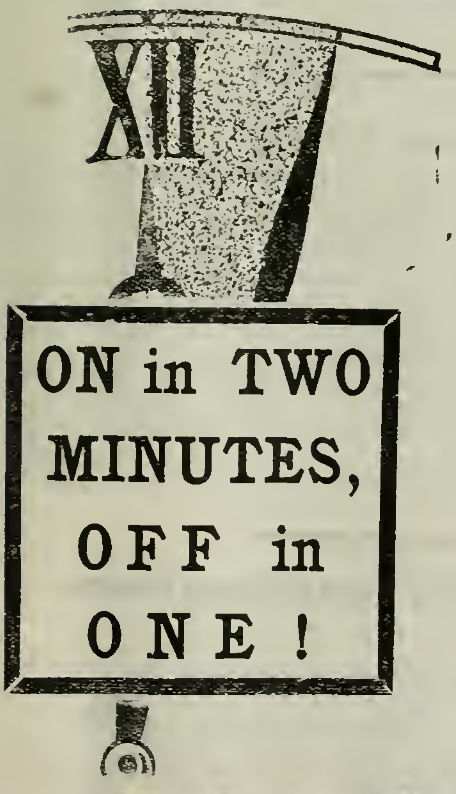
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Parsons Non-Skids will take you over ANY road surface, sand, mud or grass; they cannot damage or heat the tyres, and they give the maximum tractive grip under all conditions.

Extensively used in South America and Australia. 408,694 were sold in the United States of America alone during last year.

PRICES: For Tyres 760 mm. or under, £3 per pair.
,, ,, 800 mm. to 920 mm., £4 per pair.
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THE PARSONS NON-SKID COMPANY, LTD.

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E.H.G.

The American Car.

The market offering in almost every country of the world for the American car is once more forcibly brought into prominence by some recent statistics, which show that the exports of motor cars from the United States in 1911 were valued at £4,327,332, as against £2,800,000 in 1910, while on the other hand it is significant of the prohibitive nature of the tariff on imported vehicles to that country that these showed an appreciable tendency to decline. Strange to say, a British possession, namely, Canada, last year absorbed almost one-third of the States' entire export trade in motor vehicles, which was represented by over £1,400,000. Were Britain and her dependencies to impose a tariff consistent with that exacted by the United States, the threatened, or rather the actual, American car invasion would soon cease to be so pronounced. The remedy, it would appear, lies with the British manufacturers, who should combine, and petition for a more substantial duty on American imported vehicles, and until a measure of this nature is put into effect, much of the motor trade will be assured the United States.

The Grand Prix.

On the 25th and 26th inst. the attention of the entire motoring world was directed to that part of France where the famous Grand Prix race was being contested. The course is triangular in shape, and, roughly, 48 miles in extent, over which many cars were expected in places to career at 100 miles per hour. Elaborate precautions were observed to ensure the safety of competitors and spectators alike during the progress of the great race, which, by the way, entailed covering some 1,200 miles; barricades were erected at all necessary places, with troops and police on duty at the various points on the course where any risk was involved. As is well known, British and other manufacturers have been vieing with each other in regard to this searching contest, as a glance at the relative nationalities of the competing cars will show. On the date for the closing of entries, 58 cars had signified intention to compete, 36 being supplied by France, 15 were of British origin, three Italian, and on each from America, Germany, Switzerland, and Belgium. So far as British cars were concerned, the Vauxhall and Sunbeam are considered by the Continental "cracks" as their most dangerous opponents, and the latter, according to the cables, went very near winning.

One of the "Sunbeam" Fleet, driven in the Grand Prix.

The Trained Chauffeur.

The specialised chauffeur is undoubtedly a totally different product to the transformed coachman, so much in evidence in Johannesburg, and may be expected to keep his employer's car up to concert pitch. He will never evince a weakness for joy riding, for example, indulged in by so many, and, in short, may be depended upon to render an all-round satisfactory service to his employer. The attention which a car requires is of vital importance, and it naturally should not be left to the tender mercies of the "boy," as is so often the case, for, while admitting the reliable qualities of the present-day car, the lack of regular and experienced attention will sooner or later involve dire results. Those in a position, however, to employ a chauffeur should never permit the inclusion of other duties, relative to the household, which are so strongly resented by the self-respecting person, to interfere with his specific duties. Treat the chauffeur fairly by recognising the responsibility of his profession, which requires a constant exercise of alertness and other qualities, and your car will be found to run better, cost less, and if eventually for disposal, will reflect handsomely the specialised treatment it has received at the hands of the well-treated chauffeur. In many instances the proprietor of a garage where a car may be stored, or periodically overhauled, knows the owner merely in nominal fashion, all responsibility in regard to the car being deputed to the chauffeur. How far this can be approved of is a moot question for the owner himself to decide. Should an owner, at any time, have occasion to suspect his man of joy-riding, or some such reprehensible conduct, he can easily determine the matter by matching the petrol consumption of his car by the mileage records, when discrepancies will be unearthed. Blame in this connection is, however, often laid at the doors of the garage proprietors, some of whom, by the way, are not altogether averse to joy-riding. At all events, it would appear that a better condition of affairs than exists would be forthcoming were car owners to take more largely into their confidence, with a view to a definite understanding, the garage men who undertake the overhauling and other work in connection with their machines.

The Reyersbach Trophy.

The race for the Reyersbach Trophy will be robbed of much of its interest owing to the fact that no Vauxhall car has been entered for this event, in which speed is the determining factor. The usual well-known drivers are participating, and from what one can gather the honours will fall to either the Austin, Sunbeam, or Talbot cars, all of which will be "all out" in this particular contest. The event has aroused much interest in local motoring circles, and visitors to Baragwanath are promised a good time, as this race will be responsible for a keenness of competition more or less absent in similar events in the past. The race, as previously announced, takes place on the 30th inst.

Union Finances.

The Railway accounts for April were gazetted this week as follows:—Earnings, £1,012,263 13s. 9d.; expenditure, £616,130 11s. 7d.; leaving £426,133 2s. 2d. to be carried to the net revenue account. Harbours showed a transfer to net revenue of £10,741 1s. 5d., whereas the interest on loan capital was £31,077 15s. 4d. The exchequer receipts for April and May, 1912, show a total of £2,395,805 17s. 10d., as compared with £2,692,040 7s. 1d. for the same period last year. Loans raised (Treasury Bills) total £2,159,000, as compared with £1,231,506 5s. for April and May last year. Issues total £2,936,421 on the revenue account, and the issues on the loan account bring the total to £3,173,924, with an additional £2,000,000 "temporary loans repaid."

ANSWERS TO CORRESPONDENTS.

"S. W." (Kilburn, London).—Your letter has been forwarded to the Town Clerk, Pietermaritzburg.

"A. S. C."—In liquidation—nothing for shareholders.

"Mossop" (Capetown).—The answer to both your questions is in the negative.

The Week's Company Meetings.

ROBINSON DEEP.

Mr. Chaplin's Review.

Successful Year's Working.

Bonus and Increased Dividend.

Future Policy Outlined.

The annual general meeting of shareholders of the Robinson Deep G.M. Co., Ltd., was held last week in the board-room, Consolidated Gold Fields Buildings. Mr. F. D. P. Chaplin presided, and the other shareholders present were: Messrs. F. L. Brown, J. E. Kent, D. W. Rossiter, W. S. Smits, M. Dold, C. Davies, J. Berry, H. H. Oldroyd, E. Bell, and J. D. Low, secretary.

There were represented personally and by proxy 336,174 shares out of the issued capital of 1,000,000 shares.

Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: On reference to the expenditure and revenue account you will see that the profit from working operations for the year, which ended on 31st March last, after allowing for an expenditure of £13,125 on renewals and replacements of plant and machinery, amounted to £434,493 16s. 10d. In addition there was £6,686 10s. 10d. derived from interest received and sundry revenue, the result being that after providing for profits tax and sundry amounts written off, a balance of £403,673 11s. 9d. remained to be carried to appropriation account. This amount, together with the balance brought forward from last year, viz., £136,969, and a refund of £825 received in respect of our holding of 6s. shares in the Witwatersrand Native Labour Association, Limited (previously Chamber of Mines Labour Importation Agency shares) which had been written off, made a total credit to appropriation account of £541,467 19s. 5d. Out of this sum two dividends of 15 per cent. each, and a bonus of $2\frac{1}{2}$ per cent. were paid during the year. which absorbed £325,000. £25,970 13s. 3d. was transferred to credit of the additions and renewals fund, details of which are fully set out in the accounts, and £63,998 was appropriated on account of the payments accruing to Government in respect of the water-right claims, and a balance of £125.794 was carried forward to next year.

Increased Profit.

As compared with last year the profit on working shows an increase of £84,855, which is accounted for partly by an increase of .106 dwt. in the grade per ton of the ore crushed, while there was an increase of 60,950 tons in the tonnage crushed, and working costs were reduced to 17s. 7.182d. per ton, as against 18s. 11.133d. last year. This increased profit enabled your directors to raise the dividend rate for the year, which, together with the $2\frac{1}{2}$ per cent. bonus paid, gave you an additional return of 5 per cent. as compared with the previous year.

Accounts.

Turning now to the balance sheet and dealing first with the principal items on the credit side, it will be seen that property account shows an increase of £289,980, being the purchase price, in ten annual instalments of £28.998 each, in respect of the water-right claims acquired from the Government, details of which have been conveyed to you in previous reports. Expenditure on equipment and shaft sinking has increased by £22,816, as fully detailed in the table of capital expenditure accompanying the accounts. Cash on special deposit account and interest accrued to 31st March last, £35,337, I will deal with later. Plantation account has risen by £829, due to additional trees planted during last rainy season. Stores on hand show an increase of £519, accounted for by increased stocks of certain materials which it has been decided to carry as a safeguard against industrial disturbances in Great Britain. Share investments and interest in other concerns show an increase of £11,925. principally due to the acquisition of 9,050 shares in the Breyten Collieries, Ltd., which company, it is hoped, may reach the dividend-paying stage before very long, and an interest in the Consolidated Gold iFelds Native Labour Organisation.

On the debit side, capital remains unaltered. Amounts appropriated out of profits for capital expenditure show an increase of £78,151 comprising the appropriation of £63,998 in connection with the water-right claims and the additional expenditure on equipment to which I have already referred.

Government of South Africa Annuity account, £260.982, represents nine annual instalments of £28,998 still due to Government in respect of the water-right claims. These instalments fall due on the 30th September each year, and since the 1st September last £5.000 per month has been set aside out of profits, and invested under a special deposit account with the company's bankers. The amount so accumulated, together with interest, was, at the 31st March last, £35,337. Reserve for additions to and renewals of machinery and plant has increased by £3,860, being the difference between the amount transferred from appropriation account and £22,110 expended on additions during the year. Gold in reserve shows an increase of £8.098.

Ore Reserves.

As the report of the acting superintending engineer shows, the latest estimation of the ore reserves indicates that there were, at 31st March, fully developed some 1,141,000 payable milling tons of an average assay value of 7 dwts., as well as some 83,000 payable milling tons of an indicated value of 6.7 dwts. in areas partially developed. These figures, which do not include any tonnages or values of the ore in the water-right area acquired from the Government, compare with an estimate of 1,140,000 payable milling tons of an average assay value of 7.2 dwts, and 86,000 tons, valued at 6.65 dwts. in areas partially developed, given in the superintending engineer's report last year. In view of the slight decrease in values, thus anticipated, and on the adoption of the policy already described of working out as rapidly as possible the richer water-right area, your directors have had under consideration the desirability of somewhat increasing the capacity of the reduction plant. The success which has attended the working of the small drills, to which I have already referred, apepars to reduce the risk of finding the labour supply insufficient to provide the additional tonnage, and as in any case somewhat extensive reconditioning of the stamps had become necessary, it was, after careful investigation, decided at once to reorganise the crushing plant on modern lines of economical and efficient operation, and to bring the capacity of the mill, calculated with a view to the best possible results, up to 60,000 tons per month, an increase on the previous capacity of about 9,000 tons.

More Tube Mills.

The advances adopted in coarse crushing and amalgamation practice have mainly been rendered possible by trials carried out on the other mines of the Gold Fields group, especially the Knights Deep, and referred to in the Consolidated Gold Fields annual reports for 1910 1911.

Satisfactory Year.

You will see, therefore, that on the whole the results for the year have been satisfactory. Though we have had less native labour at our disposal, the tonnage crushed has been increased from 533,850 to 594,800 tons, and the working profit from 12s. 6.325d. to 14s. 3.647d. per ton. This has been achieved partly by the increased efficiency of the employes, both Europeans and natives, and by the continued success which has attended the employment of the small drills, to which reference was made at last year's meeting, 480.862 tons, or 68.84 per cent. of the total tonnage hoisted. having been broken by machines, and. as you will see from the manager's report, it is hoped that during the current year the services of the small number of hammer boys still employed will be dispensed with, and this work entirely done by small machines. It is obvious that if a change of this importance can be successfully effected, it will have an important bearing on the ever-present problem of the native labour supply for the industry in general. The improved results obtained during the year are in part also attributable to the working of the water-right claims acquired from the Government on terms explained at the last annual meeting. As you were then informed, it was decided, in order to make the maximum profit out of the transaction, to work out this area, amounting to about $5\frac{1}{4}$ claims, as rapidly as possible. This policy is being duly carried out, and, as was anticipated, the ore contents of this area have proved to be of considerably higher value than that of the ore reserves of the remainder of the mine. As a result, the average recovery value of the ore crushed during the year has somewhat exceeded the value of the ore reserves as disclosed, both at 31st March, 1911, and 31st March, 1912, and, in consequence, the sum of £5,000 per month referred to above, which has been calculated to represent approximately the difference between the estimated normal profit of the mine and the profits actually made, has been placed to the credit of a special reserve fund, the accumulation of which will provide for the total payments to be made to the Government in respect of this area within a reasonable time after its ore contents are exhausted. For this purpose half the stamps are eventually to be discarded and five tube-mills added, these, as well as the existing five tube-mills, being placed low enough to receive the coarser particles in the pulp from the batteries by gravity and the cost of pumping the coarse screen pulp thus avoided. With coarse battery screening a stamp duty of about 15 tons is expected, and the component parts of the discarded stamps will be gradually utilised as spares for renewals. This coarse stamp milling involves removal of the stamp-mill amalgamated plates, which it is estimated will release upwards of £20,000 worth of gold from stock (of which £9,096 has been recovered during the year under review), or sufficient to defray the cost of the changes in the crushing plant. When the change is complete, the whole of the amalgamation process will be carried out by means of three stationary plates per tube-mill in a separate building, thereby reducing risk of loss by pilfering to a minimum. Some of the above changes have already been effected without difficulty or interference with current crushing operations, and the complete rearrangement is expected soon to be in operation. At the same time, to supply clean sand for mine filling purposes and to reduce cost of surface handling, diaphragm cone classification of the tailing pulp is being installed, and four additional slimes vats added to deal with the consequent considerable increase in slime tonnage, so that the conditions of cyanide treatment will likewise be improved, and the present recovery of 96 per cent. of the gold contents of the ore from all sources possibly improved on.

More Claims to be Acquired.

Your directors have under consideration at the present time the acquisition of certain claims situated on Booysens Estate, north of what is known as the Grahamstown dyke, and which adjoin the company's southern boundary. The acquisition of these claims, which is recommended by your superintending engineer, would prolong the life of your mine very considerably, and the present equipment and shafts, the incline of one of which has already entered this ground, present facilities for mining and treating the ore from this area to great advantage. The exact number of these claims cannot be accurately determined until the position of the Grahamstown dyke is definitely located, but it is estimated that there are some 50 claims comprising the block. Before, however, any definite agreement is entered into, shareholders will be given an opportunity of considering the proposal fully. During the coming year, and for some time to come, the company will have a considerable liability to face in the shape of compensation to sufferers from miners' phthisis and their dependents, under the Act which has just been passed. Everything reasonably possible is being done and considerable expense has been incurred in improving the ventilation and minimising the amount of dust caused by operations in the mine, and, as you will see from the manager's report, considerable success has already been achieved in this direction. In conclusion, your directors have much pleasure in placing on record their appreciation of the excellent services rendered by your manager, Mr. Wessels, his staff, and the employes generally, more especially in obtaining the increased efficiency and economy of labour of which I have spoken.

The report and balance sheet were unanimously adopted.

The retiring directors, Messrs. F. D. P. Chaplin, M.L.A., and Clement Davies, were re-elected, and the auditors were re-appointed.

The meeting then terminated.

JAGERSFONTEIN COMPANY.

Annual Meeting.

Presiding at the twenty-fourth annual meeting of the Jagersfontein Mining and Exploration Company, Sir David Harris prefaced his review of the year's operation and the company's position with a reference to Sir Julius Wernher. He said that he and Sir Julius Wernher sailed from England together in 1871. Sir Julius was a member of the board of the Jagersfontein Company from its inception. Sir Julius made a fortune, but what was better, had left a record as an upright, charitable, benevolent man. The uncertainty of mining had necessitated abandoning hauling through the open mine during the past year owing to heavy falls of reef. The board, however, was adhering to its policy, declared at the last meeting, of placing three million loads of blue ground on the floors, which he expected would be effected at the end of March, 1914, there being 1,853,545 loads on the floors on the 31st of March last. They were now hauling exclusively from the main shaft, which had increased the cost per load by tenpence. That would be compensated for by the additional quantity hauled and steady work. They expected lower working costs somewhat this year, though the underground system would always cost more than hauling in open mine. The enormous sums spent in preparing the underground system had been provided out of the profits, which he considered a wise policy, though this had the effect of reducing the return to the shareholders. The amount spent in hauling and washing this year was £615,374 against £373,324 last year. For this additional expenditure, they had hauled 864,725 loads and washed 362.548 loads more than last year.

During the year they had paid in dividends £425,000, equal to ten shillings per share. They had written off £51,885 for depreciation, set aside £12,735 for profit tax, and carried forward £222,082. The diamonds produced during the year realised £1,116,432, an increase of £122,653 over last year. The railway rates between Springfontein and Jagersfontein had been reduced by about half from April last. This year the company produced 3,446,635 carats of diamonds against 333,831 last year, the average prices realised being 64s. 9d., against 56s. 3d. This gratifying rise was the result of barely supplying the demand for the fine class diamonds yielded by the Jagersfontein Mine.

The market, during the year, was buoyant, and was still in that favourable condition. In fact the prices of good qualities had advanced considerably. As a result of the erection of a new pulsator plant a higher proportion of greased tabled diamonds was now included in the ordinary and hoppering finds. This year they produced 10,810 carats, including 5,582 carats of old sortings, worth 12s. 10d. per carat more than last year for an additional expenditure of £122,643. In conclusion, Sir David Harris referred to the efforts during the present session of the Union Parliament to discover means of putting additional taxation on the holders of South African mining shares, conveying the idea to European shareholders that the Government was hostile to foreign capital entering the Union, the effect of which would be injurious to South Africa, which required to borrow large sums to develop the natural resources apart from the money required for new discoveries. He also deprecated the attitude of the Mining Department in requiring a company to prepare unnecessary voluminous returns, the value of which, for practical purposes, he could not see. He would not promise that the dividend would be increased this year, as even with the reduced working costs, the policy of increasing the blue on the floors would absorb a portion of the cash profits. When the company had been put in a strong position from a mining point of view, and an easy financial condition, if the demand for diamonds continued as at present, it would not be difficult to give shareholders a better return. He paid a tribute to the staff in connection with the change of the system of working during the year, which had been effected without the slightest stoppage of work.

S.A. LAND & INVESTMENT.

Annual Meeting.

The annual general meeting of shareholders in the African Land and Investment Company, Limited, was held in the Board Room, Consolidated Gold Fields Buildings, last week. Mr. F. D. P. Chaplin presided, and there were also present: Messrs. J. E. Kent, D. W. Rossiter, W. S. Smits, F. L. Brown, H. H. Oldroyd, E. Bell, J. H. Wellbeloved, and W. E. Eastwood (secretary).

There were represented personally and by proxy 147,116 shares, out of the issued capital of 300,000 shares.

The Chairman's Speech.

The Chairman said: In presenting to you the accounts for the past year, I have to point out that, while the state of the property market throughout South Africa is on the whole encouraging, it would not have been possible during the past year to realise any of your more important properties, except at prices considerably below their book value.

The revenue from rentals shows a small increase as compared with last year, and now stands at a figure which may fairly be regarded as more or less permanent.

The managing director's report deals fully with your company's operations during the year.

The Government buildings on Von Brandis Square, to which reference was made last year, are now completed and in occupation, and other large and important buildings are in course of erection in the vicinity. This activity has brought about many enquiries regarding those of your properties which are in that neighbourhood, as well as a few tentative offers, but no business as as yet resulted.

Dunkeld and Illovo townships have been brought within reasonable distance of the town by the tramway extension described at last year's meeting, and a few Dunkeld plots have been sold.

Reports from Capetown, Delagoa Bay, and Durban agree in stating that while prices are considerably below those ruling in 1902-3, when your properties in these towns were purchased, there is an increasing demand for properties at to-day's prices, and that business is being done on that basis.

This also applies to Johannesburg, where property purchased just after the war when prices ruled high, can to-day only be realised at a distinct loss.

The accounts attached show that your investments in fixed properties now stand at £445,956 4s. 6d., as against £445,640 9s. 1d. last year. During the period under review the amount was increased by £255 19s. 1d., in respect of 35 leasehold stands in Claremont, re-acquired by the company.

Loans on bond amount to £12,612 10s. 1d., as against £12,951 15s. 7d. last year.

Shares and investments in sundry companies now stand at £41,735 2s. 0d., as against £50,459 14s. 9d. last year, the following changes having taken place therein:

Yuba Consolidated holding, then shown as under call, has been taken up.

Transvaal Gold Mining Estates, 1,000 shares have been sold.

Mississippi River Power Company Investment then shown as having only 10 per cent. paid up has been paid in full.

Knight's Deep share holding has been increased by the purchase of 775 shares, making your total holding 1,275 shares.

Dividends on investments amount to £1,267 18s. 3d., as against £3,685 15s. 10d. last year, the difference being chiefly accounted for by the sale of the Yuba shares from which regular dividends had been received.

Sundry debtors owed you £6,762 13s. 10d., at 31st of March, 1912, most of which has since been paid.

Cash on hand amounted to £6,601 6s. 6d., which included provision for debenture interest payable on 1st of April, and since paid out.

On the debit side of the balance sheet capital and debenture issue remain unchanged and due provision is made for the debenture interest.

An amount of £2,039 2s. 3d. was at the 31st of March due to sundry creditors for trade, municipal and other accounts and has since been paid.

The amount of £7,000 shown as reserve on account of depreciated values of investments and fixed assets, is in accordance with the policy foreshadowed at the last annual meeting, and is a necessary provision in view of the fact that the values of some of your assets have fallen appreciably since their acquisition and of the further fact that, up to the present time, with the exception of the sum of £500 mentioned at last meeting which is now included in the £7,000, no provision has been made for depreciation.

The revenue and expenditure account shows that the total income of the company, from all sources, amounted to £1,480 13s. 4d. last year.

Maintenance, including rates on revenue producing properties amounted to £1,180 13s. 4d. as against £5,435 2s 0d. last year, a decrease of £551 8s. 8d. Rates, licences and sundry disbursements on unproductive properties absorbed £807 15s. 1d., as against £775 4s. 6d. last year. Reconditioning and sewering properties cost £1,715 13s. 1d., the whole expenditure having been written off. In order to prevent the recurrence every three or four years of the large disbursement necessary to maintain the exterior of your properties in good order, it is proposed to create a reserve whereby the amount to be provided will be spread over a certain period.

The other items in the account are practically fixed charges and should only vary slightly from year to year.

The balance of revenue over expenditure for the year, amounting to £2,977 18s. 6d., has been carried to Appropriation Account, the eventual balance of £323 1s. 6d. being carried to the balance sheet.

It is a matter of great regret that it has again been found impossible to meet the dividend on preference shares, and the total amount unpaid in this respect now amounts to £33,250, and figures in the balance sheet as a contingent liability.

I now beg formally to move the adoption of the report and accounts.

The resolution was carried unanimously.

The retiring directors, Messrs, F. D. P. Chaplin and W. S. Smits, were re-elected, and the auditors, Messrs. T. Douglas and F. W. Diamond, were re-appointed. This was all the business.

Official Labour Statistics for May.

The following figures supplied by the Government Mines Department show the total number of persons in the service of companies and companies' contractors in the Transvaal and Union, but do not include a certain number of coloured convicts employed on the Witwatersrand area:—

GOLD MINES.

	White.	Coloured.
Witwatersrand	24,005	201,438
Heidelberg	242	2,764
Klerksdorp	92	957
Ottoshoop	6	82
Barberton	272	3,283
Pilgrim's Rest	260	4.557
Pietersburg	18	252
	24,904	213.333

The total for coloured labour on the Witwatersrand does not include 695 coloured convicts.

YEAR'S PROGRESS.

The following table of numbers actually in the employ of companies and companies' contractors shows the progress of labour for the whole Transvaal for the last thirteen months:—

	Gold Mines.		All Mines.	
	White.	Coloured.	White.	Coloured.
1911—				
May	26,111	208,913	28,010	237,376
June	25,960	206,197	27,850	233,598
July	25,780	201,485	27,668	229,071
August	25,632	198,332	27,521	225,105
September	25,431	196,421	27,332	224,084
October	25,329	196,019	27,214	223,171
November	25,157	195,073	27,033	221,113
December	25,114	194,336	26,978	218,811
1912.				
January	25,224	198,595	27.116	223,227
February	25,212	204,923	27,146	231,459
March	25,151	211,592	27,130	239,861
April	24,906	215,148	26,907	245,642
May	21,904	213.333	26.946	245,642

Grand total of the numbers in service of Transvaal mines, 272,588.

UNION TOTALS.

	White.	Coloured.
Transvaal	26,916	245,642
Cape	2,951	18,680
Orange Free State	1,226	12,732
Natal	513	10,679
	31,636	287,733

Sheba G.M. Co.

The Secretary writes:—I am instructed to inform you that we are in receipt of a cable from our London office that a third dividend at the rate of 5 per cent. has been declared on account of the current year ending 30th June. This dividend will be payable on the 2nd August to the shareholders registered in the books of the company on the 8th July.

S.W. Diamond Fields: The Returns for May.

The returns of finds made during the month of May at the various centres of diamond digging throughout the Western Transvaal are as follows:—

	Carats.	Value.		
Bloemhof	2,517¾	£11,360	11	0
Mooifontein	2,282¾	9,743	13	0
Panfontein	438	1,685	2	6
London	336¼	1,276	5	0
Weltevreden	274½	1,032	5	0
Modderkraal	143¼	911	0	6
Blesbokfontein	168¾	634	5	0
Goedgenoeg	77⅝	520	10	0
Avondster	94	354	5	0
Koksrust	72¼	330	15	0
Grootdoorns	62¼	262	15	0
Christiana	16	233	15	0
Kromellenboog	52¼	163	15	0
Rietput	34¼	157	0	0
Koppiesvlei	29	156	0	0
Zoutpan	28½	137	0	0
Other sources	36	111	10	0
	6,693⅝	£29,100	10	0

The month's total is nearly £3,000 higher in value than the April output, and for the sake of comparison we give the figures for the five months of 1912 to date:—

	Carats.	Value.		
January	6,265⅜	£32,026	3	0
February	7,501⅝	34,997	17	6
March	7,874½	37,352	16	9
April	5,904½	26,181	7	0
May	6,693⅝	29,100	10	0
	31,239⅝	£159,658	11	3

New S.A. Companies Registered in London.

OSTRICH FARMERS, LIMITED.

This company was registered in London on May 21, with a capital of £1,000, in £1 shares, to carry on the business of ostrich farmers, breeders, and rearers, etc., in Africa or elsewhere. Private company. The number of Directors is not to be less than two nor more than seven: A. Holt is one of the first. Qualification, 10 shares. Remuneration as fixed by the company. Registered office: Lennox House, Norfolk Street, W.C.

FARM LANDS OF RHODESIA, LIMITED.

Registered June 1, in London, by Coward and Hawksley, Sons, and Chance, 30 Mincing Lane, E.C. Capital, £250,000, in 5s. shares. Objects: To carry on the business of farmers, dairymen, graziers, cattle and horse breeders and dealers, promoters of immigration and of the establishment of towns, villages and settlements, miners, smelters, explorers, etc.; to acquire certain farms, stands, and town lots in Rhodesia, to deal with and turn to account lands, stock, wool, cattle, grain, produce, and other property in the Union of South Africa, Rhodesia, the Bechuanaland Protectorate, or elsewhere, and to adopt an agreement with the London and Rhodesian Mining and Land Company, Limited, the Enterprise Gold Mining and Estates Company, Limited, and the Imperial Gold Mines and Estate Company, Limited. Minimum cash subscription, 7 shares. The first Directors (to be not less than 3 nor more than 5) are Hon. C. J. White, 5 Moorgate Street, E.C.; M. Weil, 3 and 4 Lothbury, E.C., and B. F. Foran, 20 Lancaster Gate, W. Qualification, £100. Remuneration: £100 each per annum (Chairman, £150) and 10 per cent. of the net profits remaining after 10 per cent. dividend is paid, divided between them (maximum remuneration, £1,500 per annum in all). Registered office: 5 Moorgate Street, E.C.

Contracts Open.

The Secretary to the Tender Board, South African Railways Headquarter Offices, Johannesburg, invites tenders for the supply of 60 lb. and 80 lb. section rails and fastenings to drawings, Type E.100 and E.200 (July 2)

The Municipal Council of Johannesburg invites tenders for the supply of sanitary pails and lids (August 2nd), licence plates and badges (2nd August).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of 904,625 hardwood sleepers or (alternatively) creosoted Baltic sleepers (July 23).

The Chairman of the Union Tender Board, Box 371, Pretoria, invites tenders for the supply, delivery, and fixing in position where necessary, certain show cases, furniture and fittings, to the Public Museum at Bloemfontein (July 31).

The Corporation of Pietermaritzburg invites tenders for the supply of one steam turbine with tandem generators, switchboard, and condensing plant (July 29).

The Municipality of Frankfort, O.F.S., invites tenders for the supply and erection of the pipe services and machinery in connection with the Town Water Supply (July 4).

The Municipality of Ladismith, Cape Province, invites tenders for the supply of six inch steel pipes and other incidentals thereto for the proposed water scheme (July 15).

The Chairman of the Tender Board, Provincial Auditor's Office, Capetown, invites tenders for the erection of a bridge over the Klip River at Swellendam, Cape Province (July 3).

New Patents.

269. Matthew Moloney.—An improved fire alarm.
270. John Wallace Page.—Improvements in wire fence fabric.
271. Josceline Reginald Heber-Percy.—A new or improved device for locating the presence of water, minerals and the like.
272. Gustavus Adolphus Sheeley.—Improvements in converting steel ore and wrought iron into cast iron.
273. Ernst Teichmann and Hugo Braun.—The manufacture and production of preparations for giving immunity against trypanosomes and other pattiogenous micro-organisms.
274. Albert Edward Rogers and Charles Dickie.—Improvements in dust collectors for rock drills.
275. Frederick Victor William Swanton.—Improvements in power producing apparatus.
276. Augustus Meyrick Hewett Thorp.—Means for feeding ore, coal, pebbles and like material from storage bins.
277. John Hudson Hughes.—An improved safety catch for use on skip cages, lifts and the like.
278. David Mc. Auslin.—Improvements in boots.
279. Daniel Shaw Waugh.—Improvements in or relating to drilling apparatus.
280. Pascal Marino and Quintini.—Improvements in the electrolytic deposition of metals particularly upon iron or steel surfaces.
281. Nils Testrup.—Improvements in and relating to the treatment of sewage and the like.
282. Wilhelm Mauss.—Improvements in power driven swinging chute conveyors.

New Companies.

3985. Carr Regis and Newbery, Ltd., 5 and 6, B. and T. Buildings, 68, Commissioner Street, Johannesburg; capital, £6,000.
3986. South African Golf Ball Co., Ltd., 4, 7, and 8, Trust Buildings, Fox Street, Johannesburg; capital, £600.
3987. Globe Literary Agents, Ltd., 45, Kerk Street, Johannesburg; capital, £500
3990. Bull and Oehmen, Ltd., 23a, Rissik Street, Johannesburg; capital, £6,000.
3991. South Africa Kinemacolor Co., Ltd., 35, Steytler's Buildings, Loveday Street, Johannesburg; capital, £5,500.
3994. Robert Hamilton, Ltd., 247 and 249, Church Street, Pretoria; capital, £22,500.
3995. West Rand Unified, Ltd., 29-35, Jeppe Arcade, Commissioner Street, Johannesburg; capital, £187,500.
3996. Arcadia Tea Rooms, Ltd., Stand 462, Ockerse Street, Krugersdorp; capital, £500.
3998. Rex Zaaiplaats Central Tin, Ltd., Bettelheim Buildings, Simmonds Street, Johannesburg; capital, £22,000.
3999. Autocar Exchange, Ltd., 67, Marshall Street, Johannesburg: capital, £700.
4000. Lamb, Raphaely and Co., Ltd., 19a, Simmonds Street, Johannesburg: capital, £2,000.
4001. Benoni Exploration Syndicate, Ltd., 8, Orr's Buildings, corner Market Avenue and Fort Street, Benoni; capital, £1,500.

Extraordinary and Special Resolutions.

2511. Diamond Cycle Co., Ltd., Johannesburg; sale of assets.
3845. The Ovraal Paint and Composition Company, Ltd., Johannesburg; placing company in voluntary liquidation.
3705. Diespecker Gold Mining Co., Ltd., Pretoria; placing company in voluntary liquidation.
3891. African Film Syndicate, Ltd., Johannesburg; amending articles.
3362. Tube Mills Patents Consolidated, Ltd., Johannesburg; conversion into private company.
1915. Co-operative Exchange Yard, Ltd., Johannesburg; alteration of articles.
2856. Northern Lime Co., Ltd., Johannesburg; conversion into private company.
3079. Solomon's Temple Tin Mines, Ltd., Johannesburg; amendment of articles.
3631. Moorhouse, Ltd., Johannesburg; change of name.
3876. New Penwith, Ltd., Johannesburg; sale of assets.
3258. Botha Reefs, Ltd., Johannesburg; sale of assets
1192. Wolhuter Gold Mines, Ltd, Johannesburg; alteration of articles.
1189. Witwatersrand Deep, Ltd., Johannesburg; alteration of articles.
1118. Knight Central, Ltd., Johannesburg: alteration of articles.
1070. Treasury Gold Mines, Johannesburg: alteration of articles.
1320. Consolidated Main Reef Mines and Estate, Ltd., Johannesburg; alteration of articles.
1615. Main Reef West, Ltd., Johannesburg: alteration of articles.
1358. Witbank Colliery, Ltd., Johannesburg; alteration of articles.
1055. Marievale Nigel Gold Mines and Estate, Ltd., Johannesburg; alteration of articles.
1847. Cloverfield Mines, Ltd., Johannesburg: alteration of articles.
3203. Du Preez Consolidated, Ltd., Johannesburg; disposal of certain claims.
3754. West Rand Unified, Ltd., Johannesburg; acquiring certain assets of other companies.
960. Rietkuil Gold Mines, Ltd., Johannesburg: alteration of articles.
1056. Vogelstruis Consolidated Deep, Ltd., Johannesburg; alteration of articles.
3773. The East Coast Timber Co., Ltd., Johannesburg; alteration of articles.

Additions and Alterations.

3616. John Russell and Co., Ltd., Johannesburg.

Prospectuses.

3929. Economic Investors Trust Co., Ltd., Johannesburg.

Change of Name.

3631. Moorhouse, Ltd., to Harcourt and Co., Ltd., Johannesburg.

Voluntary Liquidations.

3845. The Ovrall Paint and Composition Co., Ltd., Johannesburg.
3705. Diespecker Gold Mining Co., Ltd., Pretoria.

INVESTORS' DIARY.

The following company meetings have been announced:—

July 19.—Transvaal Consolidated Lands.
Aug. 30.—Treasury Gold Mines; Wit. Deep; Crown Mines.
Sept. 23.—Crown Mines.

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Notes and News.

Knoppieslaagte. The attention which was drawn some time ago to the reefs in the quartzites above the Black Reef horizon along the Kromdraai-Tweefontein line, north of Johannesburg, has not diminished apparently. A good deal of exploratory work has been carried out for several months past upon the farm Knoppieslaagte, and the results are reported to be quite satisfactory. It is not unlikely that a battery will be erected in the neighbourhood at an early date. Since excellent values have been obtained at numerous points along the line, and in view of the fact, also, that the same formation is productive in the Lydenburg district, it is somewhat surprising that no one has had the courage to give the Kromdraai-Tweefontein reefs a fair trial. What has hitherto been done in the way of recovery operations has been on a scale and under conditions which render want of success almost inevitable. It is much to be hoped that the new venture will be carried out on adequate lines. To judge from the names of those interested, it is not unlikely that it will be.

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West Rand Unified. The 4th of July having been considered an auspicious day upon which to have a more or less official opening of the mill at the West Rand Unified, the steam was duly turned on and the stamps dropped. The plant is said to be in excellent tune, and only a few preliminaries with regard to water service and other matters are still required in order to permit of the continuous running of the whole mill of twenty stamps.

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Manufacture of Oxygen. Examples of enterprise at the New Transvaal Chemical Co.'s works at Delmore multiply daily. The latest departure is in the direction of providing oxygen at a price and in sufficient quantity to encourage the use in South Africa of the oxygen-acetylene and various related welding processes involving oxygen. It is recognised that the heavy cost of importing oxygen cylinders has considerably handicapped these processes in this country. With this object the New Transvaal Chemical Co. has made arrangements with the British Oxygen Co., Ltd., the owners of the Linde patents, for erecting a large oxygen-making plant of the most modern type at Delmore. The plant will be capable of supplying, at a moderate figure, the whole needs of the Rand, and of South Africa even, in the event of the use of the new welding process becoming as general as its many admitted merits warrant. The New Transvaal Chemical Co. will also supply the necessary plant and apparatus for the use of the oxygen process in workshops, etc.; and it is expected that this important addition to the Delmore works will be ready in a few months' time. We need scarcely add that this fresh illustration of the progressive spirit that guides the Delmore enterprise is bound to command success.

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Iron and Steel-Making Progress. We understand that the new manager of the S.A. Iron and Steel Company is on his way from England with a staff to start operations. There is also on the water machinery and plant to the value of £50,000. A commencement, therefore, of the works at Vereeniging cannot long be delayed.

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Bubola. Trials are being made at the Nourse Mines of the Bubola process, and though the hopes of the promoters have not yet been realised, the process has much to be said for it. It is a pity that the shares of a syndicate that is exploiting a new and untried scientific process should have been allowed on the market, as there is, in consequence, a natural tendency in that quarter to magnify or belittle unduly the value of the patent.

Goerz Finances and Policy.

In a significant passage in his speech at the annual meeting of Messrs. A. Goerz & Co., Ltd., reported in this issue, Mr. M. G. Elkan announced last week that all prospecting options on ground in this country had, owing to non-success, been abandoned. It is to be hoped that Messrs. Goerz & Co. will again devote some interest to our "outside districts." A full report of Mr. Elkan's speech will be found elsewhere; and attention may be drawn to his important remarks on the labour recruiting question.

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Important Rhodesian Flotation.

During the last week the rich Pickstone Mine, situated about 17 miles from Hartley, has been placed on the market under favourable auspices. The capital has been fixed at the moderate figure of £50,000, and the vendors, Messrs. Wm. Stokes, B. M. Stokes, H. Stokes, and A. E. Ward, are taking the whole of the purchase price of £24,000 in shares, there being no cash consideration. This in itself is sufficient to indicate the vendors' faith in the future of the property, and in addition to this, they have undertaken to purchase at par all the unsubscribed shares of the present issue and have also agreed to withhold from the market at least 75 per cent. of their vendor share holding for six months from the date of registration of the company. The reports on the property are excellent. Attention may be drawn to the small capital compared with the estimated profits in the ore now ready for milling, and to the value of the new reef opened up since the report was made, from which over £11,000 worth of gold has been recovered from 2,074 tons of ore. Fuller particulars will be found in our advertising columns.

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The New Miners' Pay.

The Miners' Association is agitating against the proposed new contract, of which notice was given last week by the Chamber of Mines. Notices have been sent to all the members of the Association in the following terms: As the result of an emergency meeting of the Executive of the Transvaal Miners' Association, you are summoned to attend a meeting of the members of this Union to be held at the Trades Hall on Sunday next, July 7, at 10.30 a.m.: (1) To consider the advisability of making an application for the appointment of a Board of Conciliation and Investigation under the Industrial Disputes Prevention Act, 1909, with regard to disputes arising out of the new proposed agreements sought to be enforced on your mine and on the mines generally, and arising out of the general conditions of employment of miners, and (2) To appoint representatives to make such application.

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Crown Mines Debenture Issue.

The details of the proposed issue of £1,000,000 worth of debentures by the Crown Mines, Ltd., are thus specified in the notice to shareholders. (1) "That in pursuance of Article 49 of the Company's Articles of Association, the directors be, and they are hereby, authorised and empowered to borrow from time to time a sum or sums not exceeding a total of £1,000,000 (one million pounds sterling), and in terms of the powers vested in them by Articles 50 and 51 of the Articles of Association to secure the sum or sums so borrowed by the issue of First Mortgage Debentures upon the whole or any portion of the property of the Company and to settle and agree the terms upon which such sum or sums shall be borrowed." (2) "That the scheme for the issue of £1,000,000 (one million pounds) 5% (five per cent.) First Mortgage Debentures to Bearer, at the price of £97½% (ninety-seven and a half per cent.) as set forth in the Circular to Shareholders dated 28th June, 1912, be, and the same is hereby approved and the Directors authorised and empowered to proceed therewith, and to execute and cause to be registered the necessary First Morgage Bond or Bonds upon the said properties with the General Mortgage Clause, to secure repayments of the principal money, interest, premiums on redemption, and advances for reparation and payment of taxes and other outgoings to the amount of £1,070,000; further that the Memorandum of Agreement, dated the 30th day of May, 1912, between the Central Mining and Investment Corporation, Limited, and the Rand Mines, Limited, of the one part, and the Company of the other part, for the underwriting of the said issue, be, and the same is hereby ratified." Preference is, of course, to be given to the shareholders and the issue is to be guaranteed by the Central Mining and Investment Corporation, Ltd., and by the Rand Mines, Ltd., for a commission of 3 per cent. The debentures are to be repaid at 103 per cent. in eleven annual instalments of £85,000 each, and a final instalment of £50,000, the first instalment to be repaid on the 1st January, 1915. The meeting to consider the proposals will be held on Friday, the 30th August.

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Village Main Ore Reserves.

At the meeting of the company in London on the 27th ult., the Chairman, Mr. M. A. Braunstein, said, in regard to the ore reserves: "It has been our practice, and we think it our duty, to give the shareholders all the information we can as to the future life of the mine. We are in a position to make a fairly definite statement as to the next two years, but after that we can only give you anticipations. These anticipations, however, are based upon reasoned probabilities, and can, I think, be regarded seriously. Your manager has stated that the ore reserves now developed amount to 1,418,000 payable tons, and the assay values show that these are approximately of the same value as the ore that has been worked during the last two years. These ore reserves, on the basis of the quantity mined last year, represent another two and a half years' work from the date of calculation—December 31st, 1911—and I see no reason why we should not obtain during the working out of these reserves profits at about the same rate as have recently been made. Beyond these reserves we have certain portions of the mine which are as yet undeveloped, and it is, of course, impossible for us to say what the actual value of these will be until the development therein is completed. In order to give you some indication, however, I have ascertained that the areas at present remaining within the company's boundaries which are not yet developed are approximately equal to the areas covered by your present payable reserve. Furthermore, they are, to a large degree, adjacent to and extensions of the blocks of ore now constituting the payable reserves, so that we have reasonable ground to expect a further considerable addition to our reserves from these sources, the actual amount of which it will only be possible to give you when the necessary development is done. When this work is completed the estimates will be made so far as any definite statement of tonnage in blocked-out areas is concerned. If our anticipations are realised, our life may thereafter be extended for two and a half years after the two and a half years which we estimate will be required to work the ore now developed; but the history of the Rand has shown us that the life of a mine is by no means ended when all the ore developed is exhausted."

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Montrose Diamonds Again.

It will be remembered that at the Montrose meeting in September it was explained that, in the opinion of the manager, a sum of £15,000 was necessary to test, up to a definite conclusion, what he considered a very promising proposition, notwithstanding the adverse opinion of Mr. Draper. Endeavours were made by the Board to place an issue of 6 per cent. debentures, but without success, and up to the present matters have remained in abeyance. It may be taken, perhaps, as a sign that the outlook for the African market generally is improving that the company has now been able to arrange for the provision of further capital. The method proposed is to create an issue of 100,000 preference shares of £1, to carry a cumulative dividend of 6 per cent., and entitled to 50 per cent. of the profits of the company after the preferential dividend is paid. The issue of £25,000 of these preference shares has been guaranteed, but they will be offered in the first place to the shareholders. It is intended also to create twelve deferred shares of £1 each, which will be entitled to 3 per cent. on the value of all diamonds obtained from the company's property, and these shares will form part of the consideration for the guarantee of the £25,000 to be issued. There are

82,050 ordinary shares in issue, and if only 25,000 preference are issued, one preference share would, over and above its 6 per cent. interest, draw the same share of profits as 3·28 ordinary, on which basis, if ordinary are worth 13-16, preference would be worth £2 13s. 3d. or, say, 2 21-32. On these terms the offer of the preference to the shareholders at par is no doubt regarded as a bonus, and the directors must be congratulated on the ingenuity with which they have framed their scheme, and on their ability to encourage the hope that "springs eternal."

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Barrett Gold.

The report of the Barrett Gold Mining Company, Limited, for the year ended February 29 last states that, after writing off £1,849 expended upon prospecting work and depreciation on investments £236, a loss of £3,398 has been sustained upon the year's operations, which, added to the balance brought forward from the previous year, increases the debit balance of the profit and loss account to £4,579. During the year no fresh discoveries of payable ground resulted from the work of exploration carried on along the dyke courses; consequently ore supplies were again drawn from the existing surface mines in sufficient quantities to maintain the plant in full operation, but the quality was exceedingly poor.

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Diamond Proprietary.

The Diamond Proprietary Mines, Ltd., has issued a circular announcing that the farm Gong-Gong, owned by the company, was proclaimed an alluvial diamond digging on May 24, and that 1,000 claims were at once pegged out. An hotel is being erected on the property by a local firm at a cost of £2,000. There is a landing stage, and, from this, as from other sources, the company will derive a revenue. The average area of the farm actually worked for the subjoined production is reported to be equivalent to about 220 claims per annum. From 1908 to 1911, there were recovered 15,966¾ carats of diamonds, the official valuation being £75,498.

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Chartered 1912 Options.

Considerable doubt having arisen among Scottish shareholders as to the precise effect of the notice printed in red at the top of the application forms in respect of the 1912 options of the British South Africa Company that "all remittances must be made free of cost to the company," the registrar has been communicated with, and replies that all remittances should either be in the form of a draft on London, or include an amount sufficient to cover the collecting commission. The company, it is added, can only issue shares under the option certificates against payment of the full amount of £1 per share.

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The Connemara Mining Co., Ltd.

It is reported that under the auspices of Willoughby's Consolidated, Ltd., there will shortly be registered the Connemara Mining Co., Ltd. The property, which comprises 108 claims, or some 237 acres in extent, is said to be favourably situated for cheap working in Gwelo district, near the Hunters Road Siding, and within three miles of the railway. It is owned jointly by Willoughby's Consolidated, Chicago-Gaika, Surprise Gold and South African Option companies. Considerable development has been carried out during the past 12 months, with very encouraging results, some 90,000 tons, of a total value of about £160,000, having been already developed above the first level, which is located at 90 feet from the surface. The second level has recently been reached and is now being opened up by driving. There are said to be two distinct lodes of great size, from 16 feet and upwards in width respectively, the formation being banded ironstone. The total length of pay-shoots so far exposed by work at the first level amounts to close on 1,000 feet, the pay values still continuing on the extension The work so far accomplished, it is stated, gives every indication of the existence of a mine of large dimensions and considerable value. The nominal capital of the company will be £175,000 in 700,000 shares of 5s each. The vendors receive £120,000 in 480,000 shares. The necessary working capital for present requirements being subscribed by the vendor companies, there will be no public subscription.

TOPICS OF THE WEEK.

THE BENONI MUDDLE.

"Crying over spilt milk" appears to be a practice necessary to some people before they can be persuaded to accept the mistakes and misfortunes inevitable in mining. It was indulged in at considerable length at the Benoni meeting on Thursday, when Colonel Dalrymple, as Acting Chairman of the company, detailed at great length the history of the company in the last year, and bravely faced the music of a highly critical assembly. The vicissitudes of the ill-fated Benoni plant have occupied so much space in our columns of late that they do not require further recital from us; and the verbatim report of the proceedings at the meeting, which we print elsewhere in this issue, will be found to supplement the narrative of failure, as recounted by us from week to week. The importance of Thursday's meeting lay not in any new facts disclosed, but in the opportunity it gave for the all too infrequent, and not unhealthy, form of relief, or open confession, known as "having it out." Plain speaking there undoubtedly was at the meeting, and much hard hitting, but we are far from agreeing with the application to it of the epithets "regrettable" and "unfortunate" that fell so glibly from the lips of the speakers towards the close of the proceedings. To the original mistakes, no doubt, these adjectives can truthfully be applied; but, those mistakes having been admitted, nothing, to our mind, but good can result from a full public discussion by those chiefly concerned in the waste of shareholders' money. The mistakes themselves, of course, were many, and, unfortunately, not confined to the sphere of metallurgy. Mr. E. J. Way, of course, made a serious blunder in connection with the installation of the Way-Arbuckle process. How far the failure of that process is due to the unsympathetic attitude of those in direct charge of it; to too daring innovations in connection with it, or to absence of time to give it a fair trial, are debatable points into which it is now fruitless to enter. Unfortunately, Mr. Way's initial error appears to have been but the first ripple on the calm surface of things, and drew in its train larger and ever-widening disturbances. Had the Board of six acted more harmoniously, or had funds been less attenuated, it is possible the whole matter would have ended in scrapping the deficient plant, and promptly reverting to a safer, if less progressive, installation. Obviously the task of disentangling causes and consequences at this stage is a barren and bootless one. Recriminations began. Between the three biggest shareholders, each represented on the Board by two directors—the Anglo-French, the Jumpers Company and Messrs. Farrar Bros.—a rupture occurred. The sin of their consulting engineer was visited upon the Anglo-French, and the representatives of the other interests took up a hostile attitude towards the Anglo-French, talked of legal proceedings, and generally made things as unpleasant as possible for the latter firm and their engineer. Whereupon the Anglo-French people in London, in turn, took umbrage, and declared they were the wronged parties, having been accused of bad faith. Messrs. Farrar Bros., it must be said, appear to have maintained a peaceful attitude, and Sir George Farrar translated that attitude into soft words on Thursday, when he made a laudable effort to throw oil on the troubled waters. Indeed, it is earnestly to be hoped that Sir George's wise words will prevail, and that the necessary blood-letting of Thursday will send all parties back to their Board room this morning in a calm and chastened mood, with everything forgotten but the need for a united effort to turn the Benoni to the best account for the shareholders.

As we have already said, so far was the meeting from being unfortunate or regrettable, that we regard it as a distinctly good augury for the Rand. It provided a striking answer to critics of the place, who never tire of denouncing our mining companies for their "hole and corner methods." The affairs of few companies in the world of finance have faced a fiercer light of shareholders' criticism than that experienced by the Benoni on Thursday. It is a good and healthy sign when directors of a mining company can fall out and lose their tempers. The shareholders are then bound to hear the whole truth. One result has been that several questions hitherto regarded as of purely domestic interest and importance are now dragged out into the full light of day. Such questions are: (1) Is a controlling house responsible for the mistakes of its consulting engineer in advising the directors of a company of its group? (2) Does the fact that a group provides a company with a consulting engineer, a secretary, and two directors place it in control of that company, even if it hold no shares in the latter? and (3) What are the much talked-of "moral" obligations of a controlling house towards a company of its group? These and many similar questions arise directly from the discussion. Other not less interesting issues arise from the relations between Mr. Way and the staff at the Benoni. Was there "dual" technical control because the mine staff were appointed over Mr. Way's head? And how far can cliques of directors on a Board directly control a mine? All these fascinating topics we purpose to hold for future discussion. One possible conclusion to be drawn from the Benoni muddle is that a company can suffer from too little group control as well as from too much of it. Had the Anglo-French people been allowed to exercise a closer control of Benoni affairs, no doubt the chaos of to-day would not have resulted. Every friend of the shareholders and of the whole Rand will sincerely trust that Sir George Farrar's appeal for peace will be successful. As Colonel Dalrymple—whose handling of a difficult situation is to be commended—explained, only £75,000 is needed to give the property a fresh start with the necessary new plant, and we shall be greatly surprised if the Anglo-French, the Jumpers Company, and Messrs. Farrar Bros. do not now combine to render the necessary financial assistance. Indeed, the feature of the meeting was Sir George Farrar's frank offer to do his share in that direction, an offer which Colonel Dalrymple seemed prepared to accept. Of course, in this matter, as well as in regard to the related question of the Benoni-Apex Amalgamation, the last word remains with the board of the Anglo-French Exploration Co. in London. A special envoy of that board is now in this country—Mr. Henderson Clark, the London Managing Director—and we have sufficient confidence in him to be assured that he will counsel his fellow-directors to do the right thing. The worst, at any rate, is now known about both the Benoni and the Apex; and the worst is not so very bad, after all.

NEW CENTRAL NATIVE LABOUR RECRUITING ORGANISATION.

We are privileged this week to announce the consummation of the project to amalgamate the native labour recruiting organizations of the big houses of the Rand. Our readers will hardly need to be reminded of the importance of this event to the industry. It is true that the two mines under the control of Sir Joseph Robinson will stand out, likewise the Premier Diamond Mine. But with these exceptions, the gold and coal mines of the Transvaal have agreed to merge their existing native labour recruiting agencies, operating outside Portuguese East Africa, into one composite whole. The details of the scheme are necessarily of the most complex description, and they need not be gone into here. It is sufficient to-day to state that, after months of negotiation and ceaseless effort on the part of the Special Committee of the Groups, complete unanimity on all essentials has now been reached. The new central organization is to be constituted forthwith, and will, it is hoped, come into active existence on October 1. Control will be exercised by a General Manager, under a Board of Management, representative of all the groups, and with the supervision of an Advisory Board, composed of leading mining men and financiers, conversant with the conditions under which the native works and lives. It is an open secret that the first General Manager, who holds his appointment for a term of two years, is Mr. H. M. Taberer, who has for some years guided the native recruiting activities of the Corner House mines. The fact that a "Corner House man" has been appointed to manage the infant destinies of the organization, however, must not be taken to imply that the bigger houses have a preponderating "say" in the conduct of its affairs. As a fact, the organization is understood to be a model of fairness and equality, each group being adequately represented on the Board of Management and on the Advisory Board. The former, moreover, will live up to its name, and exercise a keen and direct influence on the management, and—what is equally important—*personnel* of the managerial staff. The fact that the Robinson group and Premier Mine are standing out means, at first, of course, cheaper labour for those properties; but the promoters of the central organization are cheerfully prepared to make the recusants a present of some small economies in view of the importance of welding the majority of the mines into the proposed combination. The allocation of labour under the new scheme will naturally be on a complement basis, and plans have been prepared acceptable to all parties, whereby the maximum of equality between mine and mine and between group and group will be maintained. Possibly the scheme may undergo minor modifications before the date of its actual coming into operation, and it may be advisable, therefore, to postpone discussion of other details to a later date. Of importance, however, is the fact that the existing *personnel* of the native labour recruiting departments of the houses will be provided with posts in the new organization, and that the existing contracts between certain mines and independent recruiting firms or "farmers of native labour" will be duly worked off. Apparently the constitution of the organization has been framed on lines sufficiently elastic to admit of these contracts running off at a saving to the mines of a considerable sum in compensation.

What the step means to the industry may be translated into globular figures. More than one chairman has recently placed the saving at many thousands a year; and, on examination it can be shown that it means in reality much more than that. For this year it is estimated that the saving may be considerable. Next year, however, the amount is likely to be nearly half as much again, for with each succeeding year the competition for native labour and the keenness with which the Kafir is pursued are bound to cost the mines a progressive and cumulative burden of expense. The fight that has been won, therefore, is less for economy than for very existence. It would be sheer industrial suicide for the mines to continue as they have recently been doing. Consideration of the vital necessity for the step now decided upon draws attention to the appalling consequences that may ensue in the unlikely event of its failure. Bad as is the position to-day, and black as was the outlook in the absence of combination, the state of chaos that would result from the cessation of the scheme about to be initiated would be infinitely worse. Deprived of their direct representation in the recruiting areas, and the fruit of many years' organizing work, the groups—especially the smaller—would at first find themselves at a standstill for labour, should the new project at any time collapse. Nothing, therefore, is likely to be left undone to ensure the permanent success of the scheme, and the groups will no doubt take jealous care to fulfil the letter and the spirit of their compact. That there should be a little suspicion and some misgivings just at first is no doubt but natural; and recognising this danger the groups are not likely to depart from a scrupulous exactitude in the fulfilment of their mutual obligations. A rupture at this early stage would be nothing short of an industrial calamity, and would retard the progress of the Rand for many a long day. In the interest of the whole place it is earnestly to be hoped, therefore, that the *personnel* of the new body will be carefully chosen, that the groups will recognise their enormous collective and individual responsibility in the matter of fair dealing, and that the new organization, which represents the triumph of commonsense and enlightened self-interest over the primitive economics of the Stone Age, will be successful in coping with the problem paramount of the industry.

NEW DIAMOND DISCOVERIES.

Derdepoort, Puntlyf, and Granaatplaats—Operations in Kleinsonderhout.

Among the most recent announcements of new discoveries of kimberlite is that from Puntlyf No. 147, about twenty-six miles south-east of Pretoria, and five miles south of Elands River station on the Pretoria-Delagoa Bay railway. Immediately to the south of the farm is Boschkop No. 295, where a contact deposit of argentiferous copper ore was opened up several years ago, and favourably reported upon by Dr. Molengraaff and others, but which was not developed to the extent that was warranted by the available evidence. Reports regarding the discovery of diamonds in this southern area have been current at various times, but the impression appears to have prevailed, for some reason or another, that the ground was outside the limits of the true diamondiferous region. There are, as a matter of fact, no assignable bounds to the area over which diamonds may be found in the Pretoria district or elsewhere, as far as actual knowledge goes, so that the possibility of finding payable kimberlite occurrences some distance south of the known pipes cannot be dismissed from our calculations upon any geological grounds. The discovery of diamonds in the neighbourhood in question and the existence of " yellow ground " are matters of interest, and justify the exploratory work which is proposed by those concerned. Puntlyf is situated mainly upon the wide band of shales which underlie the Magaliesberg quartzite; a section of the latter formation, with diabase overlying it, occupies the northern portion of the farm. A diamond is said to have been discovered some time ago upon the farm, and the information as to the locality of the find, although supposed to be incorrect, led to the opening up of yellow ground of promising appearance. No work of importance has so far been done, we understand, but a syndicate is in process of formation under the title of the Chancellor Diamond Syndicate, Ltd., of which the nominal capital will be £11,000 in £1 shares. Of this amount the vendors will receive 6,000 shares, and the balance of 5,000 will be allotted to the providing of working capital. The price asked for the freehold is £27,000, the area being 1,272 morgen, and the vendors have secured an option which has still some seven months to run. On the adjoining farm to the south-west, Kleinzonderhout No. 429, indications are said to be encouraging, and we understand that a syndicate has already commenced prospecting operations. The formation there is somewhat similar to that at Puntlyf, the same section of Magaliesberg quartzites and underlying shales striking directly across the property.

It was on the farm Kleinzondershout that kimberlite was first of all discovered in the southern area. We believe that the discovery was due to Mr. H. S. Harger, who did a considerable amount of exploratory work there, and located altogether some 700 claims. The work was done on behalf of a private syndicate, and although diamonds were discovered work was discontinued on account of the conclusion that the deposit was unpayable. We are unaware whether the more recent discoveries and operations are connected in any way with the earlier ones referred to. Another farm, south of the railway line, upon which kimberlite has been reported to have been found, is Mooiplaats, to the south-east of Pretoria, just beyond the Willows and Zwartkoppies. The occurrence, however, is said to be merely a fissure.

Derdepoort.

From Derdepoort there is little information, except that yellow and blue ground are reported from near the poort. The claim area upon Derdepoort, an estimated by those at present interested in the concern is, we understand, about 2,000 claims. This is a pretty considerable area, and it would be interesting to know how this figure is arrived at. The previous work in the vicinity of the " poort " to which reference was made in our last issue as having been done several years back, was, we learn, carried out by Col. Parrott. A diamond or diamonds were found near the spruit, as they have been more recently in the vicinity of the late kimberlite discovery. The Derdepoort occurrence is not altogether a newly-found-ont one; it was discussed a great deal a few months ago, and among others who had the matter in hand were the promoters of Vilma Diamond Syndicate, a venture which did not come to completion. Some time before that a report upon the property was made by Mr. Harger, who recommended that exploratory work should be undertaken. A sum of money sufficient for the purposes intended was quickly got together, but as a satisfactory arrangement was not arrived at with the owner the scheme fell through. About 25 claims were considered as actually proved, and from 50 to 75 more, at least, assumed as probable. The later estimate of something like 2,000 claims is so very much more in excess of these figures that, as we have said, it would be interesting to know the basis of the calculation. We pointed out in our last week's reference to the property that a body of volcanic breccia existed in the neighbourhood, and we learn that the kimberlite deposit lies in actual contact with this breccia. What appears desirable to be made quite clear is that the breccia has not been included in the estimate. Kimberlite may be termed a volcanic breccia, but a volcanic breccia, on the other hand, is not necessarily kimberlite, even when in close association with it. It is not difficult to distinguish the two, if not by means of hand specimens, then by microscopical examination, and there is no need, therefore, for uncertainty with regard to the subject. In a report made for the Vilma Diamond company, Mr. F. M. Krause said, *inter alia*:—" At a distance of about three-quarters of a mile to the north of the southern boundary of Derdepoort, and midway between Hartebeestspruit and Koedoes spruit, the stratified rocks are traversed by an intrusive body of peridotite, the trend and shape of which—whether dyke or pipe—are as yet imperfectly known. Its position superficially has been to some extent defined by a number of shallow pits that have been sunk upon it, but it must be understood that the boundaries as shown on the plan are merely provisional. The area superficially occupied by peridotite is bound on the south by a diabase dyke; on the east by a fault plane; on the north by a boss of felsite; while on the west it is obscured by local drift. This gives apparently a meridonal extent of 1,200 yards and a lateral extent of 350 yards. One diamond (at present in my custody), weighing about half a carat and several smaller stones were, I believe, found in the yellow ground taken from No. 4 pit. Among foreign enclosures in the yellow ground are fragments, from 2 to 9 inches gauge, more or less rounded, of hard peridotite, diabase, quartzite, schist and granite. At a depth of from 30 to 35 feet below the surface the yellow ground changes to a dark grey, moderately hard rock (" blue ground "), which has the character of a completely serpentinized olivine rock, rendered porphyritic by numerous, mostly large, phenocrysts of biotite. The felsite rock which seems to cut off the kimberlite at the Magalies Range is everywhere in too weathered a condition to allow of its mineral composition being readily determined. In the bed of the Koedoes spruit the rock is completely reduced to a white calcareous wacke, in which nevertheless some largish kaolinized felspar crystals have been preserved. A few yards further east, at the end of the outcrop, the rock passes into a coarse fault-breccia, in which the fragments of quartz and quartzite are 6 to 9 inches gauge. In No. 9 shaft, which lies close under the visible outcrop of the felsite, the yellow ground is exposed, from which circumstance it might be inferred that the felsite is a later eruptive, and that the kimberlite extends beyond it. There is at this place a stretch of deep sandy overburden, and to set the matter at rest I recommend the sinking of one or more trial pits on the left side of the spruit at about a hundred yards north of No. 9 shaft. An ample water supply, such as is needed for diamond washing on an extensive scale, can be drawn either from the Hartebeest spruit or Koedoes spruit, both being permanent streams. The nearest railway station, that at Silverton lies at a distance of about one and three-quarter miles from the mine."

GRANAATPLAATS.

Active work will probably be in full swing upon this property at about the end of the week. Preliminary details are now being arranged. An interesting feature of the kimberlite occurrence here is the existence within it of much broken and slickensided shales and the presence of granite and pegmatite boulders. The prospects of the neighbourhood are considered altogether good.

KOFFYFONTEIN EAST.

One hears this mine discussed among other new ventures nowadays, also, and readers may remember that we mentioned it as a revival of the undertaking worked many years ago by the Julius Pain Syndicate on the farm Twyfelhoek No. 104, near Koffyfontein. Mr. J. Gouldie estimated the mine to cover an area of anything between 400 and 600 claims, and spoke of a diamond of 14 carats, sold for £600, as having been recorded by a former owner. About 75,000 loads were treated about 18 years ago, and Mr. Gouldie calculated that a daily output of 3,000 loads could be reached for a small cash expenditure. We have no data to guide us in valuing the possibilities of the mine to-day.

THE YEAR WITH THE VILLAGE MAIN REEF.

Points from the Reports of the Consulting Engineer and Manager—Labour Shortage Keeps Profits Below Normal.

IN his annual report on the Village Main Reef, the Consulting Engineer, Mr. H. Stuart Martin, writes:—The main points for comparison with previous years may be summarised as under:—Tons milled: 1909, 513,800; 1910, 493,300; 1911, 476,250. Working profit declared (including profit from accumulations): 1909, £392,821; 1910, £462,635; 1911, £467,289. Development footage: 1909, 9,064; 1910, 7,735; 1911, 5,233. Payable ore reserves: 1909, 1,999,784 tons at 8·9 dwts.; 1910, 1,775,175 tons at 9·2 dwts.; 1911, 1,418,754 tons at 8·85 dwts. The ore reserves at 31st December, 1911, are estimated by your Manager to be as follows:—Main Reef Leader, 653,208 tons at 10·42 dwts.; South Reef, 584,868 tons at 7·55 dwts.: Main Reef, 86,207 tons at 4·41 dwts.; Old Workings in upper levels, 94,471 tons at 10 dwts.; total payable reserves, 1,418,754 tons at 8·85 dwts. The estimated stoping widths were 48 inches for the Main Reef Leader and 54 inches for the South Reef. In addition to the above ore reserves, there is an accumulation of unpayable ore in the mine estimated at 772,692 tons, of an average value of 1·8 dwts. per ton. The decrease in tonnage milled was due to the prevalent shortage of native labour. Based on actual recovery, the yield of the ore milled for the year showed an increase of 1s. 9d. per ton, but on the other hand there was an increase in the working costs of 1s. 4·8d. per ton, and in order to bring up the profit to the amount declared, 1,772 ozs. were taken from the reserve fund, which, at the 1st January, 1912, stood at 4,768 ozs. As long as the native labour position continues in its present unsatisfactory condition, there will be difficulty in providing the full tonnage for the mill, and until an improvement in this direction sets in, it must be expected that the monthly profits will not be up to normal. The bottom level west, which is connected with the Wemmer Section, has been straightened preparatory to being equipped with rope haulage. When this has come into commission, it will effect a saving of labour and in time permit of the closing down of the Wemmer shaft.

MANAGER'S REPORT.

Mr. R. Raine, the manager writes, *inter alia*:—The underground operations comprised the following:—Stoping, etc.—Stoping was carried on in the Main Reef, Main Reef Leader, and in the South Reef, resulting in a total of 552,891 tons, to which can be added the ore obtained from developing faces, making a total of 568,238 tons mined, of which 87,982 tons (15.5 per cent.) were from the Main Reef, 198,925 tons (35.0 per cent.) were from the Main Reef Leader, 281,331 tons (49.5 per cent.) were from the South Reef. The stoping widths in the Main Reef Leader averaged 49 inches and in the South Reef 58 inches. Development work.—The development operations resulted in the following footages:—Drives, 2,838 ft.; winzes and raises, 1,524 ft.; crosscuts, 842 ft.; sundry stations, ore chutes, etc., 29 ft.: total, 5,233 ft. Of the above footage 4,037 feet, or about 77 per cent., was in reef formation, the reef disclosures in which were as follows:—Main Reef Leader, distance exposed, 1,169 feet, width, 12 inches, assay value, 32.7 dwts.; South Reef, distance exposed, 2,848 feet, width, 14 inches, assay value, 25.5 dwts. The estimated tonnage of payable ore exposed by drives and stoping in undeveloped ground was as follows:—Main Reef Leader, 64,210 tons; South Reef, 157,344 tons; total, 221,554 tons. Ore Reserves.—The ore reserves at 31st December, 1911, were estimated as follows:—Main Reef, 86,207 tons; Main Reef Leader, 653,208 tons; South Reef, 584,868 tons; Upper Levels, 94,471 tons; total, 1,418,754 tons.

SUMMARY OF ORE TREATMENT ON BASIS OF TONNAGE MILLED.

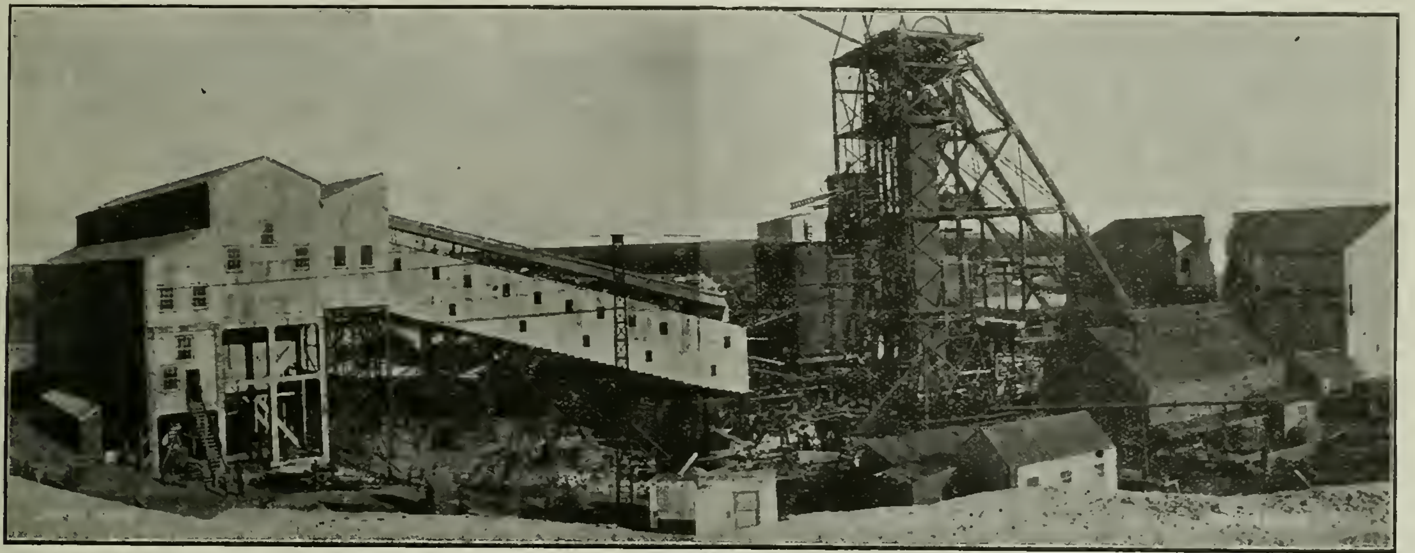
	Total Yield.		Percentage of Total Yield.	Percentage of Extraction.	
	Fine ozs.	Fine dwts. per ton.	%	Theoretical. %	Actual. %
Mill & Tube Mills	143,249·991	6·016	67·583	64·858	64·858
Cyanide Works	68,712·593	2·885	32·417	29·900	31·110
TOTAL ..	211,962·584	8·901	100·000	94·758	95·968

Compared with operations of the preceding year, an increase is seen in the total declared yield per ton milled of .586 dwt. The increase in actual yield is .423 dwts., the difference between declared and actual yield being due to fluctuations in reserve gold. To sum up, the working expenditure and revenue account stood thus:—Total revenue, £889,043 4s. 8d., per ton based on tonnage milled, £1 17s. 4.022d.; total working costs, £429,585 11s. 6d. per ton based on tonnage milled, £0 18s. 0.484d.; working profit, £459,457 13s. 2d., working profit per ton based on tonnage milled, £0 19s. 3.538d. In addition to the above, a profit of £7,771 9s. 2d. was obtained from the treatment of 24,797 tons of accumulations, the results from which were as follows:—Value of yield, £11,841 14s. 7d., per ton treated, £0 9s. 6.611d.; working costs, £4,070 5s. 5d., per ton treated, £0 3s. 3.395d.; working profit, £7,771 9s. 2d., working profit por ton treated, £0 6s. 3.216d. Capital account.—The expenditure was as follows:—Electrification of plant, £1,861 19s. 6d.; electric meter house, £50 1s. 11d.; air meter station, £331 0s. 5d.; air compressor tests, £249 10s. 8d.; erection air meter testing station, £289 12s. 4d.; total, £2,782 4s. 10d. General.—Development.—The total footage for the year was 5,233, developing an estimated tonnage of 221,554 tons of payable ore. Mining.—The serious shortage in the supply of native labour accounts for the decrease in tons mined, and although as many machine drills have been run as possible, it has not enabled us to produce the full tonnage required. Ore reserves.—The estimated tonnage of 1,418,754 payable tons of ore reserves at 31st December, 1911, calls for a recovery of £1 15s. 0d. per ton, or a decrease of 2s. 4d. per ton as compared with the results declared during the year under review. The declared revenue for the year, exclusive of accumulations, shows an increase of 2s. 5.207d. per ton, or £889,043, against £860,839 for the previous year, the actual revenue being an increase of 1s. 9d. per ton. The difference between actual and declared figures is due to fluctuations in reserve gold. The increase of 1s. 4d. per ton in working costs is due to increased in tons milled. Capital expenditure.—The amount expended on this account amounts to £2,782 and is now practically completed. Electrification of plant.—The Rand Mines Power Supply Company, Limited, has not been able to supply electrical power for running the whole plant. Two hoisting engines are still run by steam. Air power has been supplied by the Rand Mines Power Supply Co., Ltd., for the past three months. Native labour.—A shortage of native labour is felt generally on all the mines, and as far as this mine is concerned, the want of labour is seriously affecting work, chiefly underground, and with the number of natives present employed it is impossible to mine sufficient rock to keep both mills running at their full capacity. Future prospects.—The ore reserves show a good grade, and provided there is an adequate supply of native labour, large profits can be looked forward to with every confidence for the current year.

THE SOUTH RAND SORTING AND CRUSHER STATION.

A Unique and Model Plant—Reinforced Concrete Ore Bins—A Capacity of 6,000 Tons Per Day.

The accompanying photograph shows the sorting and crusher station in process of completion at the South Rand, or No. 5 Shaft of the Crown Mines, which will divide with the No. 7 shaft the whole rock output of the huge mine. This station, which is distant nearly a mile from the other, will have a capacity of 6,000 tons per day, as compared with one of 5,000 tons per day at the No. 7, or Western main shaft. The ore bin from which the sorting belts are to be fed is distinctly shown, the next bin below the ground line at the head of the belts being intended to receive the waste rock from the returning portion of the sorting belts. There are four sorting units and three Blake crushers to each belt. The crushers are erected in the central section of the upper portion of the building on the left, immediately over the reinforced concrete hoppers. Two of the crushers in each unit are driven by separate motors built upon the floor, to which entrance is obtained by the stairway shown in the illustration. The third crusher of each set is driven by its own motor upon the floor above. To the right of the staircase will be the railway track leading to the hopper discharge, the doors of which are controlled by compressed air mechanism. The sorting compartment, it will be observed, is well lighted from the roof and sides, and in every respect the whole structure is admirably adapted to the extensive operations which will be carried on at the station.



A View of the Sorting and Crusher Station at the South Rand (Crown Mines).

THE TIN INDUSTRY.

The T.C.L. Tin Interests—Nigerian Capital in the Waterberg—More Appingendam Claims to be Floated.

Not the least interesting part of Mr. H. C. Boyd's speech from the chair at the annual meeting of the T.C.L. Co., on the 3rd inst., was that relating to their various tin interests. An allusion was made to the fact that the mine in the pegmatite zone on the Zaaiplaats lease affords the only instance "of the occurrence of tin in the red granite in this country where it has been possible to actually stope ore on an extensive scale." For the benefit of the non-technical reader, it may be explained that this refers merely to the method of winning the ore, and does not imply that it is the biggest tin ore body discovered in the country, for, of course, the Zaaiplaats mine itself has no rival, so far, in respect of the size of its ore bodies. The big occurrence just discovered on the ground lately leased by the T.C.L. to the Zaaiplaats Company bids fair to make it still more difficult to outrival the latter in the matter of large ore deposits. The remarks upon the hydraulicing scheme at Groenfontein are particularly interesting, and it is to be hoped that the undertaking will result in discoveries which will revive the old glory and profit-making capacity of the property. "You will notice," said Mr. Boyd, "that during the past year most of the payable ore exposed on the Zaaiplaats lease was crushed at the Groenfontein battery, materially reducing the total expenditure on this property up to the end of the year. Prospecting by means of diamond drilling was begun at the beginning of this year, and encouraging values were located at a point 100 feet on the dip of the vein from which the ore crushed last year was stoped. Driving from a winze towards this point is now proceeding. Stoping operations were resumed in May with encouraging results. The stope faces are at present looking remarkably well, carrying a large body of high-grade ore, but how far the present values will continue it is, of course, impossible to say. It is clear, however, that they have only to continue a comparatively short distance to enable us to recover the total expenditure on the lease. It is hoped that, when a considerable body of ore has been stoped, arrangements can be made for further crushing at the Groenfontein battery. This is the only instance, I believe, as yet, in the occurrence of tin in the red granite in this country where it has been possible to actually stope ore on an extended scale. A tributing lease was granted last month to the Zaaiplaats Tin Mining Company, Ltd., over about twenty-one acres of the farm 'Roodepoort,' immediately adjoining that company's own claims. Under this lease our company receives the satisfactory proportion of two-thirds of all ore won, free of cost. Our reason for granting the lease of this ground was that it is situated so far from our own workings that the cost of supervision would be unduly high, and that we did not feel justified in carrying out any considerable amount of dead work on it. An ore body has now been opened up by the lessors on this lease, and it is hoped that a fair tonnage will result as our share. The ore mined will be treated in due course at the Groenfontein battery.

GROENFONTEIN.

“ As you will have seen, the profit earned at Groenfontein during the past year has greatly decreased, compared with previous years' results. Generally speaking, all the various tin occurrences have become greatly impoverished, and during the past six months we have not been able to do more than cover current expenditure, which has, however, included a large amount of exploratory work, undertaken with a view to locating further profitable ore bodies. Since February, the mill has only been run on day shift, and the monthly output has averaged about 19 tons of concentrates. Of late, the monthly results show improvement, and while there has been no discovery of marked importance, there are encouraging indications at various points, and, in addition, we are preparing to treat a larger quantity of the accumulated slimes. We can, therefore, see our way clear, at the worst, to meet all expenditure, including that of exploratory work on a considerable scale, for some months to come. Naturally, in the event of any important discovery being made, the whole aspect would be changed, and milling to the full capacity of the plant would be resumed. With regard to the heavy capital expenditure on the hydraulicing plant, it is evident that were it not for this scheme we should have to be constantly stripping the overburden by hand to lay bare the granite in the hope of discovering more tin-bearing pipes (this being the only way in which our phenomenally rich discoveries in the past were made). If the money now being spent per month on hydraulicing this overburden were devoted to hand stripping, the result from past experience would be that in any case it would take twice the time to do the same amount of work, whilst we should not be recovering the tin in the soil, which, on the average, should just about cover the working expenditure. Consequently, what we shall save on the cost of hand-stripping will go a long way, at any rate, to repay the capital outlay on plant, the work will be done in half the time, whilst the plant itself will, with some additions, be still available for working the valley alluvial as soon as the hill sluicing has been completed. From our past experience of this property, it would seem more than likely that in the course of the active development programme now being carried out—I may mention that last month 475 feet of underground driving and sinking were accomplished—combined with the extensive stripping of overburden by the hydraulic sluicing, we shall encounter ore bodies similar to some of those rich deposits met with in the past.

GOOD PROSPECTS TO THE SOUTH-WEST.

“ On Witfontein No. 371 and Newbury No. 937, Waterberg, driving and sinking have continued. Good tin values have been located in a shaft to a depth of 90 feet on the lode to which Mr. Garrard refers, which then dipped out of the shaft, which is being continued to a depth of 150 feet, from which level it is proposed to crosscut to and open up the ore body. The prospects of the tin occurrence now being worked are considered to be good and more encouraging than anything hitherto previously located on these farms. There is nothing further to report about Weynek No. 763, Rustenburg. The results of last year's working, as you see, were extremely disappointing, and it was decided to do no further work until such time as it may appear advisable to extract and mill the tonnage already developed, when we may feel justified in continuing further work in depth. The Weynek Tin Company, which held a lease of portion of this farm, has gone into liquidation, and the lease has been cancelled.

LEEUWPOORT.

“ The Leeuwpoort (African Farms) Tin Mines, Limited, was floated during the year with a capital of £275,000, in £1 shares, when we became the owners of 43,229 shares in all in this company. The very satisfactory ore reserves of this property at 31st December, 1911, as reported by the African Farms, Limited, are recorded in our engineer's report. Active development has been proceeding, and considerable additions have been made this year to the tonnage developed. The ordering of a reduction plant is now under consideration. I understand that Mr. S. Thomson, consulting engineer to the company, considers that the position fully warrants the erection of a plant capable of treating 150 tons a day, so arranged as to permit of economical extension. In the opinion of Mr. Garrard, who recently visited the property, the prospects are decidedly encouraging, and point to the eventual opening up there of more than one payable tin mine.”

NIGERIA AND THE WATERBERG.

The indifferent success which has followed upon the flotation of various companies operating in the Nigerian tin field, has turned the attention of some of them to the Waterberg, where, as we have already announced, at least one Nigerian company has acquired large areas, and proposes to commence exploratory work at once. It is considered not unlikely that it will be followed by others that have an unexhausted working capital available for more attractive schemes. A large block of ground on Appingendam, lying west of the Bay Tree tin area, is reported to have been taken over for flotation in Germany by a local representative of some capital in that country. The ground, we believe, is that known as the Transvaal Bay Tree blocks, and comprises some 1,200 claims.

Glynn's Lydenburg.

The directors' report for the quarter ending 30th April, 1912, states: Number of feet driven, sunk, and risen, 2,452 feet; ore mined, 9,006 tons; ore crushed, 9,079 tons; number of days (24 hours) working an average of 20 stamps, 82.584 days; crushing duty per stamp per 24 hours, 5,496; yield in fine gold, 1,742.433 ozs.; yield per ton in fine gold, 3.838 dwts. Sands treated, 5,905 tons; slimes treated, 3,175 tons; total 9,080 tons. Sands yield, 1,862.362 fine ozs.; slimes yield, 1.546.978 fine ozs.; total. 3,409.340 fine ozs. Sands yield per ton treated, 6.307 fine dwts.; slimes yield per ton treated, 9.744 fine dwts.; total, 7.509 fine dwts. On basis of tonnage milled, the mill yielded 1,742.433 fine ozs., or 3.838 fine dwts. per ton and 33.822 per cent of total yield. In the cyanide works, sands yielded 1,862.362 fine ozs, or 4.102 fine dwts. per ton, and 36.149 per cent. of total yield; and slimes yielded 1,546.987 fine ozs., or 3.407 fine dwts. per ton and 30.028 per cent. of total yield; total cyanide yield, 3,409.340 fine ozs, or 7.510 fine dwts. per ton, and 66.177 per cent. of total yield. Grand total of yield, 5,151.773 fine ozs., or 11.348 fine dwts. per ton. Total working expenses, £9,474 16s. 11d., or £1 0s. 10.464d. per ton milled; working profit for the quarter carried down, £12,256 6s. 9d., or £1 6s. 11.991d. per ton milled; total £21,731 3s. 8d., or £2 7s. 10.455d. per ton milled. General expenses (European and Head Office), £1,303 12s. 9d.; profit for quarter, £11,669 17s. 5d.; total, £12,973 10s. 2d. Balance brought down, £12,256 6s. 9d.; interest account, £131 8s. 11d.; sundry revenue, £585 14s. 6d.; total, £12,973 10s. 2d. The estimated tax on profits for the quarter has amounted to £1,148 18s. The capital expenditure for the quarter has amounted to £515 1s. 8d. In deference to the wishes expressed by shareholders and others, it has been decided to discontinue the carrying of reserve gold. In future the actual results will be declared, and shareholders must realise that variations in the amount of profits may occur from month to month. Any circumstances entailing abnormal results will be explained when the monthly profits are declared. The decreased profit for the quarter is primarily due to the increased cost of mining at the Werf Mijnpacht. Enquiries were made during the quarter as to the reasons for the fall in the price of the company's shares, and a statement was published both in London and Johannesburg that this was probably due to local rumours regarding the life of the mine. The Government Mining Engineer estimates the life of the mijnpacht at a further six years, which estimate our manager considers is conservative. The future of the company largely depends on the development of the Werf Mijnpacht, which has an area of 342.7 claims, or only 31 claims less than the mijnpacht. Good average ore is being developed here, but too little work has been done as yet to permit estimates being made of future values. The prospects, however, are, in the opinion of the manager, distinctly encouraging.

EXTRACTION RESULTS AND REDUCTION COSTS.

Comparative Data from Several Annual Reports—Difficulty of Obtaining Complete Data—High Extraction and its Relation to Profits.

Several months ago we gave a brief list of the extraction results obtained at a fairly representative group of mines, of which the annual reports were then available. It is not easy to draw up a complete tabular statement with regard to all the producing mines, or even with regard to the more prominent among them, on account of the different ways in which results are recorded, and, in some instances, of the inadequate information supplied. The following table is a more elaborate one than that previously presented, and, for the reasons given, it has been prepared at the cost of some little trouble. No particular choice of mines has been made, and no invidious comparisons have been aimed at in the selection, which has been the result of a chance examination of annual reports to some extent. The figures are sufficiently representative, nevertheless, to be of considerable interest. They give details concerning the money percentages and reduction costs of mines of which the capacity ranges from 120 to 820 stamps, while the sand charge values are found between 1·83 dwts., as at New Modderfontein, to 3·99 dwts., as at the East Rand Proprietary Mines. The values of the slime and sand charges are, in several instances, given together, of necessity, as already explained.

MINE. (See Annual Reports.)	Tons milled and Assay value of Mill Ore.	Milling.			Cyanide Treatment.						Total Extract.
		Stamps number & Duty	Tube-mills,	Am'lg'm Extract.	Tons Treated.			Charge.	Residue	Actual Extract.	
			number	%		Tons.	%	dwts.	dwts.	%	%
Wolhuter G.M. Co., Ltd.	344,015	120	3	63·76	Sand	226,265	65·77	2·89	·508	84·13	94·61
1911	6·71 dwts.	8·47			Slime	117,750	34·23	1·58	·200	87·78	
East Rand Prop. Mines, 1910	2,126,334	820	25	50·11	Sand	1.278,814	60·12	3·99	·647	84·78	92·85
	7·01 dwts.	7·82			Slime	847,920	39·88	2·52	·293	87·53	
Ditto 1911	2,194,552	820	25	50·81	Say Mill Tonnage			3·23	·432	83·90	92·02
	6·58 dwts.	8·23									
New Kleinfontein Co., 1909	454,945	220	—	63·04	Sand	303,032	66·6	2 71	·43	84·1	94·06
	7·34 dwts.	5·99			Slime	151,647	33·3				
Ditto 1910	466·882	220	—	63·06	Sand	318,443	68·2	2·61	·39	85·5	94·50
	7·06 dwts.				Slime	148,569	31·8				
Ditto 1911	451,145	220	—	59·78	Sand	310,436	69·0	3·05	·56	81·6	92·67
	7·58 dwts.				Slime	140,709	31·0				
New Modderfontein G.M. Co.,	538,400	180	5	74·7		539,262		1·83	·24	88·1	97·0
1911	7·22 dwts.	9·1									
Knight Central, Ltd., 1911	315,171	120	3	68·18	Sand	192,440	60·8	1·84	·28	86·52	95·6
	5·81 dwts.	9·14			Slime	124,048	39·2				
Nourse Mines, Ltd., 1911 ..	643,675	260	6·3	69·6		645,440		2·24	·375	83·2	95·1
	7·30 dwts.	7·6									
Crown Mines, Ltd., 1911..	1,618,500	620	16·9	68·5		1,616,941		2·73	·403	87·5	96·0
	8·68 dwts.	8·8									

MINE. (See Annual Reports.)	Reduction Costs (per ton milled).							Remarks.
	Sorting, Crushing, etc.	Milling.		Cyaniding.		General Expenses.	Total.	
		Stamp.	Tube.	Sand.	Slime.			
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
Wolhuter G.M. Co., Ltd., 1911	0 11·37	2 2·71		1 1·04	0 4·16	0 11·33	5 6·6	
East Rand Proprietary Mines, 1910 ..	Not Specified, total 4s. 11·6d.					0 6·2	5 5·8	
Ditto 1911	Not Specified, total 4s. 8·8d.					0 5·9	5 2·7	
New Kleinfontein Co., 1909	0 8·96	1 3·39	—	0 11·06	0 3·21	0 9·69 Maintenance 0 9·86	4 10·17	No Tubemills.
Ditto 1910	0 10·55	1 8·28	—	1 0·38	0 3·41	0 8·11	4 6·72	No Tubemills.;
Ditto 1911	0 10·90	1 7·07	—	1s. 5·41d.		1 5·47	5 4·85	No Tubemills.
New Modderfoutein G.M. Co., 1911 ..	0 5·0	1 0·0	0 8·0	1s.	9·0d.	1 7·2	5 5·0	Butter's Filter.
Knight Central, Ltd., 1911	0 6·20	1s. 11·60		1s.	4·44d.	1 2·71	5 0·95	
Nourse Mines, Ltd., 1911	0 5·0	1 7·0	0 7·0	1s.	10·0d.	1 7·0	6 0·0	
Crown Mines, Ltd., 1911	0 8·0	1 4·0	0 7·0	1s.	7·0d.	1 8·0	5 10·0	Butter's Filter (End of year.)

It is difficult to enter into a discussion of the points suggested by the figures without the assistance of a good deal more of data than is conveniently accessible; as, for instance, whether the cost of increased extraction is warranted by the profit actually obtained when compared with the profit obtainable on a lower extraction basis, the incidence of interest on capital and wear and tear being taken into consideration. With these few preliminary remarks, therefore, we leave the comparative statement to those to whom it is likely to be of interest.

THE CAMPAIGN AGAINST PHTHISIS.—III.

Instructive Account of Efforts Made to Combat the Evil at the Simmer Deep.

The following instructive letter from Mr. H. S. MacGregor to the Inspector of Mines, Germiston, was handed in to the Select Committee on Phthisis :—

As desired by you, I beg to submit a report on the work done on the Simmer Deep towards improving the health conditions as far as ventilation and dust allaying is concerned. Ventilation.—In July, 1911, a Sirocco Fan, capable of exhausting 350,000 cubic feet per minute at a ventilating pressure of 5in. water gauge, was installed. This fan was placed at the Rudd Shaft which was the natural downcast shaft, and in consequence of which, at the commencement of running the fan, the abnormally high water gauge of 6¾in. was recorded, which, however, has gradually come down to 4in. One of the reasons for selecting this as the upcast shaft was that no men travel in it. The main hauling shafts are the Clement and Milner, and those are both downcast, consequently men after blasting enter into shafts in which there is no smoke, and comparatively little dust. In order to prevent those shafts from becoming dry, owing to the passage of large quantities of air, water rings were placed in them and water allowed to drop continually, the walls of the shafts thus being kept moist and the air itself being incidentally charged with a certain amount of moisture. In mechanical ventilation, precautions have to be taken to ensure that very large quantities of air do not pass through the principal working air ways in the mine, and in order to effect this, the mine is split up into five distinct air sections or splits. The fact of splitting the air currents besides reducing the velocity of the air passing, and consequently the power required in producing ventilation, also has the beneficial effect of sending the pure fresh air to a greater portion of the workings. At present the fan passes 200,000 cubic feet per minute which is quite sufficient for our requirements, but in the future, should more air be required, the fan is quite capable of dealing with it. The following figures show to a certain extent the benefits which have already been obtained :—

Ventilation before Installation of Fan.	Ventilation after Installation of Fan.
105,700 cubic feet per min.	At July, 1911, 182,700 cu. ft. per min Now nearly 200,000 cu. ft. per min.

Temperatures, June, 1911.

Stope 18-14	82°	F. Dry	Bulb.	79½°	F. Dry	Bulb.
	81½°	F. Wet	,,	78°	F. Wet	,,
Upcast Shaft	77°	F. Dry	,,	71°	F. Dry	,,
	75°	F. Wet	,,	70°	F. Wet	,,
21st Level	82°	F. Dry	,,	74°	F. Dry	,,
	80°	F. Wet	,,	71°	F. Wet	,,
23rd Station	84½°	F. Dry	,,	80°	F. Dry	,,
	83°	F. Wet	,,	78°	F. Wet	,,

Average of Wet Bulb prior to Fan Ventilation 80° F.
,, ,, ,, after ,, ,, ,, 74° F.

The question of temperature has an important effect on working efficiency, and it has been determined that when the wet bulb thermometer registers over 80° F. (Haldane) the working efficiency is reduced. It should be noted in the above temperature records that the 21st level is our lowest stoping level—vertical depth 3,939 feet, and that the low temperature recorded is due to the fact that the air is conducted directly down the incline shaft to that point, and from there ascends through the working places back to the upcast shaft. Another point which should be noted is the reduction of 4½° temperature of our lowest (23rd) developing level, as this point is about 540 feet below our main air circuit. It would seem that although the air is not actually conducted there, still a reduction of air temperature is induced, and most probably the air is rendered more pure. A factor of importance in reducing temperature is, I consider, the evaporation of water used for dust allaying purposes in stopes. In order to ensure that the air passes in close proximity to where men are working all disused stope boxes are blocked up, the effect of such stoppages being immediately noticed by the men working there.

Vitiation of Air (Mr. A. McA. Johnston).—Tested by the amount of carbon dioxide (CO_2) in mine air. The figures showing the difference in CO_2 contents before and after fan ventilation are difficult to give owing to the different system now employed. Previous to fan ventilation the back stopes and drives were badly ventilated, being dependent on exhaust air from machines and the vagaries of natural ventilation. I may quote one of the main air ways in the Jupiter as containing in 1907, 0.57 of CO_2, whilst in January, 1912, in sampling the "dead ends" as specified by Government Regulations '11 (59), the average of these—admittedly usually the worst places—in the Simmer Deep was 0.15 of CO_2, and the upcast air in the shaft 0.17 of CO_2. The air from the Jupiter entering the Simmer Deep on the 14th level contained, prior to fan ventilation (on June 12th, 1911), 0.31 of CO_2 as against 0.20 of CO_2 on September 21st, 1911—three months after the fan started. The fan ventilation therefore at the Simmer Deep improved conditions in this section of the Jupiter.

Dust allaying.—Our greatest initial difficulty in recording progress in tackling the question of dust allaying was to obtain a reliable method of measuring the quantity of dust in the air. Mr. A. McA. Johnston conducted a series of experiments in order to obtain the most reliable method. He aspirated a known quantity of air using sugar, water, glass wool, and cotton wool, as the filtering media, and found that the most satisfactory method was to aspirate the air through a small funnel (separator) charged with crystallised sugar (+60 mesh). Result of dust determination in drift leading to a fan at the top of the upcast shaft :—

	Time of Sampling Sept. and Oct., 1911.	Mineral Matter Grms. per cubic meter.	6th April, 1912.	Mineral Matter. Grms. per cu. meter.	Reductions. per cent.
1	9–10 a.m.	0·28	9–10 a.m.	0·032	88
2	11.30–12.30 p.m.	0·13	11.30–12.30 p.m.	0·021	84
3	2–3 p.m.	0·08	2–3 p.m.	0·039	51
4	4.15–5.15 p.m.	0·10	4.15–5.15 p.m.	0·014	86
	Average	.. ..	.. ..	.. ..	77

In the September and October, 1911, results it will be noted that the amount of dust was greatest between 9 and 10, this being probably due to the amount of dust raised in the mine by shovelling in the stopes. In the April, 1912, reading, No. 1, the amount of dust in the atmosphere is only a ninth part of the previous results at the same hour of the day, the difference being probably due to the effect of having the stopes watered at night time. The result in No. 4 (April, 1912) may be unreliable, as during two-thirds of the time of taking the sample the fan was stopped, with consequent diminution of the velocity of upcast air. The methods taken to prevent the presence of dust in the mine air may be summarised as follows :—1. Use of water in collaring and drilling of holes. 2. Use of sprays in drives and shafts. 3. Spraying of working places during the night. 4. Sufficient water storage underground. After experimenting with a great many atomisors or sprays, we find that the acetylene burner, No. 28 Roni Burner, working under sufficient water pressure, gives the most favourable results, the spray produced not being so fine as that produced by the combined use of compressed air and water, but finer than that produced by means of other atomisers tried. Those sprays are placed in the drives all over the mine, and just before blasting commences the water is turned on and allowed to play until the men and natives employed on watering the stopes come on duty at night, who then turn them off. At first we tried them placed round the perimeter of the drive, but found afterwards that two sprays are quite sufficient to fill the drive with a finely-divided spray. At the entrance to the Clement incline shaft a series of sprays are placed to arrest any dust that may be formed by the abrasion of rock falling down the ore chutes in the shaft from passing into the workings of the mine. In all development drives at least two sprays are placed, and also near the entrance to stopes to arrest the dust generated at blasting time. A white man in charge of a gang of boys is responsible for the watering of all stopes at night time. There is sufficient dam capacity underground for a 24 hours supply of water, the water used being partly mine water and partly water brought from the surface. All determinations of CO^2, and dust in air were made under the supervision of Mr. A. McA. Johnston, Metallurgical Chemist, Consolidated Gold Fields Laboratory."

Kolmanskop Diamonds.

The output of diamonds from the Kolmanskop property at Luderitzbucht for the month of June was 10,003 carats.

Roberts Victor Diamonds.

The following is the output of the Roberts Victor mine for the month of June: 16,344 loads washed, producing 6,187 carats of diamonds.

Harmony Proprietary.

The Harmony Proprietary report that mynpacht briefs for 850 claims selected on farm Aken, and for 1,050 claims selected on farm Dusseldorf, have now been issued to company by the Transvaal Government, being mining leases for 20 years, renewable, to which the company is entitled as owner. Similar mining leases, covering 2,370 more claims on two other farms, are about to be issued.

DIVIDENDS FOR THE HALF YEAR.

Rand Shows a Pronounced Diminution for the Period—The Question of Policy and Working Costs—Apathy in the Sharemarket.

The dividend list for the first half of 1912 makes it evident that the total for the year will, in all probability, be materially lower than that for 1911. The entry of the Bantjes Consolidated and the Brakpan Mines into the list of dividend payers, with a sum of £137,615 between them, has prevented a drop in the six months' returns, as compared with those for the first half-year of 1911, of nearly half a million. By a little statistical ingenuity it can, of course, be demonstrated that things are not nearly as bad as they look on paper, and those who are acquainted with the progress of mining upon the Rand will be quite ready to admit that the dividend list just published is not altogether a fair presentment of the actual condition of the industry. A good deal of capital expenditure has been necessary, and profits have been drawn upon to meet it to a considerable degree. Partly in consequence, there has been a heavy falling off in the case of several of the aggregate group declarations, as may be seen from an examination of the accompanying tabular statement, which covers the last five half-yearly announcements. The diminished dividends of the Anglo-French group naturally attract first attention, but others are, in their way, no less conspicuous. The Goerz dividends, for instance, owing to the temporary disappearance of the Princess Estate from the list, coupled with the reduction in the May Consolidated declaration, have decreased by about 50 per cent. The Gold Fields have dropped considerably, in spite of the fact that the Jupiter has come in with a dividend amounting to £25,355. The Robinson group have had a big fall on Langlaagte Estates, and Albus on New Gochs. On the other hand, the Barnatos have had an all-round improvement, which is particularly gratifying. Neumanns, also, have made prominent advances, notably in the Consolidated Main Reef, Wit. Deep, and Wolhuter dividends, and have, moreover, the distinction of showing material improvement during the three first half-years shown upon our list:—

Group.	1910. First Half. £	1910. Second Half £	1911. First Half. £	1911. Second Half. £	1912. First Half £
Albu	216,750	193,750	193,750	180,000	162,500
Barnato	172,875	265,375	172,875	351,379	212,125
Eckstein-Rand Mines	2,111,432	2,137,547	2,044,331	2,002,793	2,004,030
Farrar—Anglo-French	602,429	578,179	586,179	317,339	378,487
Goerz	84,250	84,250	86,502	57,750	43,312
Gold Fields	546,528	537,616	562,617	496,528	480,796
Neumann	259,901	370,968	281,664	191,002	294,557
Robinson	280,425	280,425	86,950	43,475	43,475
Consolidated Mines	—	—	—	—	112,500
Miscellaneous	76,877	75,500	67,949	40,000	12,500
	4,351,467	4,523,610	4,082,817	3,680,266	3,744,282

Under the heading "miscellaneous" the falling-off has been emphasised by the disappearance of the Champ D'Or, Jumpers, and Salisbury from the list, and the lowering of the Durban Roodepoort dividend by exactly half.

While not being in agreement with those who profess to see red ruin in the reduced dividend aggregate, it must be admitted that the figures tend to confirm the impression of a weakening of the Rand's capacity to pay out profits. At the end of last year we remarked upon the apparent fact of diminishing capacity in this direction as a result of the labour stringency, and of a policy which had not been constructed with a view to meeting the difficulty. Unskilled labour lies, pretty largely, at the bottom of the whole position, and until the various schemes now in course of elaboration for the purpose of obviating the difficulty of inadequate supply and inefficient quality have more or less matured, it will be impossible to say how this profit-making capacity is going to shape itself. In the meantime, working costs are not growing less; they are, as a matter of fact, becoming higher, and it is not easy to explain the circumstance entirely on the grounds of the quantity and quality of native labour. It was expected that the new ideas and methods introduced to the Rand from the colliery districts of England would have shown some definite results on the side of economy, but so far the evidence in their favour is not as emphatic as might reasonably have been expected, in view of the length of time during which they have been in vogue. It may, doubtless, be argued that with other policies running simultaneously with that of the colliery methods policy—such, for example, as the cleaner stoping and fathomage scheme of mining—the results have been difficult to analyse, inasmuch as they have been influenced by somewhat conflicting factors. It may, indeed, be contended that if Rand gold mines, especially those of the deeper levels, do not respond satisfactorily to efforts based upon principles which are admirably adapted to them under fair conditions, it is merely a case of "so much the worse for the mines." At the same time, some reassuring statement upon the question of existing mining policies, apart from the obviously proper one of concentration as now being applied at the Crown Mines and other properties, would not be inopportune at this moment.

THE ATTITUDE OF THE INVESTOR.

In the meantime, the European investor looks with apathy upon the Rand, and business in the local sharemarket may be said to be non-existent. It would be erroneous to suppose that the buyer of shares stands aloof because he believes the industry to be toppling over. On the contrary, the probability is that he is rather dissatisfied with the prospects of steady earnings and humdrum progress in the future. The quotation from *Punch* which we gave last week is, like much of that paper's restrained and dignified humour, intended to emphasise an observed fact. It is a fact which has been remarked upon quite as emphatically in technical and financial magazines, and none more pointedly than by Mr. W. H. Goodchild, who is, doubtless, well known to most of us as a writer upon mine valuation. In a recent issue of *The Mining Magazine*, he criticises Mr. M. H. Burnham's articles on "The Finance of a Mine" on the grounds that the latter has failed to recognise that the mining financier or investor does not base the conduct of his affairs on close calculations of a risk rate. "The value of a speculative investment," Mr. Goodchild protests, "depends primarily and principally upon the prospect of gain, whereas the risk of loss is nothing more than a secondary or modifying factor. The gain may come by way of an increment in capital value at any time, even suddenly or unexpectedly, as a result of one or more of the many factors which are operative in connection with mining work. The possibilities of rapid capital increment are necessarily reflected in the rates of interest yielded by mining investments. . . . If the risk of loss were such an important point in matters of mining investment valuation as Mr. Burnham would lead us to suppose, then I venture to suggest that the mining industry would be in a perpetual danger of slow extinction." In other words, the chance of gain is a much more important consideration than the certainty of avoiding loss—speculation, not investment, is the life of the mining market.

Coal and Other Dividends.

By way of completing the list of dividends published in our last issue, we add the following statement regarding other industrial undertakings:

COAL COMPANIES.

COMPANY.	Issued Capital, June, 1912.	Dividends Four Half-Years.				Amount Distributed.		Increase.	Decrease.
		Dec., 1910.	June, 1911.	Dec., 1911.	June, 1912.	June, 1911.	June, 1912.		
	£	%	%	%	%	£	£	£	£
Apex	300,000	5	5	5	5	15,000	15,000	—	—
Cassel	200,000	—	5	6¼	—	10,000	—	—	10,000
Clydesdale	180,000	—	5	—	5	9,000	9,000	—	—
Coronation	83,000	—	6	—	6	4,980	4,980	—	—
Middelburg (Pref.)	65,000	5	—	5	—	—	—	—	—
Middelburg (Def.)	88,159	6	—	9 + 1	—	—	—	—	—
Transvaal Coal Trust ..	545,760	5 + 1¼	—	7½	7½	—	40,932	40,932	—
T'vaal and Del. Bay Inv't Co.	185,000	12½	—	15	—	—	—	—	—
T'vaal-Navigation Coal Est.	120,000	—	—	—	3¾	—	4,500	4,500	—
Witbank	210,000	20	15	15	15	31,500	31,500	—	—
East Rand Gold, Coal & Est.	47,554	10	—	10	—	—	—	—	—
TOTALS	—	—	—	—	—	70,480	105,912	35,432	Net. Incr.

a Middelburg distributed 9 per cent. in cash, and bonus of one per cent. in scrip.

DIAMOND COMPANIES.

Premier Preferred	10,000	125	125	125	125	50,000	50,000	—	—
Premier Deferred	40,000	—	200	300	300	80,000	120,000	40,000	—
TOTALS	—	—	—	—	—	130,000	170,000	40,000	Net. Incr.

TIN COMPANIES.

Rooiberg Minerals	180,000	—	7½	7½	7½	13,500	13,500	—	—
Swaziland Tins	82,000	7½	7½	5	5	6,150	4,100	—	2,050
Zaaiplaats	60,000	30	50 + 50	60	—	60,000	45,000	—	15,000
TOTALS	—	—	—	—	—	89,650	62,600	Net. Dec.	17,050

FINANCIAL, INDUSTRIAL AND LAND COMPANIES.

Adair-Usher	53,437½	2½	2½	3d. per share	—	1,336	—	—	1,336
Anglo-French Exploration ..	1,000,000	—	7½	—	—	75,000	—	—	75,000
Central Minings	5,100,000	—	6s.	—	—	90,000	—	—	90,000
Cons. Gold Fields, 1st Pref...	1,250,000	6	3	3	3	18,750	18,750	—	—
Cons. Gold Fields, 2nd Pref.	1,250,000	—	—	6 (9 months)	3	—	18,750	18,750	—
Cons. Gold Fields, Ordinary	2,000,000	25	10	15 + 5	7½	200,000	150,000	—	50,000
Elandsfontein Estate ..	30,000	5	5	5	5	15,000	15,000	—	—
Grand National Buildings ..	25,000	—	—	5	—	—	—	—	—
General Mining & Finance	1,875,000	—	7½	—	—	140,625	—	—	140,625
Gold Mines Investment ..	500,000	5 + 2½	—	10	—	—	—	—	—
Johannesburg Cons. Invest.	3,950,000	—	7½	—	5	296,250	197,500	—	98,750
Johannesburg Estate ..	200,000	—	2½	—	2½	5,000	5,000	—	—
Kleinfontein Estates ..	85,000	22½	10	10	5	8,500	4,250	—	4,250
New Era Cons.	100,000	10	—	—	—	—	—	—	—
New Steyn Estate	300,000	—	—	—	—	—	—	—	—
Oceana Cons.	1,000,000	—	5	—	—	50,000	—	—	50,000
Rand Mines	531,499	110	110	110	110	584,649	584,649	—	—
Real Estate Corp., S.A. ..	150,000	—	5	2½	—	7,500	—	—	7,500
S.A. Gold Trust (Ordinary)	500,000	—	7½	—	—	37,500	—	—	37,500
S.A. Gold Trust (Preferred)	500,000	—	6	—	—	30,000	—	—	30,000
S.A. Real Estate Trust ..	150,000	2½	—	—	—	—	—	—	—
Wit. Townships	200,000	10	—	—	—	—	—	—	—
Pretoria Cement	150,000	—	—	—	20	30,000	30,000	—	—
TOTALS	—	—	—	—	—	—	—	—	—

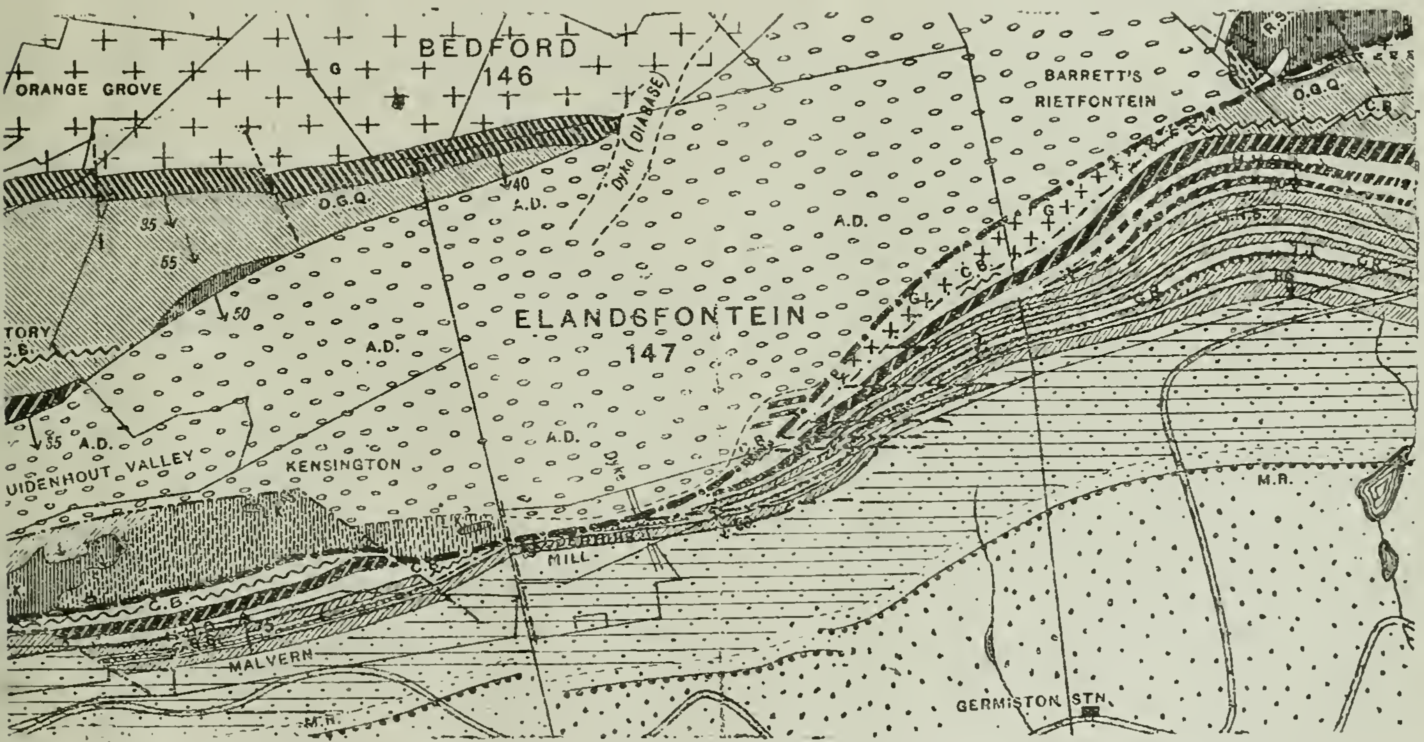
THE RAND GEOLOGICAL CONTROVERSY.—III.

Mr. J. S. Olver's Criticism of Dr. Mellor's Views—Conclusion and a Challenge to Critics.

I CONTEND that the generally-accepted tracing of the beds from the Geldenhuis mill to Barrett's Rietfontein is so faulty that it conveys a wrong impression of the whole geology of this area, and I am prepared to uphold this contention in the field. Drs. Hatch and Corstorphine identify the quartzite bed, on the northern edge of which the Geldenhuis mill stands, as the Hospital Hill Quartzites (a correlation which I consider to be indisputable), and they represent this bed as running slightly north of north-east from that point. Dr. Mellor does not accept this correlation, but he makes the Hospital Hill Quartzites run very nearly north-east from about the middle of Elandsfontein. Now, I maintain that the general strike of all the beds in the southern ridge on Elandsfontein, neglecting mere local folding, is much more nearly east and west.

In his later map Dr. Mellor shows three beds on the north-west side of the "Rietfontein Fault," which I take to include the kopje, referred to above, which he describes as a projection of the Hospital Hill Quartzites into the flat. The strike of these beds is shown to be very slightly north of east. Now, I judge that to be the general strike, not of an isolated patch, but of the whole formation in that neighbourhood. No one who stands on the crest of the ridge at a point about half-a-mile south-west of the kopje referred to above can well fail, it seems to me, to recognise that the general trend of the formation is as I have described. It would, in fact, be much more natural to join up the quartzites in and to the east of this kopje with the Hospital Hill Quartzites at the Observatory than with those at the Geldenhuis mill. The true strike is very nearly parallel to that of the Main Reef, and also agrees with Dr. Mellor's tracing of what he calls the Government Reef. This tracing has a very important bearing on my argument, and I purpose to deal with it at some length.

I referred above to the squeeze which is supposed to have eliminated, on the east side of the semi-transverse fault just west of the Geldenhuis mill, a great thickness of the beds which ordinarily lie below the Government Reef. I dealt with this supposed elimination in "Faults and Dykes," and denied that there was any valid reason for believing that the quartzites, on the lower margin of which the mill stands, belong to the Government Series. They not only maintain the normal relation of the Hospital Hill Quartzites to the admitted Contorted Bed, but they present all the usual characteristics of those quartzites. In the appendix to his second paper, Dr. Mellor refers to the Government Reef as follows: "Bottom few feet usually pebbly, with a well-defined pebble band forming the foot of the quartzite and resting directly on the shale below *without transition beds.*" The italics are mine. Again, on page 106, he says in referring to the same reef: "The most characteristic feature of this horizon is not so much any peculiarity of the reef itself as the manner in which it almost invariably lies directly on the shale below, and even when the pebble bed is absent the same sharp junction of the shale with the quartzite is seen." Dr. Mellor gives sufficient emphasis to this feature, and I agree with him that it is a constant characteristic of the Government Reef. But how does it apply to the reef at the Geldenhuis mill? It would be hard to improve on his own words to indicate the difference between that reef and the Government Reef; while, on the other hand, his description of the junction between the Hospital Hill Quartzites and Shales describes the conditions at the Geldenhuis mill very aptly.



Portion of Dr. Mellor's Map of the Central Rand. *Trans. Geol. Soc. of S.A., Vol. XIV.*, 1911.

The beds which overlie the quartzite under discussion are not well exposed, but highly-magnetic red shales, separated by bands of quartzite, can be proved to extend well to the south; and this is just what one would expect to find above the Hospital Hill Quartzites, but not above the Government Quartzites. One might give more detailed evidence to prove that these quartzites are the Hospital Hill Quartzites, but, after all, the burden of proof to the contrary is on Dr. Mellor; and when he has to assume the elimination of some 7,000 feet of the formation in order to explain the supposed juxtapositon of the Government Reef and the Contorted Bed, it seems unnecessary for me to amplify my evidence. I will merely repeat that I do not see the slightest cause to doubt that these quartzites are the Hospital Hill Quartzites and that the reef which lies at their base is what I have called the White Reef.

This reef, mistaken by Dr. Mellor for the Government Reef, is shown on his map to be traceable without any serious break on to and through Barrett's Rietfontein. In a section through that farm the quartzites of which this reef forms the base would be found to lie just over 3,000 feet to the south of the base of the quartzites which Dr. Mellor identifies as the Hospital Hill Quartzites. If, then, my identification of the quartzites at the Geldenhuis mill is correct, and if Dr. Mellor's tracing of them to the east is also correct, the true position of the Hospital Hill Quartzites in the Barrett's Rietfontein section must be over 3,000 feet further south than he has made it. This would be another strong argument in favour of my correlation of the northern quartzites with the Orange Grove Quartzites, but I think it can be shown that Dr. Mellor's tracing is a little too favourable to me. He has, in fact, linked up the bed which he took to be the Government Quartzite at the Geldenhuis mill with the true Government Quartzite on Barrett's Rietfontein. The bed with which the former should have been connected is that which Dr. Mellor describes as the "Coronation Quartzite," in which the old quarry with the vertical boiler to which he refers is situated. I, of course, maintain that these are the real Hospital Hill Quartzites.

As a matter of fact, the tracing of the quartzite eastwards from the Geldenhuis mill is not quite as easy as Dr. Mellor's map seems to indicate. It is quite simple for the first mile or two, and I accept his tracing to a point beyond the Simmer and Jack cemetery. The red magnetic shales to the south confirm the tracing of the Hospital Hill Quartzites. These shales can be seen near the north-western corner of the cemetery, and they suggest that the Government Quartzites, if undisturbed by faulting, should underlie the cemetery. Beyond this point, the beds are much disturbed, probably by a series of faults which enter the formation obliquely from the west and pass upward through it as they go east—much as Dr. Mellor suggests in his map. There can be very little doubt that the aggregate effect of these faults is that the beds on their north-east side have been thrown back very considerably to the north. The disturbance is, in fact, so great that one cannot claim to be able to connect the quartzites at the Geldenhuis mill directly with any quartzites on Barrett's Rietfontein. All that one can say with certainty is that it is impossible to link the former quartzites with the quartzites at the base of the ridge on Barrett's Rietfontein. All the field evidence, apart altogether from the dissimilarity of the two sets of beds, is opposed to such a tracing, and it must be noted that Dr. Mellor himself makes no attempt to join them up.

The Government Reef is easily recognisable to the east of the broken zone, and it has there all the typical features of that reef. Here, again, it bears exactly the same relation to the "Coronation Series" as it does to the Hospital Hill Series at any point between the Geldenhuis mill and Maraisburg, while the "Coronation Series" in turn has the same relation to the quartzites at the base of the main ridge (the Orange Grove Quartzites, according to my reading), that the Hospital Hill Quartzites normally maintain to the Orange Grove Quartzites. And, though the various beds cannot actually be traced through the faulted zone, there is nothing whatever, so far as I can see, to suggest that their relationship is different on the two sides of that zone. I can see no sign that any of the beds in the Barrett's Rietfontein section are squeezed out in coming west, or that the series at the Geldenhuis mill opens out in an easterly direction so as to admit other beds into the succession.

Any one who makes a careful examination of the "Coronation Quartzites" on Barrett's Rietfontein, and of the reef at their base, and notes their relation to the underlying shales, must see that there is a striking likeness between them and the Hospital Hill Quartzites as seen on either side of the fault west of the Geldenhuis mill. I have given a great deal of evidence elsewhere to prove that Dr. Mellor's "Coronation Series" is none other than the Hospital Hill Series. That evidence was drawn almost entirely from the West Rand, and the independent evidence supplied by the area with which I am now dealing is not only a strong confirmation of it, but is in reality quite capable of standing by itself. It will be recognised that, if my theory of the identity of the "Coronation" and Hospital Hill Series were accepted, my correlation of the beds in the section on Barrett's Rietfontein would be complete from the base of the system up to the Government Reef. Dr. Mellor himself has pointed out the completeness of the succession from what he calls the Hospital Hill Quartzites on Barrett's Rietfontein up to the Government Reef, which compared with the corresponding section at Witpoortje; and I, of course, maintain that the quartzites at the base of the succession are the Orange Grove Quartzites in each case.

Neglecting for the moment all the other evidence which I have put forward, is it not strange that, when the Hospital Hill Quartzites are traced away both west and east from the central area, they should link up with the "Coronation Quartzites"? I have followed this horizon again and again from Auckland Park to Witpoortje, and I can come to no other conclusion than that the coupling with the "Coronation Quartzites" is sound in that instance. Even supposing that this seeming double connection might be due to mere coincidence, does not the coincidence become positively staggering when the connected sets of beds show such remarkable resemblances to each other, not only in individual features, but in their succession? The similarity between the Hospital Hill and Coronation Series is curiously suggested by Dr. Mellor's own descriptions of the two series, and I am prepared to prove that the similarity is in certain particulars much greater than his descriptions indicate. For instance, no description of the "Coronation Shale" in the West Rand is complete which does not mention its contortion. It is true that the contortion is comparatively rare in this area, but yet characteristic instances of it can be shown at various points between Maraisburg and Witpoortje. Again, I contend that the "Coronation Quartzite" has all the typical features of the Green Quartzites—thickness, colour, texture and general appearance—and I once more challenge Dr. Mellor to compare the succession from the "Coronation Shale" up to the Government Reef at Witpoortje with the sequence from the Contorted Bed to the same reef at the Scottish Monument. He will, no doubt, object that the latter section is very incomplete, many thousands of feet in thickness having been eliminated from it; but here, again, the *onus* is on him. In this instance, too, there is a singular lack of evidence of any unusual disturbance.

Working downwards from the "Coronation Shale," we have a certain bed (or beds) in the same relation to that shale which the Speckled Bed has to the Contorted Bed, and which even Dr. Mellor admits to have a superficial resemblance to the Speckled Bed. I hope to show later that the resemblance is much more than superficial. As to the further downward succession at Witpoortje, there is no need to add to or amend the description already given in "Faults and Dykes," except to say that the Ripple-marked Quartzites—which I admitted to be a much thicker bed than usual in its occurrence at the southern end of the Witpoortje Gorge—appears to resume its normal proportions further west, while still retaining the triple form to which I called special attention in comparing the two occurrences in the Gorge.

Referring to what Dr. Mellor calls the lowest bed of the Hospital Hill Quartzites in that Gorge, I again ask Dr. Mellor, as I did in the case of the corresponding bed on Barrett's Rietfontein, to apply to it his own description of those quartzites, and to note particularly the blue colour which the quartzites in the gorge exhibit. In discussing this bed in "Faults and Dykes," I described a distinct reef which occurs in the gorge at some distance above their base, but I forgot to mention that a very similar reef is to be found in a corresponding position in the Orange Grove Quartzites near Orange Grove. The occurrence is decidedly local in each case, but the resemblance is striking enough to be worthy of some attention.

The principal change made by Dr. Mellor's composite section of the Lower Witwatersrand System is that he introduces two new series, above the Hospital Hill Quartzites, into the accepted succession of the central area, and that he places three beds of quartzite in the Hospital Hill Quartzites instead of the one which is generally recognised in the neighbourhood of Johannesburg. He also gives distinct recognition to the Government Series in the central area, and his suggestion will in this instance probably be generally accepted; but this amendment is one of subdivision and not of addition. He makes the total width of the normal section in the Central Rand about 15,300 feet. The Coronation and Promise Series, together with the assumed upper beds of the Hospital Hill Quartzites, make up some 5,200 feet, and these should, I contend, be removed from the section. Further, if my reasoning is sound, the true width from the Government Reef up to the Main Reef Series is obscured in a great part of the Central Rand by the presence of the North Rand Fault. It is safer, therefore, to take the width of this part of the system from the Witpoortje section. This, taking Dr. Mellor's measurements, entails a further reduction of about 2,300 feet in his composite section. The amounts to be subtracted thus come to about 7,500 feet, leaving a true thickness of 7,800 feet—a very important difference. Now, I have endeavoured to prove that the portion of the Witpoortje section from the base of what Dr. Mellor identifies as the Hospital Hill Quartzites up to the Main Reef Series, embraces in reality the whole of the Lower Witwatersrand System, and he makes the width of this portion also about 7,800 feet. I do not know where Dr. Mellor took his measurements for the composite section of the central area, but, if they were not taken at or near Witpoortje, this exact agreement between the amended widths in the central and western sections is a somewhat remarkable coincidence, and seems in itself to suggest the reasonableness of my amendments.

As to Dr. Mellor's assumption that there are normally three beds of quartzite in the Hospital Hill Quartzites, it seems most probable that this idea was inspired by his adoption of the orthodox belief that the quartzites at the base of the ridge at Barrett's Rietfontein and the corresponding quartzites south of the homestead in the Witpoortje Gorge belong to the Hospital Hill Series. Throughout the greater part of the area dealt with in his map, he shows only one bed of quartzite in this series, and if, in the two instances mentioned above, the beds identified by Dr. Mellor as the Hospital Hill Quartzites are in reality the Orange Grove Quartzites, the only remaining place at which the three beds are said to exist is at Brixton. There seems to be nothing to distinguish the upper quartzites here from the quartzite beds which usually intervene between the Green Quartzites and the Government Reef; and in any case the mere identification of such ordinary-looking quartzites as these is a very slender support for the bold assertion that, wherever they cannot be recognised as the upper beds of the Hospital Hill Series, those beds have been squeezed out.

This further deficiency in Dr. Mellor's solution must be kept in mind—that he seems to have left no room for any explanation of the Witpoortje Break other than transverse faulting. I think most people who know the Witpoortje district well will agree that such explanation is entirely inadmissible.

In conclusion, I have no hesitation in saying that I should find it impossible to accept Dr. Mellor's reading—involving as it does such peculiar and inconsistent faulting, and the inconsequent and miraculous elimination by squeezing of huge masses of the formation—even though there were no alternative solution of the problems of Rand geology. But I have put forward a theory which at least claims to give a complete, simple and perfectly consistent solution of all those problems. In order to afford an opportunity to those who wish to test my reasoning fairly, I will now divide my case into eight sections, and invite my critics to attack them in detail.

These sections are: (1) The local evidence at Rietfontein that the reefs there are a detached portion of the Main Reef Series; (2) the geology of the area east of the fault just west of the Geldenhuis mill, including the section on Barrett's Rietfontein; (3) the tracing of the Hospital Hill Shales and Quartzites from Johannesburg to a point south of Witpoortje; (4) the presence of the whole of the accepted succession of the Lower Witwatersrand System between the base of the Main Reef Series in the Grey's Mynpacht and the Orange Grove Quartzites south of the homestead in the Witpoortje Gorge; (5) the course and effect of the Orange Grove Fault from the Witpoortje Gorge nearly to the eastern boundary of the farm Waterval 79; (6) the tracing of the North Rand Faults from the old Saxon mine to Rietfontein; (7) the duplication on the Witpoortje Fault from Witpoortje to Florida; and (8) the similarity of the beds at Witpoortje and the Scottish Monument, from the "Coronation Shale" up to the Government Reef in the former area and from the Contorted Bed in the same reef in the latter. (By the way, unless I have misunderstood Dr. Mellor, I think he places the Government Reef at the Monument rather too far to the north. The reef which he identifies as the Government Reef is apparently the one which I distinguished as the "Monument Reef." There is a perfectly typical development of the former reef further to the south.)

I believe each of these sections to be thoroughly capable of standing by itself; and I hold that, so long as any one of them remains unrefuted, it blocks the way both for Dr. Mellor and for the adherents of the orthodox school—with the exception that the former seems to have retained the option of accepting the first section, and that the seventh may not be incompatible with the faith of the latter. And though I am ready to let each of these sections stand alone, it must, I think, be recognised that the eight sets of evidence really support each other in a wonderful way. Indeed, they are so closely knit together that, if all the correspondences in them are to be accounted for by mere chance, it will surely be necessary to revise all one's ideas of the value of evidence.

JOHN S. OLVER.

June 19th, 1912.

There has just arrived in Pretoria a gentleman well-known in the mining and geological world, in the person of Mr. O. Labahn, mineralogist and prospector, who has spent no less than four years on the South-West and West Coast of Africa, and comes to Pretoria with a large and interesting collection of minerals, says the *Pretoria News*. In these the characteristics of certain of the rock formation of portions of Little and Great Namaqualand are plainly discernible. Columbite (tantalum), copper glance, seem to be present in large quantities in the country famous for its alluvial diamond deposits, to mention only a few of the most interesting specimens in his possession. Molybdenite is present in large quantities, and Mr. Labahn is enthusiastic concerning that portion of the Union as yet so little explored. Several fine stones have been found in the locality referred to, and on this subject Mr. Labahn has much to say. He speaks in glowing terms of the country and its climate, its remarkable volcanic formation, and mountain scenery beneath which much that will be useful to man is still hidden. Though the richness of copper glance belts should amply repay working, Mr. Labahn believes that some day a second Kimberley may arise in that corner of Hottentot Land. With the view of further exploring the country, Mr. Labahn now intends to fit out an expedition in Pretoria, which will travel overland, expecting to reach his former haunts in about six weeks from the time of starting. Threo local gentlemen intend to accompany him, and it is possible that a start will be made about the end of the current month.

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THE MINERALS OF THE MURCHISON RANGE AND DISTRICT.—IV.

Account of the Haenertsburg and Woodbush Goldfields—Gold-bearing Deposits of the Black Reef Series—An Important Government Report on the Results.

THE general characters, composition, and mode of occurrence of the pegmatites strongly indicate that they are essentially igneous rocks, and, using the term in a broader sense so as to include other varieties besides those exhibiting a graphic intergrowth due to simultaneous crystallisation of quartz and felspar, two kinds may be distinguished. Firstly, there are extensive masses of white hungry quartz, sometimes many yards in width and giving rise to conspicuous outcrops, often found on the tops of flat ridges or kopjes and frequently persisting for considerable distances along the strike. A good example occurs between the Selati River and Longwan's Kraal, where the rock has been exposed in several prospecting pits. It consists of very pure dead white glassy quartz, very like that of the Palmietfontein Mine, near Pietersburg, or of Witkop at Mount Maré; the outcrop has been followed for about half a mile. Very occasionally there is a little turbid white felspar. Molybdenite occurs in numerous scattered flakes or leafy bunches up to the size of a two-shilling piece, composed of fresh and very lustrous soft plates with regular hexagonal outlines. Surfaces long exposed to weathering exhibit irregular cavities due to removal of molybdenite. It is not certain to which parent magma such occurrences must be assigned, but collectively they seem to belong rather to the Older than the Palabora Granite, and markedly differ from the very coarse highly felspathic younger pegmatites which carry the commercial mica in larger quantities on the south side of the Mashishimala Hills. A typical pegmatite, undoubtedly derived from the magma of the Older Granite, and also carrying muscovite, was alluded to in a previous chapter. It is markedly sheared, and this feature may possess a diagnostic value in attempting to distinguish the older from the younger series of pegmatites. The first group, then, is characterised by a markedly predominant quartzose nature, frequently free from felspar, and thus distinct from the highly felspathic muscovite-bearing second group.

The second group of pegmatites, as representing the source of the commercial mica, is of special interest. The deposits occur abundantly in many occurrences on Islington No. 2017, Inyoka No. 1637, and Excellence No. 309 and elsewhere further east, but are practically wanting inside the Mashishimala granite. The argument of the preceding pages and the discussions show that these pegmatites belong to the younger or Palabora Complex, and this is not merely of academic interest, because it obviously narrows down the possible areas over which deposits of commercial mica may be expected. The great abundance of the pegmatites is often most striking, and, e.g., round Inyoka Kop or in the neighbourhood of Marble Baths, many outcrops are sometimes crowded together over a small area. The veins form elongated masses, in places as much as several hundred yards in length and forty or more feet across, rudely lenticular in shape, and arranged with their long axes parallel to one another, thus exhibiting a common orientation which at the boundary between Inyoka No. 1637 and Excellence No. 309 bears 10 deg. south of magnetic east. Examined in detail, individual pegmatites show much variation in their mode of distribution, etc.; some dwindle down to mere veins, swell out irregularly within a few yards, bifurcate, and penetrate the older gneissic granite and schists in more complex manner. At one locality the pegmatite breaks right across the planes of schistosity of the earlier formations, at another its material is intruded along these planes in very regular manner, producing more evenly banded injected schists. The common mica-bearing pegmatite is a brilliant white rock composed of a very coarse association of felspar and quartz. The latter forms transparent to translucent glassy and very fresh irregular masses or smalled blebs distributed anyhow through the rock, and often intergrown with felspar. This mineral occurs in very coarsely crystalline opaque white masses of albites with good cleavage faces. Its determination depends upon the low mean refractive index, as seen in thin section, the positive character in sections cut at right angles to the acute bisectrix and on the following analysis of a very fresh occurrence at Lulham's Workings on the north side of the Olifants River:—

	Per cent.
SiO_2	66.60
Al_2O	21.32
Ca O	0.20
Mg O	0.50
Na_2O	11.18
K_2O, trace	
Ignition	0.50
	100.30

Analysis of Felspar from Pegmatite: Lulham's Workings, by C. C. Gardthausen.

This analysis agrees closely with those of typical occurrences of albite. It is interesting to note that in the parent rock of the pegmatite, both in the Palabora granite, but even more so in the syenite microcline is a constant constituent; the presence of albite in large quantities in the pegmatites points to a considerable enrichment in soda in the residual mother liquor. At Lulham's Workings the pegmatites are very well exposed in open-cast workings up to thirty feet in depth, where they show an intimate association with gneissic grey granite, the latter repeatedly enclosed in blocks several cubic feet in size and completely surrounded by pegmatite, which also sends long thin veins and apophyses into the schists and gneisses. The mica is muscovite, often silvery white when long exposed to weathering, but usually with pale smoky quartz colour when fresh. It occurs sometimes in thin disseminated platy crystals, but more usually in "books" up to two or three inches thick with outlines approaching hexagonal symmetry. It also forms large rosette-shaped masses up to eighteen inches in diameter. All the development so far consists of open-cast workings, and no underground mining has as yet been attempted. Though mica is very plentiful, a good deal of useless rock has to be turned over before muscovite of suitable size and free from flaws can be obtained in any quantity. Many of the books are commercially spoilt by vertical cracks and other discontinuities, which often cut right through. In other cases crystals show a wavy surface which renders them inferior or even useless. Trial shipments are stated to have come up to the standard required of good commercial muscovite, and to have been valued at £200 per ton, but it cannot be denied that larger quantities are sometimes only obtainable after the removal of much overburden and waste rock. After trimming the mica is cut up into rectangular or square plates, from two by three inches up to five by six inches. Some of those are beautifully transparent and free from defects; others show inclusions, either in small scattered opaque deep brownish-black spots, or arranged in isolated straight lines, or forming a system of linear inclusions cutting one another in more systematic manner. In some of the pegmatites the arrangement of the various minerals is more definite, which represents an outcrop at the western end in one of the workings at Lulham's Camp. In the inside is lenticular or oval mass of true pegmatite showing simultaneous crystallization of quartz and felspar; it is surrounded by an "eye" of pure quartz, enveloped by a well defined zone from two inches in width downwards, composed entirely of biotite, the whole enclosed by soft greenish chloritic schist. The geological conditions presented in the workings of the Mica Mines, Ltd. (formerly known as Bowles Camp), situated about one and a quarter miles from Lulham's Camp, present essentially the same characters. The rarer minerals, which are characteristic of granite—or syenite—pegmatites in certain European occurrences are conspicuous by their absence. In Lulham's Workings in pinkish-yellow mineral was found surrounded by a black reaction rim. In the pegmatites of Malolane abundant garnet, tourmaline, and green fluor apatite can be seen. The total absence of transport facilities in the past was one of the most serious drawbacks to the progress of the mica industry of the Low Country, but the construction of the Selati Railway through the heart of the Mica Fields has now removed this difficulty. The highly erratic and uncertain distribution of the pegmatites, their varying mica content, renders mining operations very difficult, while the continuity of the deposits in depth has yet to be established. While there is no doubt that muscovite of good commercial quality exists, no reliable estimate can be made as regards quantity. It is obvious that much rock has to be shifted before the mineral can be obtained in even modest quantities. Of late various uses have been found for mica waste, and no doubt advantage will be taken of this. It does not seem likely that the occurrences, as far as present indications go, can form the basis of extensive mining on a large scale, especially now that efficient transport facilities are close at hand. Mica also occurs under essentially similar conditions at Malelane, east of Palabora, where an old track leads from April Kop to the Malelane River. Numerous prospecting operations on both sides of the river have exposed several large masses of pegmatite, with characters very similar to those seen in the Mica Fields of the Olifants River. During 1911 several new roads have been cut into this and the Palabora district, which are of great assistance in the examination of this lonely bush country. For some distance east from April Kop typical island landscape predominates with characteristic semi-tropical Lower Bushveld vegetation. Isolated kopjes of ball-granite and syenite are conspicuous and due to the younger Palabora Complex; these continue about as far as the Putwana beacon, where stony ridges and swelling bults become established, showing typical older granitic and gneissic rocks with many minor zones of basic schists. Pegmatites are numerous and well exposed in several old workings along Malelane River. The mica is muscovite, distributed through and related to the other constituents of the pegmatites very much like it is further west. Very commonly the muscovite exhibits a faint greenish tinge. Quartz and felspar are abundant, but other minerals, apparently not common in the more westerly fields, become very conspicuous at Malelane. On the west bank of the Malelane River very coarse brilliant white pegmatite is well exposed in some prospecting pits and carries abundant large columnar crystals of green fluor apatite up to seven and a half inches long and two and a half inches thick, also in larger and more rounded crystalline masses. A little further downstream the intimate association of gneiss and pegmatite is repeatedly exposed; here one also finds vein-like aggregates of black tourmaline in dense masses or conspicuous needles up to one and a half inches in length traversing the felspathic pegmatite. At the same locality garnet is also represented in larger rounded dodecahedral crystals as much as one inch across, and enclosing green columnar apatite one-quarter of an inch thick. Besides coarse pegmatites, finer-grained aplitic intrusions are well exposed on the left bank of the Malelane River, about half a mile below the drift. These veins are intruded into highly foliated greyish hornblende gneiss, sometimes in perfect conformity with the old divisional planes, sometimes breaking across them in more complex veins and irregular masses varying from eighteen inches in width down to mere streaks. By the regular and repeated injection of gneiss very evenly banded rocks are thus produced. There is a typical instance of a white aplite vein, six inches thick and interbedded in gneiss; such apophyses consist mainly of a fine-grained association of quartz and felspar, while disseminated freely throughout the rock are many granular idiomorphic crystals of brown garnet. Collectively the mode of occurrence and general characters of the Malelane pegmatites are essentially the same as those of the better known Mica Fields further west, and the former seem likewise genetically connected with the younger Palabora Complex, rather than with the Older Granite; the fact may be recalled that the latter complex reaches eastwards at least as far as the Putwana beacon. What has been said above regarding the economic possibilities of the mica deposits south-east of Leydsdorp applies with greater force to the Malelane occurrences, as even with the opening of the Selati Railway they are still some forty-five miles from the line, while the climate is bad except during the winter months.

(To be continued.)

UNION GOVERNMENT AND THE "SMALL MAN."

Question of Financial Aid—Niggardly Help Vouchsafed—Secretary for Mines Defends Policy—Drilling and Prospecting—Roads and Geological Maps.

The following is taken from the instructive evidence given by Mr. H. Warington Smyth, before the Select Committee on Public Accounts at Capetown recently :—

Mr. Jagger : What is the reason for the difference between the grant and the actual expenditure under the head "Drilling and Prospecting (Natal Province)."?—The estimates for this work are made on the basis of the drills being in use for the whole of the twelve months, and if we do not get applications from people who wish to have drilling done for them we do not keep on all the boys, and, therefore, as long as the drills are not working, we are saving on wages, but the moment they get into work we take the boys on, and then our expenditure begins.

Chairman : When are you going to stop this business?—You will remember that the Minister and yourself discussed this question when we framed the estimates, but there was such a strong feeling in Natal that this was of great assistance in developing the north-west portion of that Province that it was decided to continue it, especially as we get back a considerable portion of what we spend.

Is Natal the only Province?—Yes.

Why is it confined to one Province?—As far as the Transvaal is concerned the position is this : you have a large number of drilling contractors who are always willing to take on work of this nature, but in Natal it was carried out by the Government in the past owing to the fact that they could not get private contractors to do it except at exorbitant rates, and, in order to assist the people, the Natal Government bought the plant and instituted the system.

Mr. Jagger : If these contractors will go down as far as Piet Retief and Ermelo surely they will go across the border?—In just the same way they will not go down to Piet Retief, but they will go to places like Ermelo without any difficulty.

Why cannot they go down here?—That was the experience of the Natal Government in the past. Last year it was suggested dropping it, but then the question arose as to the selling of the plant, and we found we should get very little for it.

What is its value?—I cannot tell you exactly, but there are about six drills, and with all the material I should think they must have cost the Government £2,000 to £3,000.

Mr. Orr : What revenue do you get in Natal?—During 1911-12 we received about £1,200.

And you spend almost £2,000?—Yes. I cannot tell you the revenue we received for the year 1910-11.

There is a loss on the business?—A slight loss.

Mr. Robinson : Is there a great demand for the use of these drills?—At the beginning of the year there was very little demand, but at the moment I understand all the drills are in use.

In what districts do these drills operate?—All round the north-west—in the coal districts largely.

How do they make application?—They send in an application for a drill to the Inspector of Mines, stating the period for which they want the drill, pay the transport for the drill, and then we send the necessary labour down, and the expenses are supposed to be paid by the hirer.

Chairman : You do not do it with the other Provinces?—No, but in all the other Provinces we are using the Vote shown on page 161 of the Estimates, "Assistance for District Mining Development."

Mr. Jagger : In what way do you assist mining development in the other Provinces?—The question of assistance for mining development is one that has been discussed in the Transvaal for many years. When the matter came before the Transvaal Government the question that naturally arose was : Why was it necessary, to what extent was assistance to be given, and in what way was it to be given—?

Sir Edgar Walton : What charges do you make in Natal?—I should like to get my files on this subject, but I know we are continuing the charges of the late Natal Government, and all the files are being dealt with by the Inspector in Natal, in order to save circumlocution.

Would you consider an application received from any other Province?—We have had several applications from persons in the Cape, and we have told them that if they are prepared to pay the cost of transport of the drill we are prepared to carry out the work on the same terms as soon as a drill is available.

Mr. Jagger : We have a Vote down in the Estimates of £15,000 for construction and repair of drifts and roads, and then you have another Vote "General Assistance, Purchase and hire of plant, etc., £5,000. What does that mean?—We have a system in force under which applications can be received from struggling concerns for assistance in connection with putting up, say, a rope tramway or assistance of that sort, and upon that we advance loans to be repaid by degrees. Another example would be that of a man who had a small proposition, and who could not afford to buy a battery of, say, three or four stamps to work it—we could advance to him for that purpose, the money being gradually repaid, although we have had very few cases under that head. As regards the provision for construction and repair of drifts and roads, as I was saying, it arose in this way. There was a great outcry in the Transvaal that the Government should assist the industry, as has been done in the case of Australia, where the Government have gone in for central batteries, and also central smelting works, such as in the Waterberg where they were finishing tin, and where it would be of very great assistance, and could be done cheaply by the Government. We went into the matter and found that in no part of the Transvaal were there conditions which would justify the erection of the necessary plant for such a scheme or for central batteries, because if you are going to erect a central battery it is necessary that a large number of people should be conveniently placed for using it, and the development of the various properties must be such as to promise a regular output. The conditions in the Transvaal and the degree of development pointed to the fact that such a condition of things would not obtain for some time to come. The people said : "In that case the position is that we must erect our own machinery, but owing to the state of the tracks we are unable to get out machinery to our mines, will you assist us to improve these tracks and roads?" We looked into that, and came to the conclusion that the cheapest and most effective way of assisting mining development in the outside districts was to make tracks and roads, because, even if afterwards the mine shuts down, you have still the satisfaction of knowing that you have done something for the improvement of the district generally, and the money is not sunk and lost in the concern.

Do you not find as a rule when you go in for these things you lose money?—I think that is probable, and I think that will happen in most cases of loans on machinery or plant.

Do you not think there is sufficient private enterprise to do this work?—Personally, I should have thought so, but I know that if we cut this drilling out we shall be inundated with petitions and complaints from Natal.

In the Cape we have had nothing of this sort—the people have had to help themselves.—We do a good deal in the Cape Province, too. For instance, only recently in the case of the River Diggings at Barkly West we have advanced £300 to improve certain roads to enable the people to get their machinery down there and to improve the communication. And we are helping elsewhere.

I would like to see this £5,000 go altogether.—I should not like to cut that out for a moment. We only put it in the vote in this way because we have had applications for that class of work, otherwise, we should have merely asked for £20,000 for assistance for mining development. We stated it in that way in the Estimates in order to make it clear what the objects were.

Why not leave these things to private enterprise as far as regards the purchase and hire of plant?—The complaint we have constantly made to us is this; we have prospectors coming to us who have made a certain amount of money as miners, and who want to get and work a small property of their own. In the course of prospecting, say, at Barberton, they have found a small property on which they want to put up stamps. Then they come to us and ask for assistance. We say to them : "If you want money why not go to Johannesburg," and they reply : "If we go to Johannesburg we shall only get the money by parting with eight-tenths of our property, and, therefore, to enable us to get our battery we want your assistance." We want to encourage the small man propositions, and get the same results as Rhodesia. It is an important aim.

Sir Edgar Walton : What has been the result?—The result is shown in the case of the Barberton and Sabie districts; four years ago there were only about six 3 stamp batteries, and to-day there are 16 or 18.

Worked by small syndicates?—Yes, by two or three men syndicates.

Mr. Jagger: Have you lost any money in these cases?—There is a case mentioned by the Auditor-General on page 216—the case of Mr. Knipe—but the use of this vote elsewhere has been successful, and very much appreciated by the small workers.

Sir Edgar Walton: Do you satisfy yourself that it is a payable proposition, and that you are not joining in speculation?—In the case of any purchase of plant, yes. As regards the small propositions, to-day the Sabie districts are turning out quite double what they did four years ago.

Chairman: A very tight hand is kept on this expenditure?—Yes.

Mr. Robinson: Will you give us details as to the amount received from the hirers of these drills in Natal, and how it compares with the expenditure?—Yes.

Mr. Orr: And also similar information with regard to the Cape Province shown on page 211?—That was in connection with applications made by prospectors to go on these islands up the coast prior to Union. The Cape Government decided that they did not want prospectors on any of these islands, and rather than let them go on they started prospecting themselves. All this has now stopped.

But there is an item shown under Cape Province of assistance for district mining development. Will you let us have information as to that?—Yes.

Sir Edgar Walton: You say you make loans to these people, is there any statement shown here?—No.

Mr. Orr: There should be an account of advances with his report, Mr. Gurney?—*Mr. Gurney*: Yes. *Mr. Smyth*: There were none last year.

On page 213 there is a statement of balances outstanding at the 31st March, 1911, South African Collieries, £736. What is that?—I have not the details of it here.

Mr. Jagger: What is this surface guarantee account shown?—*Mr. Smyth*: When prospecting contracts are entered into in the Free State for prospecting on Government land they have to make a deposit against any damage which may be done to the surface, and we use that money for filling up the trenches and excavations of a dangerous nature which they have made, if they do not do it themselves. If they do it then we return the money.

Mr. Jagger: What is the point about the Kaap Valley?—It is as stated in the paragraph quoted by the Auditor-General. If he had been successful in his experiment it would have been a very valuable discovery. Frequent efforts had been made unsuccessfully to deal with the sands in the Kaap Valley. The difficulty is in the separation of the gold. There is a very heavy iron in the sand, and the difficulty is to separate the gold from it. It is all alluvial, and, the specific gravity of this black sand is so great that it is impossible to separate the gold from it.

What is the position with reference to the Geological Commission of the Cape—you have got rid of it?—The Commission still exists, but the expenditure is taken on our vote for the Geological Survey of the Union. The Commission has been kept on as an advisory body. The two geologists, who were really servants of the Commission, are not on the establishment of the Service at the present moment, but, of course, by their experience and by their scientific abilities both are as good as anyone we have. The Reorganisation Commission went into the status of this portion of the survey, and they advised that the whole survey of the Union should be under one direction, and General Smuts agreed to that, and was going to abolish the Commission, but eventually, as I say, it was kept on as an advisory body.

You gave them notice?—We have given them notice that the Government proposes to place these two men on the establishment, and that in those circumstances it would not appear to be necessary to ask the Commission to continue their services. The continuance of the Commission complicates things in a certain way, because I cannot send an instruction to the officers I have mentioned direct, but it must go in writing direct to the Commission, and then the Commission may not take the same views as to what is proposed to be done. This may result in considerable delay. There is, however, no real objection to the Commission. The only thing is that the Treasury say we are the department responsible for the expenditure, and we must, therefore, carry out the Treasury regulations relating to payments.

Do you not place a certain amount at their disposal and leave them to spend it?—We are held responsible for the expenditure.

What was the practice at the Cape, Mr. Gurney?—*Mr. Gurney*: They had a grant made to them and kept their own accounts. *Mr. Smyth*: It is very desirable, under Union, that all our geological maps should be issued under one system, in one set of reports, and by one authority. For instance, although in Australia they had four geological services, the first thing they are doing is to re-organise those services with a view to having uniformity with regard to the nomenclature, geological colouring and scale of the maps. That is very desirable, especially from a scientific standpoint, and also for persons inquiring from outside the Union as to geological data, and if there are different systems and scales it is very confusing. As a matter of fact both the Director here and in the Transvaal have come together, and they work together very well in geological matters, but the fact remains that you have your maps published on a different scale and in a different manner.

Is it not far better to have local assistance?—The Commissioners are of no assistance to-day. They did great service in the past. There is only one geologist on the Commission.

Are not their records very valuable?—Yes, but they are the records of the geologists, not of the Commission.

Is it essential to publish all these costly maps?—I know the work being done to-day by the Geological Survey is in the opinion of all scientists first class.

But is it essential to issue all these costly maps to people who do not really require them?—As far as the public are concerned these maps are very largely used. Our maps, for instance, of the Pilgrim's Rest district were largely bought by mining people, and some are out of print now, and they were only published eighteen months ago.

What do you charge to the public?—A nominal sum only, something like 7s. 6d. per map. It does not pay.

Who issues these reports, the Stationery Department?—Yes. The geologist does all the technical work and the maps and sections, and then it goes to the Printer and is printed, and he fixes the price.

How does he fix the price?—I do not know. Some years ago there was a discussion as to whether they should be charged the full cost of the production, which would work out at a high figure, say, 15s., and the Government decided to put them within reach of the public who would essentially require to use them. As to the question of the information being retained, but that we should not publish the maps, I would like to say that for all purposes a Geological Survey is of no use without maps. It would be really wasting material to continue a survey under such circumstances.

Colonial Secretary Visits G.S.W. African Diamond Fields.

The correspondent of Reuter's Agency at Luderitzbucht, writing on June 22nd, says: Dr. Solf, Secretary of State for the Colonies, has arrived. At a public reception, the Burgmeister (Herr Kreplin) gave a general resume of the last four years, tracing the history of the diamond industry. After their highest state of prosperity, he said they had come to the present low state of depression, which was helped by the discovery of the northern fields, where hundreds of thousands of marks had been expended on expeditions in surveying and prospecting, and nothing had resulted. In the south they also had been faced by further difficulties on account of the lack of knowledge, high taxes, and expenses, which exceeded the returns. The result was seen to-day in liquidations and insolvencies. Those who withdrew their capital in time were now looked at jealously, but those who remained would see a steady and sound, if slow, recovery. Every one was hoping that the Landesrat, instead of only being able to make proposals to the Reichstag, would soon be able to vote themselves money for their own concerns. He hoped that where possible their wants would be met. Dr. Solf, replying, declared that they should not be pessimistic, seeing how Luderitzbucht had advanced, and considering it had only been a municipality 2½ years. He hoped to have an opportunity of meeting the Chamber of Mines within the next few days, and he felt convinced that they then would be able to look more happily into the future.

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Rhodesian Section.

PROGRESS IN THE BEMBESI MINING DISTRICT.—II.

Position at the Romola Nigel, Queen's, Eastern Queen's and Various Small Ventures.

[By a Special Correspondent.]

The Romola Nigel G.M. Co.

About two years ago this company obtained interests in Rhodesia, their chief holdings being in the Bembesi. They hold altogether about 360 claims within a radius of, roughly, two miles. The mainstays of the concern are the Polar Star and Eastern Queen's Groups. On the former active development is being done upon the Claydon Reef, which so far has been developing in a highly satisfactory manner. Prior to the acquisition of the Claydon by the company, the claims passed through several hands, but beyond the milling of some good rubble, nothing was actually done with the property. Last year further beds of high-grade rubble were disclosed, and a serious attempt was made at locating the reef, which was shortly afterwards exposed in trenches. The first indication was a rich quartz leader, but no idea of the size of the gold-carrying body was then formed. Finally it was discovered that the auriferous formation consisted in a porphyrite body traversed by quartz leads, and a lode some 30 ft. in width was exposed. A two-way vertical shaft has now reached the second level, which is partially developed, and the development rock is being crushed in a 5-stamp battery on the adjoining Polar Star claims. The exact extent of the lode has not yet been determined, but the formation has been picked up at various points on the surface for a distance of some 3,000 feet. The mine is, therefore, in an exceedingly interesting position, with tremendous possibilities apart from the large tonnage of ore now in sight.

The Eastern Queen's.

This is a quartz proposition situated about one and a half miles from the Queen's Main Reef, and was formerly on tribute to Mr. J. P. MacCay, who milled 12,000 tons of rubble from it for a return of practically 20s. per ton. The ancients worked a strike of 1,000 feet upon the property, and took out huge quantities of ore. The company has proved a strike of 2,000 feet with high values, and has secured extensions with the same reef traversing the lot, over a strike of 8,000 feet. Development is being confined to the section around which the ancients worked, altogether about 2,000 feet in extent. The first level has been practically fully developed, and the drives on the second level have now been pushed on for a considerable distance in excellent values. The high cost of transport for the ore, consequent upon the closing of all roads to oxen, has hampered the recent operations upon this property, but this is only a very temporary set-back, and when it is again possible to get the rock quickly and cheaply to the battery more extensive exploration of reef will be resumed.

A certain amount of useful work has been put in upon the other holdings of the company, and good values have been almost invariably the result. It may be mentioned that all the development has paid for itself, and that the company is straining every nerve to increase its ore reserves to such a point as to enable working on a large scale for profit to be commenced in the near future. The policy is a thoroughly sound one, and now that the major difficulties have been surmounted success seems to be practically assured. The management of the property is in the hands of Mr. James Mitchell, M.I.M.E., whose experience is world-wide.

Small Ventures.

A good deal of prospecting has been done on the ironstone belt which runs for some twenty miles on the north side of the river. So far no discoveries of great importance have been made, though one at least on the further, or north side of the range, promises well. This has been named The Tower Hill, and is owned by a small local syndicate. One shaft has been sunk to a depth of 100 feet in good values, and at this depth a level is now being driven. Granted favourable values, a mill will shortly be erected and reduction work started. A trial crushing made some time ago gave a return of about 10 dwts. per ton. The Inkosi, owned by Mr. M. Kerr, is also developing, but water is at present seriously hampering operations. Some very fine specimens were taken from this reef, and good values encountered in the winzes over a good strike. The owner has several other interests, and is now sinking on the Umfulen, where big ancient workings have been located. A vertical shaft is being sunk to cut the reef at about 60 feet.

The Queen's.

This is the oldest of the Bembesi producers, and the first of the big tributing propositions which did so much to revive faith in the Rhodesian gold industry some years ago. The mine has had a productive life of seven years, three under the tributors, two and a half for Willoughby's Consolidated, and eighteen months or so under the Matabele Queen's Gold Mining Co., Ltd., under which title the mine was floated by the parent company. The existing plant consists of a 10-stamp battery, two grinding pans, sands and slimes plant, together with the necessary power plant. The steady nature of the outputs maintained by the property have always occasioned some surprise that the owners have not before now increased the crushing power of the plant, especially in view of the long strike of good rock which has been proved. Last year a compressor plant was installed, and development was pushed ahead rapidly for some months, big bodies of ore being developed. A new main shaft has also been sunk on the southern end of the property, and the development of the mine down to 600 feet will be shortly completed. The main shaft is to be continued to the 1,000 feet level with all speed, and development with machines recommenced at as early a date as possible. A comprehensive scheme for considerable additions to the reduction plant is also receiving serious consideration by the mine authorities, and when the whole programme has been carried out the mine will possess one of the most complete and up-to-date plants in the country. The crushing capacity will be raised to some 3,000 tons monthly, and I believe that the laying down of an electric power plant is also part of the programme. As a consequence, costs are expected to go down very considerably, and increased profits should enable the company to pay handsome dividends.

Cape Tin.

From Capetown it is officially reported that mining is dull. Development work is still proceeding at the local tin mine, but the company is in course of reorganization, and there is little prospect of employment for additional hands.

LATEST RHODESIAN MINING NEWS.

Rhodesian Diamonds—May Output Highest for the Year—New Issues and Discoveries—The Reconstituted Labour Bureau.

A "Rhodesian Prospector" writes to the *Rhodesia Herald* from Lomagundi, stating that had the De Beers—B.S.A. Co. appeal gone in favour of Rhodesia, "at least four diamond mines would now have been in course of development, providing always that the diamond law was satisfactory." He, further, describes as insignificant the reward offered for the discovery of a diamond pipe, which, he contends, will never induce a prospector to declare his discovery.

* * * *

The Goldfields Rhodesian Development Co. have taken a two years' working option on the Venice claims near the Umsweswe, and a thorough exploration of the property has been commenced. The Venice, which belongs to Messrs. Heilman and Kreft, adjoins the Moliere claims over which the Goldfields have also an option. It was a producing mine some time ago, when the ore put through the mill consisted chiefly of rubble.

* * * *

The following table shows the progress of Rhodesian gold production:—

Month.	1910.	1911.	1912.
January	£227,508	£207,904	£214,918
February	203,888	203,055	209,743
March	228,385	231,947	215,102
April	228,213	221,296	221,476
May	224,888	211,413	234,407
June	214,709	215,316	
July	195,233	237,517	
August	191,423	243,712	
September	178,950	225,777	
October	234,229	218,862	
November	240,573	214,010	
December	199,500	217,026	
Total Gold ...	£2,568,198	£2,647,895	£1,095,646
Other Minerals	222,930	242,864	90,935
Total value ...	£2,791,128	£2,890,759	£1,186,581

* * * *

A rumour from London is to the effect that it is the intention of the Consolidated Goldfields of South Africa, who are now controlling developments at the Falcon Mine, to provide funds for the equipment of that property through an issue of first mortgage debentures to an amount approximately of £200,000.

* * * *

Of the recent gold discovery in the Enterprise district no further news is forthcoming. That the surface indications are exceptionally favourable has been confirmed by several persons, says the *Rhodesian Mining Review*; but beyond this expression of opinion, visitors to the claims decline to go. The discovery, however, has attracted considerable attention, and many blocks of claims have been speculatively pegged in the district. But this is not the only great discovery that has been made; an even greater one has been announced in the Enkeldoorn district, which has caused considerable excitement in the locality.

* * * *

The improvement in Lonely shares which has taken place recently is to some extent accounted for by the splendid development results which the local office were able to cable Home last week. The cable stated: No. 8 level continues to open up splendidly. North drive, 85 to 105 ft., average width of reef is 42 ins., assaying 3 ozs. 14 dwts.; at 105 ft. the reef is 47 ins. wide, and assays 4 ozs. 10 grains. South drive, 65 to 85 ft., reef averages 5 ft. 6 ins. wide, averaging 2 ozs. 2 dwts.; at 85 ft. the reef is 7 ft. 2 ins. wide, and assays 1 oz. 15 dwts., and is not all exposed. No. 7 level: South drive, reef is improving in face; at 705 ft. reef is 18 ins. wide, and assays 22½ dwts. per ton. Consider this very important development, being the furthest point in the mine, south of the shaft, at which pay ore has been found.

* * * *

The accounts of the Rhodesia-Katanga Junction Railway and Mineral Company, Limited, for the 15 months ended September 30th last show a debit balance of £46,806 to be carried forward, after deducting £17,897 profit on the railway from December 9th, 1910.

* * * *

According to the *Financial Times* the Directors of the Cam and Motor Mines have now placed orders for the full plant, with a capacity of 15,000 tons monthly, the tests with the small experimental installation having been satisfactorily completed.

* * * *

Applications have been made to the Rhodesian Patents Office for Letters Patent in respect of the following inventions:—"Process of separating precious metals from their ores," in the name of Sidney Williams; "Process of and apparatus for precipitating materials from solutions," in the name of Daniel Bosqui; "Improvements in a process of extracting copper from a sulphate solution," in the name of Noak Victor Hybinette.

Rhodesian Native Labour Bureau.

At the first ordinary general meeting of the new Rhodesian Native Labour Bureau, held last week, Mr. Kempster, the managing director, in the course of a speech, said that the debts of the old Bureau amounted to £79,155, and the capital of the new Bureau in cash fell short of this by £2,483. They had 85 mining and general members, representing 11,845 shares, and 376 farmers, representing 1,529 shares. The reorganisation work had, amongst other things, effected a saving of £3,907 yearly in salaries. Dealing with the closing of Nyasaland for recruiting, he said it would seem that organised recruiting under restrictions as regards the payment of hut tax and provision for families was less subversive of domestic and tribal ties than an indiscriminate and surreptitious exodus of natives, who refuse work in Blantyre under inferior conditions at less than the market value of their labour. He went on to say that to May 31st alien labour into Mashonaland numbered 120,811 boys, and all, except 2,800, came to seek work independently of the Bureau. Owing to the disallowance of the Labour Tax Ordinance, the Bureau would now have to set aside £3,000 yearly for the redemption of the debenture issue, instead of starting five years hence with a yearly payment of £1,500, as the debentures were raised on the supposition that the Labour Ordinance would remain as a law. Their income, he stated, from January to May 31st was about £35,704, and their expenditure about £33,859. No provision had yet been made for depreciation or bad debts. He mentioned that 51 per cent. of the labour went to the mines, and 39 per cent. to the farms. He concluded by expressing the hope that the mines would make every effort to find employment for the boys now coming forward.

Sheba and Fairview.

A survey is being made with the object of running a 3ft. 6in. gauge line to the Sheba mine. It is also the intention to improve the road to Fairview, and a P.W.D. surveyor is at present on the spot for that purpose.

RHODESIAN MINERAL OUTPUT FOR MAY.

Increased Gold Return—Full Details.

We have received from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of May, 1912, with comparisons and values:—

GOLD.

Note.—All the declarations are in fine gold.

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield Ozs.	Value £
Bulawayo—				
Agincourt (Est. S. Roodt., deceased) ..	5	423	338·07	1420
Alice. Atlas & Andersons (R. Barkley)..	10	1595	294·74	1238
Aln (W. H. Robinson)	2	102	43·85	184
Antenior (W. J. Lane)	2	250	66·14	278
Do. (tailings)	—	190	21·68	91
Bengali (Hicks & Arbery)	5	315	105·86	445
Do. (tailings)	—	200	21·50	90
Berwick (Rhodesia, Ltd.)..	6	482	745·72	3132
Do. (tailings)	—	162	63·73	268
Do. (slimes)	—	452	188·13	790
Big Ben (W. E. Hunt)	4	186	176·33	741
Blanket (Forbes Rhod. Syndicate).. ..	15	401	50·58	212
Bucks Reef G.M., Ltd.	5	720	511·57	2149
Do. (tailings)	—	530	96·18	404
Burton (W. Holmes)	5	500	81·23	341
Bushtick Mines, Ltd. (tailings)	—	1576	391·09	1643.
Do. (slimes)	—	1599	149·69	629
"C" (C. & D. Synd.)	10	2523	201·05	844
Do. (tailings)	—	1921	214·30	900
Do. (slimes)	—	602	143·79	602
Cambrian (J. Fritz)	(5)	20	4·20	17
Claremont Mines (Rhod.), Ltd.	20	2803	832·67	3497
Clean up (Belingwe G.M. Synd.)	5	200	84·44	355
Eaglo A (Peard & Macdonald & Co.) ..	5	500	184·10	773
Do. (tailings)	—	255	40·40	170
East Gwanda Mines, Ltd., Geelong (W. Hogg), April	10	1000	240·22	1009
Do. May..	10	500	265·13	1114
Ella's (D. Vincent)	5	200	41·52	174
Farvie (Rhodesia, Ltd.) (clean up) ..	—	—	2·56	11
Gertie (Leach & Agar), April	3	143	37·46	157
Do. May..	3	62	8·92	38
Glen (A. Fraser)	3	390	95·11	399
Glenmark (A. D. Hall)	5	280	96· 0	403
Do. (tailings)	—	300	25·33	107
Intabanenda 2 S. (Estate of B. Smallie, deceased)	5	42	8 00	33
Do. (tailings)	—	65	6·17	26
Do. 1S. (do.)	(5)	246	80·39	338
Do. (tailings)	—	151	6·17	26
Kalydon (Rose Mine Synd.)	5	245	126·43	531
Kobo (Kobo Synd.)	5	80	48·59	204
Lina (W. J. Cooper)	4	180	186·66	784
Lonely Reef G.M. Co., Ltd.	152T	3589	987·01	4108
Do. (slimes)	—	3969	2371·62	9961
Matabele 3 (R. M. Nairn)	10	828	398·21	1672
N'Daba (M. Westerberg)	2	19	8·74	37
Nelly (F. D. Roscoe)	2H	1256	230·26	967
New Luck (M. Morrison)	D	1	6·42	27
New Robin A (E. T. Clayton)(tailings).	—	290	23·14	97
Northern Star and Kimono (Peel's R. Synd., Ltd.)	10	750	347·71	1460
Do. (tailings)	—	600	22·12	93
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	154P	1661	564·99	2373
Do. (tailings)	—	719	133·89	562
Pannings (W. F. Cary)	—	—	·95	4
Penzance (R. Urqhart)	2	80	12·87	54
Do. (tailings)	—	80	22·16	93
Queen's (Matabele Queen's Co., Ltd.) ..	10	1082	161·18	677
Do. (tailings)	—	709	153·89	646
Do. (slimes)	—	733	100·36	422
Queen's W. Ext. (Cumings & Berry) (tailings)	—	459	126·70	532
Rainbow (P. Allport)	5	95	7·78	33
Do. D.B.S. (do.)	(5)	12	3·40	14
Riverbank (R. Martindale) April	2	200	57·38	241
Do. do. May	(2)	150	37·21	156
Riversdale (Bruhns & Schwarz)	4	158	37·98	158
Romola Nigel G.M. Co., Ltd. (Claydon and East Queen)	5	714	193·12	811
Do. (tailings)	—	324	46·98	197
St. Patrick (J. Falk)..	2	80	18·23	77
Smiley D.B. (F. E. Davis)	5	160	30·84	130
Spiral (Joseph & Reid)	5	175	38·91	163
Suffolk (H. D. Bishopp)	5	64	35·12	147
Susanna Mines, Ltd. (Lady Lina and Susanna)	8	831	556·52	2338
Do. (tailings)	—	602	95·90	403
Do. (slimes)	—	633	86·15	362
Svithiod (G. E. H. Nisbeth)	2	19	17·48	73
Trump (J. W. Thraves) April	5	75	25·68	108
Do May..	5	20	5·79	24
Tuff Nut (King's Synd.)	5	610	398·85	1675
Do. (tailings)	—	405	37·37	157
Worthless (Smith Synd.)	5	347	50·76	213
Bulawayo District Total			13,769·89	57,832
Gwelo District—				
Arizona No. 2 (A. J. Marchant)	5	150	61·02	256
Do. (tailings)	—	350	37·09	156
Arizona No. 2S. (Williams & Woodger)	2	140	138·32	581
Beppo (J. Malcham)	6	207	71·89	302
Broad Arrow (Broad Arrow Synd.) ..	5	263	53·14	223
Do. (tailings)	—	155	13·00	55
Csarhas (Wolfshall Synd.)	10	704	263·59	1107
Do. (tailings)	—	505	87·65	368
Emerald (Sphinx Synd.)	2	35	13·00	55
Gaika G.M. Co., Ltd.	5 IC	3045	1128·37	4739
Do. (tailings)	—	1587	104·19	438
Gartley (Mrs. A. J. Grant)	2	10	74·64	313
Glenrose No. 1 (MacIntosh & Lister) ..	2	140	57·20	240
Globe and Phœnix G.M. Co., Ltd. ..	40 10P	6356	9399·29	39477
Do. (concentrates)	—	248	421·32	1770
Do. (slimes)	—	2721	422·68	1775
Guinea Fowl (Sadler & Holloway) ..	5	450	78·38	329
Do. (tailings)	—	300	28·36	119
Invulnerable (A. E. West)	5	260	60·45	254
Kings (P. S. Warden)	5	326	185·31	778
Murray tailings (J. Fischer) clean-up ..	—	—	46·59	196
Nevada (C. C. Hendrie) April	2	58	11·89	50
Do. May..	(2)	120	31·68	133
New Dunraven G.M. Ltd.	5	687	215·17	904
Do. (tailings)	—	500	19·27	81
N'Kanya (Tranmer G. Synd., Ltd.) (Mrs. R. O. Dollar)	2	50	22·93	96
North Bonsor (Cornish Synd.)	15	1756	269·14	1130
Do. (tailings)	—	1085	79·99	336
Pompei (Pharos Synd.)	2	126	55·31	232
Pretty Polly (New Rhod. R. Co., Ltd.)	5	314	114·61	481
Do. (tailings)	—	385	76·44	321
Prince George (J. H. Veasey) (tailings)	—	315	16·99	113
Selukwe Columbia G.M., Ltd.	C 3P	2620	714·54	3001
Do. (concentrates)	—	71	43·75	184
Do. (tailings)	—	1705	222·82	936
Do. (slimes)	—	500	62·17	261
Sheba-Bongola (Forbes R. Synd.)	5	140	25·84	108
Do. (tailings)	—	72	48·36	208
South Bonsor (Ideal Synd.)	10	502	44·41	187
Tebekwe (Tebekwe Synd.) April ..	(20)	1349	271·82	1142
Do. Do. (tailings) ..	—	840	30·25	127
Do. Do. May	15	950	272·30	1144
Do. Do. (tailings) ..	—	800	40·50	170
Wanderer (Selukwe) G.M., Ltd.	4GR	18800	1678·24	7129
Wild Dog (tailings) (Gilday & O'Connor)	—	400	51·37	216
Willow (W. C. Spargo)	5	225	85·12	357
Gwelo District Total			17,260·39	72,573

Matabeleland Total .. .. 31,030·28 ozs.
Value .. .. £130,405.

MASHONALAND.

Victoria District—				
Ella (R. A. MacDonald) (clean-up) ..	—	—	24·20	102
Etna (W. A. Schielke)	5	375	45·79	192
Victoria Total			69·99	294
Salisbury District—				
Abercorn (J. Seton Rogers) (tailings) ..	—	180	16·34	69
Eureka (R. G. F. Warton)	2	100	8·97	38
Gladstone A (L. Chiapaini) (tailings) ..	—	1000	50·97	214
Mont d'Or (Claxton & Bussell)	2	79	62·28	261
Old Loyalty (Shamva Ilex G.M. Co., Ltd.)	5	720	400·23	1681
Do. (tailings)	—	375	68·59	288
Radnor (Jones & Wyllie)	2	150	98·15	412
Salisbury Total			705·53	2963

	No. of Stamps.	Tons Treated.	Yield Ozs.	Value £
LOMAGUNDI DISTRICT—				
Anvil (Vilna Synd.) (tailings)	—	420	13·47	57
Do. April	—	480	27·09	114
Eldorado Banket G.M. Co., Ltd.	2C 20	6912	3641·72	15444
Do. (tailings)	—	7354	684·37	2902
Gella (Hudson & Frost)	2	18	10·84	45
Linnett (A. L. R. Morkel)	2	321	125·28	526
Tripolitania (P. Presot)	D	25	27·58	116
Lomagundi Total			4,530·35	19,204
MAZOE DISTRICT—				
Botha, H. (London and Rhodesia M. and L. Co., Ltd.)	(10)	799	136·91	581
Goth B. (Goth Synd.)	2	100	58·78	247
Hay G.M. Co., Ltd.	10 1T	1330	314·62	1334
Do. (slimes)	—	1404	387·40	1641
Honest (G. Brown)	3	110	31·27	131
Jumbo G.M. Co., Ltd.	30	2900	661·99	2814
Do. (tailings)	—	1920	389·63	1656
Do. (slimes)	—	980	117·40	499
Mickey (B. G. Byerley)	2	150	186·24	782
Night Adder (Night Adder Synd.) April	2	125	13·68	57
Do. May..		62	27·10	114
Promotor (London & R. M. & L. Co., Ltd.)	(10)	508	62·09	263
Umkulu D.B. 1W (Llahsram Synd.) ..	2	211	121·75	511
Mazoe Total			2,508·50	10,63
UMTALI DISTRICT—				
Bothwell (J. J. Milligan)	5	235	18·43	77
Cairn Dhu 2W (Parseval Synd.)	5	520	41·15	173
Do. (tailings)	—	110	5·96	25
Golden Gate 1 N (Sussex Synd.)	5	930	130·78	549
Kurwe 1 N.W. (S. Russell) April	3	22	4·26	18
Liverpool (R. G. Snodgrass)	5	720	95·12	399
Do. (tailings)	—	260	46·08	194
Mecca (Umtali Waterfall Synd.)	10	760	152·76	648
Do. (tailings)	—	217	47·00	200
Montezuma (Odzi Trib. Synd.)	5	85	32·34	136
Palmyra (J. de G. Birch)	3	450	32·87	138
Penhalonga Mines, Ltd.	40	5400	529·13	2245
Do. (concentrates)	—	135	611·23	2537
Pilgrim 2W. (J. Meikle)	5	477	269·57	1132
Rezende Mines, Ltd...	35	4400	916·87	3890
Do. (concentrates)	—	36	139·57	592
Do. (tailings)	—	2606	496·71	2108
Rezende 1 W. A. (Imbeza Synd.) ..	10	3605	423·56	1797
Do. (concentrates)	—	9	65·64	267
Umtali (Umtali Waterfall Synd.)	(10)	561	187·80	789
Do. (tailings)	—	341	31·61	133
Do. (slimes)	—	200	23·39	98
Umtali Total			4,301·82	18,145
HARTLEY DISTRICT				
Battlefields (Minaar & McArthur)	2C	1787	438·73	1803
Do. (tailings)	—	1787	145·06	609
Blue Rock (Ellsmoor & Goodyer)	2	152	50·34	211
Do. (tailings)	—	130	51·90	218
Brilliant (Mabel's Luck Synd.)	5	310	259·41	1090
Do. (tailings)	—	156	34·37	144
Buller (J. Gunn)..	5	480	98·80	415
Do. (tailings)	—	380	87·84	369
Butterfly, 1 NE (F. W. G. Richards) (tailings)	—	700	70·07	294
Cam and Motor G.M. Co., Ltd. (tailings)	—	1374	397·51	1688
Concession Hill and W. Exten. (C. E. Simpson)	51 C3 Pans	2310	479·02	2012
Crown H. (Crown Synd.)	2	200	39·79	167
Do. (tailings)		170	27·63	116
Dalny (P. Wiggins, Ltd.) (slimes) ..	—	350	44·78	188
Eiffel Blue & E. Extn. (Willoughbys Con. Co., Ltd.)	10	1318	654·07	2747
Do. (tailings)		810	47·95	201
Giant Mines of Rhodesia, Ltd.	30 2T	11450	4213·74	17873
Glasgow Mines, Ltd. (tailings)	—	275	21·32	89
Glasgow D. (R. McInnes)	C	135	18·32	77
Glencairn No. 3 (Glenrosa Synd.)	4	432	280·46	1178
Do. (tailings)	—	297	44·59	187
Golden Valley (J. Mack)	5	590	175·74	738
Do. (tailings)	—	280	60·88	256
Goldmore (tailings) (B. Secretan)	—	150	7·44	34
Great Tontine (Yellow Jacket Synd.) ..	2	220	34·96	147
Grogram (Union (Mash.) Synd.)	5	328	44·18	186
Do. (tailings)	—	260	16·15	68
I.X.L. (Heroine G.M. Co., Ltd.)	2	250	52·31	220
Kanyemba (Kanyemba Synd.)	5	300	361·34	1530
Do. (tailings)	—	215	85·54	359
Little Kitty C. (A. Buchanan)	3	40	15·25	64
Mali (McAdams & Harrill)	2	185	101·08	424
Masterpiece G.M. Co., Ltd.	5	637	270·08	134
Do. (tailings)	—	450	68·76	289
Moliere (H. Moser)	5	670	140·73	591
North Star (Try Again Synd.)	(5)	580	82·81	348
Oleander G.M. Co., Ltd., (Oleander & Arlanazer)	3	162	104·70	440
Do. (tailings)	—	162	26·66	112
Owl (A. Rolfe)	10	1400	490·06	2058
Do. (tailings)	—	937	180·48	758
Paarl (Union (Mash.) Synd.)	5	341	60·41	254
Peacock (Wellington Mines, Ltd.) ..	5	435	130·38	548
Do. (tailings)	—	270	20·00	85
Peggy 1, N.E. (J. Buchanan)..	(3)	15	2·93	12
Pickstone, 1E. (S. L. Synd.)	4	480	420·50	1766
Do. (tailings)	—	350	168·71	709
San Toy (C. R. Peacock) (tailings, clean-up)	—	--	74	3
Seigneury (Central Mining and Investment Corporation., N. A. Arnold)..	5	305	70·12	294
Shepherds (Phœnician Synd.)	7	645	285·31	1198
Do. (tailings)	—	530	200·51	842
Sid (Sebakwe & District Mines, Ltd.) April	5	386	141·62	595
Do. May..	—	670	208·74	877
Try Again (Try Again Synd.)	5	140	13·05	55
Tyne (Kimberley Tyne G.M. Co., Ltd.)..	C	1500	401·37	1686
Unknown (Brooks & Martin)	2	56	19·65	82
Washington (I. L. Minaar)	5	300	446·54	1875
Do. (tailings)	—	280	34·08	144
Whistlecock 1 W. (T. McDowell)	2	175	22·68	96
Do. (tailings)	—	160	42·10	177
Hartley District Total			12,517·49	52,766

MASSONALAND TOTAL .. .. 24,633·68 ozs.
VALUE .. .. £104,002.

SUMMARY.

Gold—	ozs.	Value.	
Matabeleland	31,030·28	..	£130,405
Mashonaland	24,633·68	..	104,002
Total	55,663·96	..	£234,407
Silver	14,872·62	ozs.	1,696
Chrome Iron	1,960·00	tons.	4,375
Lead	50·53	tons.	729
Coal	16,067·00	,, (Sales)	5,336
TOTAL VALUE MAY OUTPUT			£246,543

The Nature of Gases in Coal Mines.

At the Birmingham University last month, Sir Henry Cunynghame, K.C.B., delivered an address upon "Modern Theories as to the Nature of Gases in Coal Mines." He urged that not enough was known among students, let alone among mine managers and miners, about the startling and almost unbelievable theory of gases known as the kinetic theory. It was, however, necessary to master that theory if the subject of gas explosions in mines was to be understood. Unfortunately, it had not been put plainly in any text-books, and it was enveloped in a perfect fog of mathematics, and very difficult mathematics at that. He knew the theory would not assist them in getting coal from the mine, but it would, he hoped, result in the finding of some simple remedy for explosions.

High Mining Salaries

EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings; Box 2061.

FEATURES OF THE RAND INDUSTRIAL YEAR REVIEWED.

Points from Goerz & Co.'s Consulting Engineer's Report.

In the course of his annual report, Mr. W. McC. Cameron writes as follows about the Rand in general, and the mines of his group in particular:—"The mining industry of the Witwatersrand," says Mr. Cameron, "during the year 1911 has, as a whole, shown progress in some respects, although the native labour question, which has been always a more or less troublesome factor, has in the past interfered more seriously than ever before with the position which the industry should have reached, a point which is more fully dealt with below. The customary tabular statement showing the results obtained for the year on the Witwatersrand only, as compared with 1910, is given below:—

	1910.	1911.		
Natives employed in Dec. ..	181,707	182,958	Inc.	1,251
Whites employed in Dec.	24,342	24,171	Dec.	171
Stamps crushing in Dec. ..	9,150	9,565	Inc.	415
Tube Mills working in Dec.	184	244	..	60
Tons crushed for the year ..	21,432,541	23,888,258	,,	2,455,717
Ounces fine gold recovered for the year	7,228,311	7,896,802	,,	668,491
Total value	£30,703,912	£33,543,479	,,	£2,839,657
Yield per ton	28s. 6d.	27s. 11d.	Dec.	7d.
Working Cost per ton ..	17s. 7d.	18s. 0d.	Inc.	5d.
Dividends declared ..	£8,876,085	£7,763,086	Dec.	£1,112,999

"The tonnage treated in the reduction works again shows a very large increase, brought about largely by the inception during the year of milling operations on several large producers. The entering of these large producers in the milling field and their consequent urgent demands for labour has increased the competitive measures for obtaining native labour, which were already pressing heavily on the industry and resulted in increasing the cost of such labour, to the great detriment of all the mines. This is the main and principal reason for the increase of 5d. per ton milled, or £497,672 over the whole tonnage which is shown in working costs for the year, and while the tonnage milled and total output of gold have been increased to so large an extent, the increase has been accomplished at the expense of profits. The average cost per native employed by your group of mines for wages, recruiting, feeding and housing, and all other sundry items amounted per year in 1909 to £27 10s. 6d., in 1910 to £32 4s. 10d., and 1911 to £34 17s. 1d., which spread over the average number of natives employed by the mines of the Witwatersrand in 1911, less 10 per cent. for those sick and not working, shows an increase in expenditure under this head of £1,195,039 over 1909, and £426,064 over 1910. Only concerted action of all the mines of the Witwatersrand can stop further increase in expenditure for native labour, and gradually bring it back to a normal point. There has been a constant endeavour to free the main operation of mining—that is the breaking of ore—from the enforced use of the very large supply of natives required for hand work, as this is the most important factor affecting the labour requirements of the mines. Greatly improved results are now being obtained with the small rock drill, representing improvements both in the type of drill which is now obtainable and in methods of using it; while the results obtained thus far in a small way in narrow stopes with the improved type of small air hammer drill have been such as to encourage the belief that this drill may be successfully employed after the manner of hand labour. On one of the mines controlled by your group, ore is now being broken as cheaply by this type of machine without increasing the narrow width of the stopes as was previously done by hand, and the coming year should see such further advance in these methods as will materially reduce the number of natives necessary for producing a given tonnage. There is still a wide field for saving of native labour in many occupations on the mines, a point which is having more serious attention than ever before, and the results which will no doubt be accomplished in this respect will go far towards overcoming any tendency of working costs to increase in the future. The fight against disease such as may be aggravated by working in the mines, among both white and native employees, has been carried on vigorously. The question of prevention of miners' phthisis and the alleviation of the dust evil (the cause of this disease in the mines) has been grappled with in no half-hearted manner. The apathy of miners themselves is the greatest difficulty with which the managements have to contend, and for that reason progress is doubly hard to achieve. High pressure services of clear water have been, or are being, extended to every working face in the mines, and by good organisation, efficient supervision, and proper application of water it is anticipated that results worthy of note will be obtained. In this connection the Government have appointed a Standing Committee on the prevention of miners' phthisis, consisting of the leading Government mine officials, the consulting engineers of the groups, practical miners, and others, and the mines have opened a miners' phthisis sanatorium for the treatment of the disease. The Witwatersrand Native Labour Association is establishing a bacteriological laboratory for the study of diseases of mine employees, and the services of the eminent pathologist and bacteriologist, Sir Almroth Wright, and staff were obtained to conduct an investigation into the very heavy mortality among natives from pneumonia, an investigation which gives evidence of resulting in much good. The death rate among natives and the percentage of desertions from service have both been lowered during the year. A new Mines and Works Act with regulations under the Act came into force on December 1st. The principal points in the new law affecting the mines are the limitation of working hours to an eight-hour day at the face for underground employees, which is not altogether satisfactory and will probably result in decreased white wages and decreased efficiency of white and native labour, and the alteration in the Sunday law which places a ban on Sunday working of mills which may be erected after the date on which the Act came into force. There are also numerous additions and alterations to the regulations under the Act, the cumulative effect of which is to throw some burden of expenditure on the industry. The Mines Trials Committee has conducted several important investigations into the methods of carrying out certain operations and with plant and mechanical devices for securing cheaper and better recovery of gold, though no important successes can be recorded during the year. The changes in metallurgical methods which were noted in the past two years are fast becoming portions of the established practice. The elimination of amalgamation plates in front of the stamps and restriction of amalgamation to practically the tube mill circuit, the use of stationary amalgamating plates fewer in number instead of shaking tables for this purpose, all resulting in increased extraction with less plate area, the use of sand filter tables for collection of sands giving more efficient classification and cyanide treatment, and the introduction of the filter press for separating gold-bearing solution from slime, affording a higher extraction than with the decantation process, are the principal features under this head. In the tin fields of the Northern Transvaal no new discoveries of importance have been made though generally much prospecting work has been carried on in these fields. Various propositions in outside districts have been examined, none of which, however, has proved attractive. The following statements shows the production for the year of the milling mines in which you are principally interested:—May Consolidated: Tons milled, 184,470; value of gold produced, £259,789. Lancaster West: Tons milled, 258,943; value of gold produced, £294,025. Princess Estate: Tons milled, 166,368; value of gold produced, £248,582. Geduld Proprietary Mines: Tons milled, 138,660; value of gold produced, £185,520. Total tons milled, 748,441; total value of gold produced, £987,916. The average value of the yield per ton milled was 26s. 4·7d. as against 26s. 2·78d. in 1910, and working costs averaged 20s. 7·9d. per ton milled as against 20s. 4·5d. in 1910.

IRRIGATION PROGRESS UNDER THE UNION GOVERNMENT.

Some Statistical Records of the Irrigation Department—Works in Contemplation—Details of New Projects.

The figures given below, taken from the annual report of the Director of Irrigation, represent what may reasonably be expected to be the scope of works undertaken or about to be undertaken as the result of departmental assistance during the year. They do not include, however, the schemes in connection with which only informal advice was given, nor schemes undertaken or enlarged without reference to the Department, and under this latter heading there must fall a great number of small schemes which represent in the aggregate a very large area of new irrigation. The statement shows the results by provinces, and the schemes are further analysed under the headings of storage schemes, canals leading directly from rivers, and pumping schemes. In thirty cases the statistics available are incomplete, and they have been omitted, though they represent an approximate irrigable area of 6,300 acres, or, say, 3,000 morgen. The total for the year amounts to 76,322 acres of new land brought under irrigation in the Union at a cost of £257,110, or £3 8s. per irrigable acre. It will be seen that irrigation activity in the Cape, which accounts for 90 per cent. of the total now irrigable area, vastly preponderates, but as soon as improved legislation is given to the Free State and the Transvaal, it is hoped that the great disproportion between the Cape and the rest of the Union will become less. Natural conditions make it inevitable, however, that irrigation development in the Cape and Southern Orange Free State will for a long time proceed at a much more rapid rate than will be the case in the Transvaal, Natal and Northern Orange Free State, where irrigation on an extended scale is a matter of relatively less importance to farmers. The climatic and hydrographic conditions in the northern portion of the Union make the extension of irrigation, to a very large extent, dependant upon the construction of costly storage works, which in itself does not tend to the rapid progress in a country where irrigation is neither so profitable nor so essential as is the case in the more arid parts of the Union.

Statement Showing Irrigation Development in the various Provinces as the Practical Result of the Operations of the Irrigation Department during 1911.

Class of Work.	Class of Assistance by Government.	No. of Cases.	Estimated Cost of Works.	New Land brought under Irrigation.
CAPE PROVINCE—			£	Acres.
Storage	Advice	30	68,441	7,660
	Loans	4	1,900	267
Canals	Advice	74	45,290	38,411
	Loans	9	103,110	20,984
Pumping Schemes	Advice	12	8,667	847
	Loans	5	4,350	1,565
Totals for Cape.. ..	..	134	£231,758	69,734
TRANSVAAL PROVINCE—				
Storage	Advice	18	11,431	1,334
Canals	,,	15	1,245	1,975
Pumping Schemes	,,	4	1,935	398
Totals for Transvaal ..	..	37	£14,611	3,707
ORANGE FREE STATE PROVINCE—				
Storage	Advice	2	1,880	496
Canals	,,	5	100	911
Pumping Schemes	,,	6	6,516	1,057
Totals for Orange Free State	..	13	£8,496	2,494
NATAL PROVINCE—				
Storage	Advice	—	—	—
Canals	,,	—	—	—
Repairing Schemes... ..	,,	6	2,245	387
Totals for Natal ..		6	£2,245	387
GRAND TOTALS FOR UNION.	..	190	£257,110	76,322

NOTE.—Loan Cases consequent upon Government Advice are included in Advisory cases.

Particulars are given in the attached statement of irrigation projects, the cost of which individually are in excess of £8,000, and which were either under construction during the year or are about to be commenced in accordance with a fully worked up project. There are quite a number of schemes under consideration, and likely to be commenced in the near future, the cost of which will exceed £10,000, but these are not shown.

I.—KLIPDRIFT SCHEME.—POTCHEFSTROOM, TRANSVAAL.

Reservoir.—Area of reservoir at F.S.L., 47 mill. sq. ft.; total full supply storage, 442·8 mill. cub. ft.; loss by evaporation, 123·0 mill. cub. ft.; net storage, 319·8 mill. cub. ft. *Dam.*—Nature, earth bank; top length, 5,290 ft.; maximum height, 40 ft.; top width, 6 ft.; profile, 3 to 1 upstream, 2½ to 1 downstream. *Waste Weirs.*—Description, drowned channel; length, 400 ft.; discharge capacity, 8,888 cusecs. *Headworks or Weir.*—Description, two outlet culverts; sluices, R.B. 2 ft. x 2 ft., L.B. 2 ft. x 2 ft.; discharge to furrow, R.B. 20 cusecs, L.B. 20 cusecs. *Canals.*—Length R.B., 5 miles; length L.B., 5 miles; discharge capacity R.B., 20 cusecs; discharge capacity L.B., 20 cusecs. *Land.*—Area commanded R.B., 950 morgen; area commanded L.B., 950 morgen. *Cost.*—Total cost of project, £60,000.

II.—GOEDE MOED SCHEME.—NEAR ALIWAL NORTH AND IN ORANGE FREE STATE.

Headworks or Weir.—Description, weir across Orange River; length, 1,650 ft.; height, 7 ft.; sluices, pumping turbine plant raising 10 cusecs from a headrace 3,000 ft. long, of 120 cusecs discharge; dischage to furrow, 10 cusecs. *Canals.*—Length R.B., 5 miles; length L.B., 7 miles distributaries; discharge capacity R.B., 10 cusecs. *Land.*—Area commanded R.B., 500 morgen. *Cost.*—About £40,000, including £12,000 for purchase of farms.

III.—KOPJES SCHEME.—NEAR KOPJES STATION, O.F.S.

Reservoir.—Area of reservoir at F.S.L., 67 mill sq. ft.; total F.S. storage, 542·21 mill cub. ft.; loss by evaporation, 74·32 mill. cub. ft.; net storage, 467·92 mill. cub. ft. *Dam.*—Nature of dam, concrete with earth flank embankments; length of dam on top, 3,615 ft.; maximum height, 60 ft. *Waste Weirs.*—Description, drowned channel; length, one each bank, total length 400 ft.; discharge capacity, 28,500 cusecs. *Headworks or Weir.*—Description, two outlet sluices through concrete dam; sluices, (1) 4 ft. x 2 ft.; discharge of furrow, 89 cusecs. *Canals.*—Length R.B., 12 miles plus 12 miles; length L.B., 4 miles; discharge capacity R.B., 89 cusecs (22 cusecs N. canal); discharge capacity L.B., 10 cusecs (estimated). *Land.*—Area commanded R.B., 2,000 morgen; area commanded L.B., 700 morgen. *Cost.*—Total cost of project, £100,000, including about £21,000 for purchase of farms for settlement.

IV.—OLIFANTS RIVER SCHEME.—CLANWILLIAM (CAPE).

Dam.—Nature of dam, masonry with shutter crest; length of dam on top, 680 ft.; maximum height, 21 ft. solid, 3 ft. shutter; top width, 5 ft. 6 in. *Waste Weirs.*—Description, over weir crest; length, 680 ft. *Headworks or Weir.*—Description, 3 sluice openings; sluices, three 6 ft. wide; discharge of furrow, 93 cusecs. *Canals.*—Length R.B., distributaries 32 miles; length L.B., 71 miles mains; discharge capacity L.B., 93 cusecs. *Land.*—Area commanded R.B., 1,900 morgen; area commanded L.B., 4,700 morgen. *Cost.*—Total cost of project, £154,710.

V.—DUIVENHOKS SCHEME.—VIA HEIDELBERG (CAPE).

Headworks or Weir.—Description, weir across Palmiet stream; length, 132 ft. 6 in.; height, 10 ft.; sluices, two; discharge of furrow, 15 cusecs. *Canals.*—Length R.B., 10½ miles, length L.B. 4½ miles, one main canal total 15 miles;

discharge capacity R.B., 15 cusecs. *Land.*—Area commanded R.B., 1,430 morgen. *Cost.*—Total cost of project, £25,000.

VI.—ZANDDRIFT SCHEME.—BREEDE RIVER.

Headworks or Weir.—Description, weir across Breede River; length, 500 ft.; height, 5 ft.; sluices, two 6ft. x 3 ft.; discharge to furrow, 51 cusecs. *Canals.*—Length R.B., 7½ miles; length L.B., 9 miles and widening of Bonnie Vale Canal; discharge capacity R.B., 20 cusecs; discharge capacity L.B., 15 cusecs. *Land.*—Area commanded R.B., 1,200 morgen; area commanded L.B., 1,000 morgen. *Cost.*—Total cost of project, £25,000.

VII.—LE CHASSEUR AND GOREE SCHEME.—BREEDE RIVER.

Headworks or Weir.—Description, weir across Breede River; length, 325 ft.; height, 4 ft.; sluices, two R.B. 6 ft. x 3 ft. 3 in.; discharge to furrow, 44 cusecs. *Canals.*—Length R.B., 22 miles main canal, 8½ miles distributaries; length L.B., 9 miles distributaries. *Land.*—Area commanded R.B., 1,770 morgen; area commanded L.B., 880 morgen. *Cost.*—Total cost of project, £25,000.

VIII.—STRATHSOMERS ESTATE SCHEME.—SUNDAYS RIVER.

Headworks or Weir.—Description, weir across Sundays River, stone and wire reinforced; length, 282 ft.; height, 17 ft.; sluices, none; discharge to furrow, 355 cusecs. *Canals.*—Length R.B., nil; length L.B., 9 miles. *Land.*—Area commanded, 5,100 morgen. *Cost.*—Total cost of project, £23,000.

IX.—KLIPFONTEIN SCHEME.—FISH RIVER.

Headworks or Weir.—Description, weir across Fish River (stone); sluices, tunnel 618 yds. long, 6 ft. x 5 ft.; discharge to furrow, 81 cusecs. *Canals.*—Length R.B., 11 miles; length L.B., 7 miles; discharge capacity R.B., 80 cusecs; discharge capacity L.B., 20 cusecs. *Land.*—Area commanded R.B., 900 morgen; area commanded L.B., 700 morgen. *Cost.*—Total cost of project, £15,000.

X.—SEACOW RIVER SCHEME.

Headworks or Weir.—Description, weir across Seacow River (stone in cement mortar); length, 209 ft.; height, 9 ft.; sluices, two 4 ft. and 2 ft.; discharge to furrow, 20 cusecs. *Canals.*—Length R.B., 8¼ miles; length L.B., 5¾ miles; discharge capacity R.B., 20 cusecs; discharge capacity L.B., 5 cusecs. *Land.*—Area commanded R.B., 230 morgen; area commanded L.B., 160 morgen. *Cost.*—Total cost of project, £8,800.

XI.—TARKA BRIDGE IRRIGATION DISTRICT.—CRADOCK.

Headworks or Weir.—Description: Left Bank Scheme—Weir across Tarka River (stone in cement mortar); length, 305 ft.; height, 10 ft.; sluices, two 5 ft. x 3 ft. 3 in.; discharge to furrow, 44 cusecs; Right Bank Scheme—Old masonry weir across Tarka River raised 1 ft. 6 in. by addition of concrete cap; length, 353 ft.; height, 7 ft. 6 in.; sluices, two 5 ft. x 2 ft.; discharge to furrow, 34 cusecs. *Canals.*—Left Bank Scheme—Length, 12½ miles and 4 miles high level; discharge capacity, 44 cusecs; Right Bank Scheme—Length, 9½ miles; discharge capacity, 34 cusecs. *Land.*—Right Bank Scheme—Area commanded R.B., 400 morgen; Left Bank Scheme—Area commanded L.B., 1,500 plus 200 morgen. *Cost.*—Total cost of projects: Left Bank Scheme, £11,700; Right Bank Scheme, £2,000.

GOVERNMENT BORING OPERATIONS.

Official Account of Success in Finding Water in Dry Areas—How Farmers are Aided—A Year's Work Reviewed.

DURING the year 1911 the operations of the Boring Branch of the Irrigation Department have been carried on without interruption in the Transvaal and the Cape districts. As will be seen by the accompanying comparative statement, there has been a marked advance over previous years in the footage drilled and the amount of water obtained. In all, 616 boreholes, with an aggregate depth of 83,987 feet, were drilled, and yielded a total estimated daily supply of 11,281,000 gallons. As stated in the short supplementary report for the period 1st June to 31st December, 1910, the drill operating in Bechuanaland, and lately under the direction of the Cape Public Works Department, was brought under the control of the Department in November, 1910. This, with the addition of one new shot drill acquired during the year, brought the total number of efficient drills in the possession of the branch up to 53. Of these, an average of 48 were working in the field, the remaining machines being either under repair or idle for lengthy periods on account of operations being suspended in fewer areas. During the year drills have been at work in all the districts of the Transvaal, with the exception of Piet Retief and Barberton, from which quarters no applications for the services of drills were received. We take the following from the annual report of the Director of Irrigation:—

Bechuanaland.—During the latter part of 1910 investigations were conducted in Bechuanaland with a view to a resumption of boring operations on the surveyed vacant farms in the first Railway Grant, situated some sixty miles to the west of the town of Vryburg. Some 48 boreholes had previously been sunk by the Cape Government in this area, with but indifferent success, only some 33 per cent. of the holes having been successful. As it was thought that better results might be obtained by careful selection of sites and by deeper boring, two drills were despatched to this area in the early part of 1911, and have since been operating there with a fair measure of success. In all, fifteen boreholes have been drilled, and in ten of these good supplies of water have been obtained. These results, in view of past failures on a number of the farms, may be considered satisfactory. Experience has shown that water in any quantity is only to be looked for in the gneiss areas, and then sometimes at a depth of over 300 feet. The result of the successful operations on this block of farms has been almost to double the price of land in the neighbourhood, and the submission of numerous applications for the services of the drills on privately owned farms in the vicinity of the Railway Grant. The majority of applicants for these farms are men with comparatively small capital, who, after fencing and stocking their holdings, and building the most primitive of dwellings, are unable to meet the cost of boring and digging wells, even if the payment for such work is spread over a period of five or six years. With an assured water supply at the commencement of his venture, an allottee is relieved of a heavy handicap. Instances of men who have spent large sums of money in unsuccessful prospecting for water in a number of shallow wells are numerous throughout the country. The money thus wasted might have been profitably invested in stock, or gone towards payment of instalments for the land, had boreholes been sunk before the farms were allotted. Much yet remains to be done in making habitable the large tracts of Government ground at present lying idle and useless by providing water supplies, and a vigorous policy in this direction has been decided upon. The development due to successful boring on private farms is already evident in almost every district in the Transvaal, and, undoubtedly, equal advantage and profit will result from boring on Crown Lands. Boreholes have been drilled for the South African Railways on the Pietersburg-Bandolier Kop Extension and the Springs-Ermelo Line in the Transvaal, and on the Heilbron Branch in the

Free State Province, and water supplies obtained where required. At Delmas, in the Transvaal, one of the most successful boreholes yet drilled by the Department yielded an estimate daily supply of 150,000 gallons. This hole, which throughout was in dolomite and chert, is 8 inches in diameter, 195 feet deep, and cost the South African Railways £325 12s., should be the means of effecting a large saving, as previous to the provision of this large supply, tanks of water had constantly to be railed to Delmas Station to provide water for locomotives on this busy section of the line. The rate of boring for Government Departments, viz., 23s. 8d. per foot, is somewhat in excess of the figure at which this work has been carried out in previous years, the increase being in a large measure due to the extension of boring to areas far removed from railway communication, and to the heavy cost of transporting plant to the boring sites in the first instance, and stores, etc., over long distances. At the commencement of boring operations in any new and sparsely populated country, the provison of water and fuel for working the boring machine presents great difficulties, and, in consequence, is comparatively expensive. In Bechuanaland, where wood is more or less plentiful, fuel is obtainable at reasonable rates, but for the first one or two boreholes 400 to 600 gallons of water had daily to be transported 12 to 15 miles over heavy sandy country without roads or even tracks, while for the boring on Crown lands, Bushmanland, which is practically devoid of timber, and where farms are large and generally unoccupied, coal had to be transported from the railhead at Prieska for a distance of 200 miles at a cost of 6s. per 100 lbs., and water carted to the site of operations at a cost of from 25s. to 30s. a day. These adverse conditions naturally militate against cheap boring, but, as development proceeds, and the water already obtained in boreholes can be utilised for operations on adjoining ground, it is anticipated that working costs will be materially reduced. During the year 495 boreholes, with an aggregate depth of 63,676 feet, have been drilled for farmers and others under the Boring Regulations, and have yielded an estimated total supply of 9,271,000 gallons per diem. This work has entailed an expenditure by Government of £29,631, of which amount £14,500, or roughly 50 per cent., is recoverable from applicants who have had the use of the drills. During the year one shot drill (type S.R. 2) was purchased from Mr. A. McNamara, the manufacturer of these machines. This drill, which is capable of boring a 6 inch hole to a depth of 600 feet, differs from the shot drills already in the possession of the Department, in that it has no percussion drilling attachment, and the boiler, instead of being on a separate carriage, is fitted to the frame of the drill proper. The whole plant is easy to transport, and its efficiency has been proved while boring in the highly-inclined Malmesbury beds on Robben Island, where other types of drills have previously failed to get beyond a depth of 80 feet. At the 31st December, 1911, the following drills were in the possession of the Department: Two "P. Sullivan" diamond drills—stored; four "H. N. Sullivan" diamond drills—stored; two "C. and G." diamond drills—stored; one "C. and G." (hand) diamond drill—stored; ten "McNamara" percussion drills; twenty-nine "Nos. 3 and 23 Star" percussion drills; six "No. 2 Star" percussion drills; six combined shot and percussion drills; one shot drill. The nine diamond drills, which have been discarded for water boring on account of the small diameter of the hole bored by them and the high working costs of this class of machine, are not in active operation, but are retained, and will, as opportunity occurs, be utilised for drilling deep experimental holes of small diameter and for testing the ground and formation at the sites of proposed reservoirs, bridges, etc. The 53 efficient percussion and shot drills in the field are all in a good state of repair. With a view to eliminating the heavy charges for the transport of fuel and water necessary for the running of steam-driven drills, orders have been placed for a petrol-driven percussion drill and two internal combustion engines. The latter will replace the steam engines and boilers at present fitted to two of the percussion drills now owned by the Department. After experiments have been conducted and the suitability and reliability of these machines have been proved, it is proposed to employ them in the dry north-west districts of the Cape Province, and thus reduce working costs. The following are the corrected figures in connection with work performed and results obtained from the 1st June to 31st December, 1910: Average number of drills working, 45; number of applications received, 225; number of boreholes completed—Government, 43; farmers, etc., 308; total, 351; feet drilled, 45,771; total cost, including depreciation, £25,672; working cost per foot, 11s. 3d.; estimated quantity of water obtained in gallons per diem, 7,830,000. Boring executed, costs of work and results obtained during the year 1911: Average number of drills working, 48; number of applications received, 365; number of boreholes completed—Government, 121; farmers, etc., 495; total, 616; number of feet drilled, 83,987; approximate quantity of water obtained in gallons per diem, 11,281,000; total cost, including estimated depreciation, £53,699; working cost per foot, 12s. 9d.

Blaauwbosch Diamonds.

The washing returns for June of the Blaauwbosch Diamond Company are:—8,945 loads treated, producing 1,911½ carats, or 21·40 carats per 100 loads.

Manicaland Mineral Output.

The mineral output of the Territory of the Companhia de Mozambique (Manicaland) for the month of May, 1912, was as follows:—Reef: Mill—Gold won (fine gold), 81 ozs. 15 dwts. 19 grs.; tons crushed, 481; value, £313 9s. 7d.

Covered Coal.

Late Westphalian experiments seem to indicate that little is gained in attempts to preserve coal by excluding air under water or in special atmospheres. The tests were made with lumps about three-quarters of an inch in diameter, a portion being placed in half-gallon jars under water, carbon-dioxide flue gases or sulphurous-acid vapours, and another portion being exposed in the open air. Though different coals gave unequal results, the loss of gas was not much influenced in any case by the protective treatment. It was recommended that, if anything is to be done, the coal piles should be provided with roofs, and thermometers should be inserted so as to obtain warning of any tendency to spontaneous combustion.

New Eland Diamonds.

The washing results of the New Eland Diamond Company for June are:—Loads washed, 7,004; diamonds recovered, 1,515 carats, or 21·63 carats per 100 loads.

The Ivy to Restart.

Messrs. Carlin, Chew and Byass have taken over the Ivy mine, says the *Goldfields News*, and intend making an early start. Mr. Byass is taking charge. This mine has been lying idle for some time.

East Rand Proprietary Mines.

The result of last month's operations at the East Rand Proprietary Mines are as follow:—820 stamps milled 152,850 tons; 58,827 ounces of fine gold were recovered from all sources; £92,256 profit was made for the month.

ANSWERS TO CORRESPONDENTS.

"Tins" (Bloemfontein).—Enquiries are being made.

"W. W."—Until further work is done, letter left alone.

"Randtontein."—It is understood that no change will be made for the present.

"Hopeful."—Your letter breathes libel in every line.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Stope Timbering.

To the Editor, *South African Mining Journal.*

Sir,—I agree with my critic that wedges are theoretically unnecessary, if the true bevel is cut top and bottom of stick. If Mr. Wilkes reads my article again, he will find that I was careful to mention the taking of the angles and hanging and bottom of hitch make with the line at which the stick is to be put in, and the cutting of the stick to those angles. Nevertheless, I think he will agree that the stick need be cut wrong by barely more than the thickness of a crosscut saw, to allow a wedge to be driven part of the way at least. To show the wedge at all in my sketches, I had to exaggerate the angle between the bottom of the stick and the foot of the hitch. The wedge in the foot will not rot any quicker than the foot of the stick. The Cornish saying, "Let the stick well fill the hitch," which he quotes, expresses my argument and agrees with my article entirely. I said, "The hitch must be cut to fit the stick, not the stick to fit the hitch." The Cornish saying refers to the full diameter of stick, not the little bit left after the "chopper" has been at work. My critic takes exception to my statement, "This angle is called the underlie." I cannot be called dogmatic, because I simply made a statement in fact. The correct term for the angle *underlying* the timber is *underlie*. I am not responsible for it, nor did I hear it in a classroom.—Yours, etc.,

THE WRITER OF THE ARTICLE.

Seccoceni Copper Co.

To the Editor, *South African Mining Journal.*

Sir,—I would esteem it a favour if you could give me any information of the Seccoceni Copper Company, Ltd., floated from Durban about five years ago. I have written to the secretary on several occasions this last two years, but I have received no answer on any of them, and my letters have not been returned. I know the company obtained discovery rights over two farms in respect of chrome ore. Why I am writing to you is because I remember in your issue of August 8th last you had an article *re* chrome ore, and I think the farm Mooihoek you mentioned is one of the farms the company is interested in. So I thought you might get some information from that source, both for myself and other Rand shareholders who would be glad of any information of what the company is doing with the property. Thanking you in anticipation.—Yours, etc.,

CHROME ORE.

Johannesburg, June 29.

City Deep Title.

FEDERATION COMPANY'S ACTION TO PROCEED.

To the Editor, *South African Mining Journal.*

Sir,—We have been instructed to send you a copy of a cable, which has to-day been despatched to our London office, for the information of all European shareholders. Will you also please publish the following letters dated the 2nd and 3rd inst., from Mr. E. George Mawby, who, throughout the negotiations, has had full power of attorney to deal for the Federation Company, Ltd. At Mr. Mawby's request, the concluding portion of his letter of the 2nd of July has been omitted, as it refers to a matter which does not affect the main portion, dealing with the withdrawal of the action of the Federation Company, Ltd., against the City Deep, Ltd.—I am, etc.,

S. C. STEIL,
Joint Secretary.
Rand Mines, Limited.

July 3, 1912.

Copy of cable sent to London office, 3rd July, 1912:—"E. George Mawby, attorney of the Federation Company, has to-day written to the solicitors of the City Deep stating that he has received instructions lodge appeal in Bezuidenhout action, and to apply to Court that hearing City Deep action stand over until appeal decided. Mawby further withdraws his yesterday's letter, in which he notified solicitors City Deep that Federation Company would not proceed with action against City Deep. Mawby has throughout had full power of attorney act for Federation Company. His letters are being published locally. Publish."

Copy of letter from the Federation Company, Limited, Johannesburg, to Messrs. Van Hulsteyn, Feltham and Ford, solicitors, Johannesburg.

Johannesburg, July 2, 1912.

Dear Sirs,—Having regard to the decision of the Court in the recent action of the Company v. Bezuidenhout and Others, and consequent on my conversation with Sir William van Hulsteyn on the day on which judgment was delivered, I beg to notify you that I am instructing my solicitors to withdraw this action. . . . —Yours faithfully,

E. GEORGE MAWBY.

Copy of letter from the Federation Company, Limited, to Messrs. Van Hulsteyn, Feltham and Ford.

July 3, 1912.

Dear Sirs,—Since writing you my letter of yesterday's date, I have received instructions to lodge an appeal in the Bezuidenhout action, and to apply to the Court for an Order that the hearing of the City Deep action stand over until after the appeal has been decided. Kindly, therefore, note that I withdraw my letter of yesterday's date.—Yours, faithfully,

E. GEORGE MAWBY.

Fatalities on the Mines of the Rand.

To the Editor, *South African Mining Journal.*

Sir,—In your last issue Mr. Samuel Evans wrote attempting to throw discredit on the figures compiled by Mr. J. K. Leyds, Librarian to the Mines Department, with the object of showing the death-rate by accident per thousand employed in the different mining countries of the world. I am not aware that even the compiler will claim that the figures are absolutely correct to the extent of a few deaths only, but they are, of course, compiled from official publications principally, and may therefore be taken as equally reliable with those of the Transvaal, and only of use for comparative purposes between the same countries. Even then the comparison resulting may be to some extent fallacious, but on grounds quite different to those urged by Mr. Samuel Evans. For a compilation of mining accidents to be of the value generally expected, it must be restricted to those countries where the mining conditions are at all events to a large extent the same, and as all the mining conditions, natural and artificial, in any two countries are not precisely alike, a reliable compilation is altogether in this respect out of the question. The most that can be expected of such a compilation is to give an idea of the relative number of accidents occurring in different countries, and only those with actual personal experience of the mining conditions and methods adopted in compiling the accident returns in those countries are able to make proper use and arrive at reliable conclusions on the many aspects presented by such mining accident returns. Mr. Samuel Evans appears to consider that the accident returns of the Transvaal are far more reliable, and include a far larger proportion of the accidents occurring than those of any other mining country of the world. As a matter of fact this is not the case, and, judging from what I have actually seen in the Transvaal and other parts of the world where mining operations are regulated by Acts of Parliament, I should almost be inclined to say that the accidents, fatal and otherwise, reported to the Mines Department here, form a smaller proportion of those actually occurring, for different reasons, than in any other mining country in the British Empire. On the Rand, however, most of the accidents are reported, but in the outside districts I have known of many accidents, some fatal, but mostly serious, which were never reported to the Mines Department at all. This may, perhaps, explain why accidents in the outside districts of the Transvaal appear to be less numerous than on the Rand. In all other parts of the British Empire where mining regulations exist, far more efficient and capable mining inspectors are appointed than is the case in the Transvaal, simply because they are better paid, or enjoy greater advantages, than the mine managers over whom they are expected to exercise supervision. It is generally considered bad policy to employ underpaid, and consequently inefficient and inexperienced, officials in the Government Mines Department. For the compilation of accurate accident returns, an adequate number of, as well as qualified, mine inspectors must be appointed, and I know of fatal accidents reported in the Transvaal which, owing to the Mines Department being shorthanded, were not investigated by a Mines Inspector. Such inability to investigate fatal accidents is, naturally, likely to lead to neglect to report accidents in the future, especially in a country where such little importance is attached to what happens to a native. Mr. Samuel Evans may be surprised to hear that in some mining countries all accidents, fatal, serious, and trifling—so long as they cause one day's absence from work—are expected to be reported. In some countries death may result within a month or a year from the date of the accident to be deemed a fatal accident, whilst, I believe, in Germany death must occur at once, for purposes of National Insurance, before the Government will recognise it as a fatal accident. In England and other countries Accident Relief Societies exist, and the relatives of those injured see that such accidents are reported, otherwise they may lose their claim to benefits. There are so many varied aspects of this accident question that only those having a personal acquaintance with the actual conditions prevailing in the different countries can be considered as entitled to form a reliable judgment on the value of accident compilation returns.

The critic has had little practical experience, even in England or Wales, in reporting or dealing with mine accidents, or it would not be necessary for him to ask to be supplied with the information he desires with regard to the definition of fatal accidents, obligation of managers to supply information, exact character of such information, how often supplied, and the provisions for the official inspection into the cause of mine accidents. Nor would he suggest that death is not attributed to an accident unless the victim dies on the spot, as in Germany, for Government relief purposes, or that deaths resulting indirectly from accidents are not subsequently reported and included in the official returns. Then, again, when it is suggested that mines are rarely inspected by Government officials, accidents are not investigated, figures for isolated mines are simply guesses, and that no returns of the average number of employees are ever made, your correspondent can only be dealing with those countries where no mining regulations exist, and no mining accident compilations are therefore made, so that these countries do not come into consideration at all.

Unsatisfactory as the compilation of the world's statistics of mining accidents undoubtedly are, they are not as bad as Mr. Samuel Evans is inclined to make them appear, and that may be the reason why so little notice was taken of his previous communication on the subject to the Press some time ago. Even the diversity of mining and labour conditions in metalliferous mines all over the world makes their comparison of little service, and to compare coal mining accident returns with those of metal mines in different countries is even more absurd. Accident statistics for comparison can only be of any material value when applied to the same country, and perhaps of some slight value when compared in different countries by a person acquainted with the conditions prevailing in those countries. The mere fact, therefore, that nearly five lives per thousand employed are lost by accident every year in the Transvaal, as against 1·35 in the United Kingdom, in itself is of little value for purposes of comparison.—Yours, etc.,

VULCAN.

MINING MEN AND MATTERS.

At the time of going to press, the condition of Mr. J. G. Hamilton was unchanged.

* * * *

Dr. Hendryx, the well-known metallurgist, terminates his visit to the Rand in a few days.

* * * *

Mr. C. B. Saner, the new manager, has taken up his residence at the Luipaardsvlei Estate.

* * * *

Mr. Leslie Simson, Superintending Engineer of the Consolidated Goldfields, has returned to the Rand.

* * * *

Mr. Beatty is Acting Manager of the Witwatersrand, in the absence of Mr. Lewis, who is down with sciatica.

* * * *

Mr. F. S. Malan, Minister of Mines and Education, left Capetown this week for Pretoria. On a second visit to the North he will spend about a month on the Rand, getting into touch with the working of the Mines Department.

Mr. Henderson Clark, London Managing Director of the Anglo-French Exploration, left the Rand last week on a visit to the Rhodesian properties of the company. He will stop for a day on the Rand when passing through on his return.

* * * *

The Koffyfontein correspondent of the *Bloemfontein Friend* says: "Koffyfontein learned the news with regard on Saturday of the death of Mr. Stokes, the secretary at Kimberley for the past thirty years of the Koffyfontein Estates, Ltd. Deceased was, owing to his position, closely identified with Koffyfontein, and a frequent visitor here. In fact, it is barely a fortnight since he last visited Koffyfontein, when he appeared to be in good health."

* * * *

A sub-office of the Inspector of Mines for the Western Division of the Cape Province has been opened at 91 Parliament Street, Capetown, and will deal with all matters relating to boilers, elevators, and other machinery. All notices required to be forwarded to the Inspector of Mines under the Mines and Works Regulations, 1911, by owners or user of boilers, elevators, and other machinery in the Western Division of the Cape Province, must be sent to the above address.

THE WEEK IN THE SHAREMARKET.

A Dull Week—Closing Steady but Quiet.

This week was uneventful in the market, and ended steady if quiet. There has been a revival of interest in diamond and tin syndicates, and quite a crop of the former are now seeking public favour. Rand stocks are almost lifeless, though the news of the successful formation of a central labour recruiting agency ought to have an excellent effect. Without some public interest in the market, nothing, of course, can have any effect, and while prices remain at their present level, the public is not likely to be drawn. The few fluctuations of the week are portrayed below:—

	Friday, 28th.	Sat., 29th.	Monday, 1st.	Tuesday, 2nd.	Wed., 3rd.	Thurs. 4th.
African Farms ...	15 9	15 0B	15 3B	15 8B	15 3B	15 3B
Adair-Usher Process	1 6S	...	...	1 3S	0 9B	1 6S
Apex Mines ...	30 0	...	26 0B	27 6S	...	27 6B
Bantjes Consolidated	24 0B	24 0B	22 9B	22 9	22 3	22 0B
Benonis	4 3B	4 0B	3 9B	4 3	4 6B	5 0
Bushveld Tins ...	...	1 1B	1 1B	1 0B	1 2	...
Brakpan Mines ...	...	74 6B	...	...	74 0S	...
Blaauwbosch ...	29 6	...	20 0B	21 0B	...	...
British S A. ...	26 0B	...	...	...	...	26 0B
Cinderella Cons. ...	...	...	...	...	...	...
City and Suburban ...	52 0B	...	45 6	46 0B	46 3B	46 0B
City Deeps	56 0	56 6B	...	55 0B	56 6	56 0
Cloverfield Mines ...	5 0B	5 0	4 9B	4 10B	...	4 10B
Cons. Langlaagtes ...	22 9	22 6	22 0B	22 3B	22 3B	22 3B
Cons. Main Reefs ...	19 6	19 3S	18 0B	18 0	18 0B	18 3
Coronation Freeholds	0 6B	0 6B	...	...	0 6B	...
Con. Investment ...	20 0B	...	...	...	...	...
Clydesdales	11 0B	11 0B	...	10 0B	...	...
Cons. Mine Selections	12 6B	...	12 6B	12 6B	12 6B	...
Crown Diamonds ...	...	...	...	...	...	4 0S
Crown Mines	...	137 6B	...	132 0B	...	130 0B
East Rand Cent. ...	10 0	9 6B	9 3B	9 0B	9 0S	9 0B
East Rand Coals ...	2 4	2 3B	2 3B	2 4B	2 3B	2 4B
East Rand Deeps ...	2 4B	2 4B	2 3B	...	...	2 1
East Rand Props. ...	59 0	58 9B	56 0B	57 0B	57 0B	56 0B
East Rand Deb. ...	£94½	£95	£92½	£92	£92	...
Eastern Gold Mines	1 6B	1 9B	1 6B	1 9B	1 10	1 9B
Frauk Smith Diam ...	8 6	8 0B	...	...	...	...
French Rands ...	...	1 0B	...	1 0B	...	1 0B
Govt. Areas... ...	24 3	24 0	24 0	23 6	23 3B	23 3
Glynn's Lydenburgs	24 0B	24 3B	24 6B	25 0B	...	24 0B
Ginsbergs	29 9B	29 9B	26 9B	26 9B	26 9B	27 0B
Glencairns	3 9B	3 9B	5 0S	3 9B	3 9S	4 0
Glencoe (Natal) Colls	6 0B	...	6 6S	6 6S	5 9B	5 9B
Jupiters	11 0	11 0	...	10 3B	...	...
Kaalfontein Diamonds	0 7S	0 7S	...	0 7S	...	...
Klerksdorp Props. ...	3 0B	3 0B	3 0B	3 0B	3 0B	3 0B
Knight Centrals ...	13 6	13 6	...	13 0B	13 0B	13 0B
Knights Deeps ...	42 6B	...	...	40 0B	...	37 9B
Luipaardsvlei Estates	7 6B	7 6B	7 6B	7 3B	7 6B	7 6B
Lace Props.	3 0B	3 0B	3 0B	3 0B	3 0B	3 0B
Lydenburg Gold Farms	2 3B	2 6S	...	2 6S	...	...
Main Reef Wests ...	26 3	25 0	24 0B	24 6	24 9	24 0B
Modder B's	57 0B	57 0B	57 0B	57 0B	58 0S	56 0B
Midas Deeps ...	0 6B	...	0 6S	0 6S	0 6B	...
Middelvlei Estates...	1 9B	1 5B	...	1 3B	1 3	1 3B
Modder Deeps ...	28 6B	27 6B	...	26 0B	26 6B	...
Meyer & Charltons...	...	...	...	...	...	...
New Eras	...	...	...	7 0B	...	...
New Kleinfonteins ...	28 0B	28 6B	27 6B	28 0B	29 0B	28 0S
New Rietfonteins ...	8 0B	8 0B	7 6B	...	9 0S	...
New Unifieds ...	19 6S	19 6S	18 0S	...	19 6S	17 0B
New Bokshurgs ...	...	2 0S	2 0S	1 9B	1 9B	2 0S
Nourse Mines ...	34 6B	35 0B	35 0B	35 0B	35 0B	35 0B
New Primrose ...	...	...	33 0B	35 0S	...	33 0B
Orange Diamonds ...	1 6	1 5B	1 4B	1 5B	1 5B	1 4B
Pigg's Peaks ...	11 6B	11 6B	11 6B	...	...	...
Premiers Deferred	...	...	...	...	190 0S	...
Pretoria Cement Co.	56 6S	56 6	51 6B	53 6	...	52 6B
Pretoria Estates ...	...	...	...	...	...	17 6S

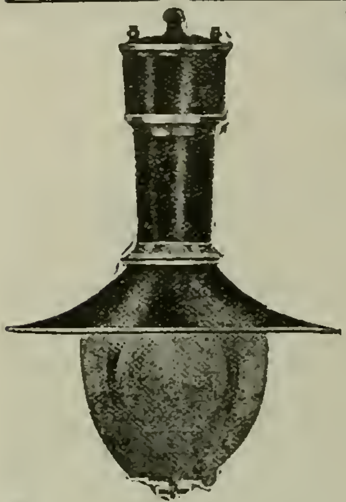
B Buyers. S Sellers.

	Friday, 28th	Sat., 29th.	Monday, 1st.	Tuesday, 2nd.	Wed., 3rd.	Thurs. 4th.
Paardekraal Estates	1 0S	...	...	...	...	0 6B
Princess	...	10 6	9 6B	9 6B	9 9B	9 9S
Rand Collieries ...	...	...	...	...	7 0S	...
Rand Nucleus ...	2 0B	2 9B	2 6B	2 6B	2 6B	2 7S
Randfontein Estates	27 9B	27 9B	27 6	27 0	26 6	26 0B
Randfontein Deeps...	3 9B	3 9B	3 9B	4 0B	4 0B	4 0B
Rooiberg Minerals ...	33 6B	34 0	32 0B	32 9	33 3	33 0B
Rand Klips	4 7	4 6B	4 6B	4 5	4 5	4 4
Ryan Nigels ...	3 9B	3 9B	3 9B	3 9B	3 9B	3 9B
Rood. Durban Deeps	26 0B	...	...	...	...	...
Robinson Deeps ...	...	...	45 3B	...	...	...
Simmer Deeps ...	3 3S	...	4 0S	4 0S	...	4 0S
South African Lands	4 3	4 3	4 2	4 0B	4 1B	4 1B
S. Randfontein Deeps	3 3B	3 3B	...	3 1B	3 3B	3 3B
Sub Nigels	5 0B	5 3	5 0B	5 3B	5 3B	5 0B
Springs Mines ...	16 0S	...	...	16 0S	...	16 0S
Trans. G.M. Estates	46 6B	47 0B	47 0B	47 0S	47 0B	...
Temple Tins	2 6B	...	3 0S	...	3 0S	...
Trans. Coal Trusts...	48 0S	47 0	45 0B	...	44 0B	...
Trans. Cons. Lands	...	...	...	27 6B	...	...
Tudors	...	...	...	1 0B	...	1 0B
Van Ryn Deeps ...	17 0	16 9B	16 9	16 6B	16 9B	16 9B
Village Deeps ...	41 0B	41 0B	39 0B	39 6	40 0S	39 0B
Vogel. Cons. Deeps...	1 1S	0 10B	1 1S	1 1S	1 1S	1 1S
Voorspoed Diamonds	5 0B	...	...	5 3B	10 0S	7 6B
Wit Townships ...	20 0B	20 0B	20 0B	20 0B	...	...
Witwatersrands ...	55 0B	...	...	50 0B	...	...
Wolhuters	19 6B	19 9	19 3B	19 3B	19 6B	19 9B
Witbank Collieries...	42 6S	42 6B	42 6B	42 6B	42 6B	42 6B
Wit. Deeps	49 6B	...	...	...	...	...
West Rand Est. ...	2 9B	...	...	...	2 9B	...
Zaaiplaats	44 6B	45 0	44 6B	44 6B	45 6	44 6B

B Buyers. S Sellers.

Important Mining Judgment in Supreme Court.

Last week judgment was given in the Transvaal Division of the Supreme Court in the case brought by the Federation Co., Ltd., against F. J. Bezuidenhout, B. C. Bezuidenhout, C. F. J. Meyer and Jan Eloff, which occupied the attention of the Judge President and Sir Justice William Smith for so many days in April last. The following counsel were engaged: Mr. C. F. Stallard, K.C., Mr. R. Gregorowski, Mr. J. van Hoytema and Mr. B. A. Tindall for the plaintiffs; and Mr. Ewald Esselen, K.C., Mr. Carl Jeppe, Mr. A. G. Wolmarans and Mr. G. van Pittius for the defendants. The plaintiffs claimed: (1) The payment of £4,650 from the defendants; (2) a declaration that Jan Eloff had no interest in a certain agreement dated 24th April, 1888; (3) a declaration that plaintiffs were entitled as assignees of W. B. Shurmer to the execution of notarial contracts over the farm Doornfontein, and to be allowed to exercise their rights there. Sir Justice William Smith, in the absence of the Judge President, delivered judgment at considerable length. After first reviewing the pleadings and the history of the case, he said that the four points to be considered, in his opinion, were:—1. Was Jan Eloff a partner in the contract of the 24th April, 1888. with Bezuidenhout, sen.? 2. Was the contract of 24th April, 1888, cancelled in October of the same year? 3. If not, what were the rights of Shurmer and his assignees thereunder? 4. What amount was due to Shurmer and his assignees under the contract for rents and licences? On the first point he said there was a conflict between the evidence of Shurmer and Eloff and the general probability was in favour of the latter's version of what occurred 24 years ago, although it was unsatisfactory in many respects. From a review of the probabilities it must be found that Jan Eloff was a partner in the agreement of the 24th April, 1888. On the second point it was again necessary to look at the probabilities. Shurmer's suggestion that there was a conspiracy between Eloff, Van Boeschoten and young Bezuidenhout was improbable for the reason that no such conspiracy could be successful without the inclusion of Muller, whom Shurmer described as an honest man. Van Boeschoten had no interest in the matter and should be believed, and the Court found that the agreement of the 24th April, 1888, was cancelled in October, 1888, by mutual consent. It was therfore unnecessary to consider the other two points, and in his opinion the action must be dismissed with costs. His Lordship then proceeded to read the judgment of the Judge President. The judgment of the Judge President was concurrent.



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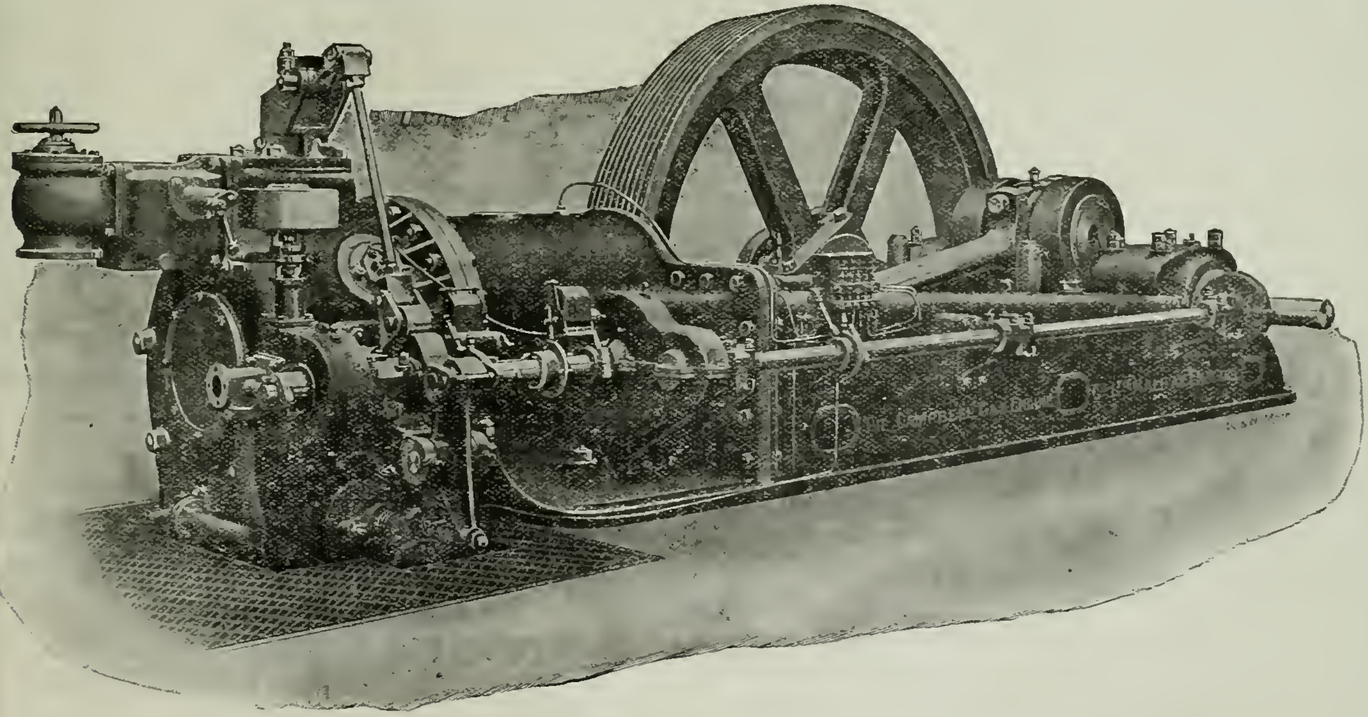
Engineering Notes and News.

A NEW DEPARTURE IN GAS ENGINE PRACTICE.

The accompanying illustration is of great interest to power users at the present time, as showing an entirely new departure in gas engine practice. The engine shown is a 420 B.H.P. twin-cylinder engine, which has recently been supplied to the Whim Well Copper Mines, the cylinders being 27in. diameter by 36in. stroke. The outstanding features of this engine is that it is fitted with a cross head and slipper guide for supporting the weight of the moving piston. The practice hitherto on all single-acting engines has been for the connecting rod to be coupled direct to the piston, the piston therefore requiring to support a good deal more than its own weight, a feature which, sooner or later, leads to trouble with the cylinder liner, especially in the case of larger engines. There are other special points worthy of note about this engine, among them being the bedplate, which, instead of being the old solid trunk type, is built up of two heavy section cast girders with a heavy cross piece supporting the slipper guide for the crosshead. Another feature that can be observed from the illustration is the mechanically operated starting valve. We believe that this is the first time any such starting apparatus has been fitted, and its advantages will be apparent to anyone who has had experience of the old method of hand-controlled starting. It will also be noticed that the crank shaft is of the built-up type, and that bevel gears are used for rotating the camshaft in place of the usual skew gears. To ensure greater immunity from electrical trouble, duplicate magnetos are attached to each cylinder. This engine is made by Messrs. The Campbell Gas Engine Co., Ltd., of Halifax, who have supplied through their agents, Messrs. Sturrock and Co., of Johannesburg, the large 360 B.H.P. units to the Rooiberg Tin Mines, which are now running so successfully in conjunction with their special "Open Hearth" type of producer plant, and many other installations in different parts of South Africa.



THE CLAIMS OF THE KONOMAX DRILL.

Under the New Era of Measured Air Consumption, an Appreciable Saving of Power Claimed.

The fourth Annual General Meeting of the Konomax Rock Drill Syndicate was held last week. Mr. W. S. Thomas was in the chair, and shareholders were represented to the number of 10,179 shares out of a total issued capital of 16,613 shares. In moving the adoption of the Directors' Report, Balance Sheet and Profit and Loss Account, the chairman said :—Gentlemen,—You have before you the Directors' Report, Balance Sheet and Profit and Loss Account, and these will not require much further explanation. The policy of the directors has been to keep the cost of running the Syndicate as low as possible, and as the manufacturing and selling rights of the Konomax drill are in the hands of Messrs. Fraser and Chalmers, Ltd., under a favourable contract, it is anticipated that the syndicate's working costs will not increase very materially in future years. By reference to the balance sheet you will see that we have not assessed the value of our contracts, and also that we are still carrying our Patent Rights Accounts at the actual cost of our existing patents. Our business has been so arranged that it will never be necessary for the Syndicate to have any appreciable amount of plant nor to carry stocks; therefore, our only assets of importance are our patents and contracts, and on the sale value of earning power of these depends the success of the Syndicate. Your directors have considered it a sound policy to wait until the Syndicate is on a really paying basis before placing a value upon these assets. You will be pleased to notice that for the first time our Balance Sheet shows a Royalty Account. This account is very small at present; but it is confidently hoped that in the next balance sheet it will make a good showing. There are some further amounts to be added in connection with drills already in the country, but at the date of closing our books we had no notification that these had been taken over. The syndicate has not progressed with the rapidity forecasted at our last annual meeting, and a full explanation of the reasons of the delay is due to you to-day. At the last annual meeting it was stated that one hundred and fifty of the 3½-in. drills and fifty or sixty of the 2½-in. drills were either in the country or on order, and that some of the larger size were actually at work. Many causes mitigated against a proper test being made to prove the value of the Konomax principle. When the first drills were supplied the Rand Mines Power Company were not in a position to fulfil the air power requirements of the various mines, and consequently in some instances the air pressure was very unsatisfactory. We were advised that a test made under the conditions then ruling would not be fair to the drill. None of the mines at this time were working with air meters, and no records of air consumption or drilling speeds were being kept. No mine was fully equipped with Konomax drills, as was the original intention, and, therefore, it was impossible to determine the efficiency of the machines. Such a state of affairs was naturally very unsatisfactory, and consequently your directors approached the Rand Mines, Limited, with a view to having them make a thorough and practical test in order to satisfy themselves in regard to the air consumption, drilling speed, and maintenance of the Konomax drill. Through the influence of Mr. J. H. Rider, consulting electrical and mechanical engineer of the Central Mining and Investment Corporation, Limited, and a Director of your syndicate, a practical test to determine these vital points was arranged. The test was arranged for a period of three months, and has only just been completed. Under a system inaugurated by Mr. W. Calder, resident engineer of the Village Main Reef Gold Mining Company, Limited, rock drills are maintained in such a way that the difference in efficiency between new and worn drills is a very small percentage. This high standard is maintained by returning each drill to the surface every three months, where it is reamered out, has a new piston fitted, and is in other ways made equal to a new drill. As the test of the Konomax drill was to be made under this system, it was unnecessary to extend it over a longer period than three months, the average efficiency of the drill during this period representing the true figures for the life of the drill. The report of the test shows the Konomax drill to have been eminently satisfactory in every particular. The air consumption was found to be exceedingly low, and the drilling speed exceedingly high, while the maintenance was no greater than that of any of the well-known types in use on these fields. I may safely say that all we have claimed for the drill has been fully justified, and that the Konomax machine is the most efficient piston drill at present on the market. It will be very satisfactory to you to learn that all of our troubles due to faulty material and design have been entirely overcome in the drill as now manufactured by Messrs. Holman Bros., Limited, under contract with Messrs. Fraser and Chalmers, Limited. The great difference in efficiency between new and worn drills, which was a striking feature in the report of the committee under whose auspices the test at the Meyer and Charlton mine was held four years ago, was shown to have been overcome by the system of maintenance at the Village Main Reef. After the completion of the Meyer and Charlton test, grave doubts were expressed that the design of the Konomax would tend towards a very great difference in efficiency between the new and worn drills, and would also tend to higher maintenance costs. I am pleased to be able to state that these fears have been proved by the recent test to be absolutely groundless. The only point which was objected to in connection with this test was the weight of the machine, and the makers have now given a guarantee that a reduction in weight of something over 40 lbs. can be made without impairing the durability of the drill. By this reduction in weight all the objections made against the drill disappear. One of our greatest difficulties in introducing this drill has been the attitude of the miners towards it. A very satisfactory feature of this test is the fact that before the test period was completed several of the miners expressed a decided preference of the Konomax drill. You can understand that it would be useless to give figures as to the performance of the Konomax drill during the test, unless such figures could be compared with the figures obtained in the same stopes by other machines. You are all aware that the rock differs in character and hardness in the various mines, and even in different parts of the same mine, and where a drilling speed of 2½ in. per minute might be excellent in one stope 3 in. per minute might be a poor record in some other stope. Therefore, unless comparisons can be made, figures will give you no idea of the remarkably good results attained in this test. No test has yet been conducted in respect to our 2½ in. drill, but your directors are endeavouring to arrange for a test of this size machine. A test of this drill should take the form of determining its relative efficiency as compared with hand hammer work. Your directors are of the opinion that this drill will be found capable of drilling many stopes at a lower cost than is now done by hand, and if such proves to be the case the drill will aid materially in the solution of the labour difficulties on the Reef. In the stope drill competition committee's report (1909), annexure "D," the underground manager of the competition, Mr. Johnson, reported that stope drills could be worked cheaper than hand labour in a large number of stopes. One of the difficulties in the way of the introduction of a greater number of stope drills was the lack of air power and the cost of installing extra compressors. The air-saving principle of the Konomax drill, coupled with the fact that more power is now available, solves this difficulty. Mr. Johnson's report was based on drills capable of drilling from 30 feet to 33 feet per shift, and on a finished hole of 15/16 in. diameter. Neither of the drills on which the report was based were using the air as economically as the Konomax. We have had reports to the effect that the 2½ in. Konomax is easily capable of drilling 45 feet per shift in rock which would be found quite as difficult as the average rock on the stopes where the competition was held. The size of steel usually adopted for use with small stope drills is 7/8 in. diameter. On account of the uncushioned blow delivered by the piston in the Konomax type, it was found necessary to use 1 in. diameter steel with the 2½ in. drill. It is obvious that with a larger finished hole a greater amount of rock per hole can be broken. I think you will agree with me that if the small stope drill can be shown to be cheaper than the use of hammer boys, a drill capable of performing possibly 40 per cent. more work, and having a greater breaking power per hole, will go a long way towards helping to solve the labour problem on those fields. Your directors are closely watching the performances of the hammer type of drill, and should this type eventually prove successful, Mr. Mause has a design which embraces the Konomax principle and which with but little experimental work could be put on the market. I think we all have confidence in Mr. Mause's ability in respect to rock drills of any type. As regards the business which the syndicate may reasonably expect in the near future, I will say that the efficiency of the drill having been so recently determined we are, of course, not in a position to say how the matter may

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be treated by the mining houses. However, the results have been so decisive that we do not see how this type of drill can possibly be neglected by those who have the industry under their control. The shareholders will of course be given any information not prejudicial at the time to the syndicate's business. The thanks of the syndicate are due to Messrs. The Rand Mines, Limited, for their kindness in going to the expense and trouble of making a test of the drill; also to the officials and staff of the Village Main Reef Gold Mining Company, Limited, and to our old friend Mr. Laschinger, for the able and thorough manner in which the test was conducted. I have to report, with regret, the resignation of Mr. F. Prior from the board and chairmanship of the syndicate. This step was necessitated owing to Mr. Prior taking up his residence in Europe. During Mr. Prior's term of office he fulfilled the duties most ably, and his resignation was accepted with great regret by the board. I think we are most fortunate in having a secretary who takes such a keen interest in the affairs of the syndicate, and I wish to express the thanks of the board for the able manner in which he has carried out the duties of his office during the past year. I have now much pleasure in moving the adoption of the directors' report, balance sheet, and profit and loss account. Messrs. J. H. Rider and H. Spengel, the retiring directors, were re-elected, and the syndicate's auditor, Mr. E. C. Lowe, was elected for the ensuing year. All the resolutions were carried unanimously.

Finance, Commerce, and Industries.

Reduction in Rates.

On June 24 the Government announced in the House of Assembly the general character of the promised reductions in rates (to amount in all to £750,000 per annum). Full details of the proposals have not yet been afforded, but in the official announcements examples are given of their probable effect in reducing rates on consignments to Johannesburg, viz:—Reductions per ton: South African wagon wood and rough imported timber, 14s. 2d.; planed imported timber (including ceiling and flooring boards), 24s. 2d.; doors and windows and frames thereof, paraffin oil, tram rails, and accessories for industrial purposes, 29s. 2d.; galvanised iron (packed), 27s. 6d.; imported cement, 14s. 2d.; agricultural implements and machinery, 35s. 10d.; windmills, 60s. 10d.; fencing materials, 5s. 5d.; tariff, Class 3, 14s. 2d.; tariff, Class 4, 14s. 2d.; tariff, Class 5, 12s. 6d.; tariff, Class 6, 5s. 10d.; tariff, Class 8, 15s. 5d.

* * * *

Rate Alterations.

In view of the losses which merchants who hold heavy stocks are liable to sustain if adequate time for disposal is not allowed, the Committee of the Johannesburg Chamber of Commerce has addressed the Minister of Railways, reminding him of the position and urging that at least two months' notice should be given of the alterations in port rates.

* * * *

Railway Construction Bill.

Upon the Bill being circulated, the Committee of the Johannesburg Chamber of Commerce telegraphed to the Minister the following resolution, viz.:—" This Chamber protests against the amendment of Clause 5 in the agreements with the Messina Company giving a preference to that company equivalent to the carriage of traffic for a distance of 244 miles without charge—(1) on the ground that a preference to any individual or company is inequitable; and (2) that the loss incurred in carrying traffic for nothing has to be borne by the industrial centres of the Transvaal." The Bill was, however, subsequently withdrawn, and the agreement did not come under Parliamentary discussion.

* * * *

British and Foreign Debts.

A very interesting speech was delivered by the Prime Minister in London on May 8th, in which he instituted a comparison between British and foreign debts, and gave to his hearers (who were principally composed of bankers and merchants) a satisfactory explanation of why Consols have fallen, coincident with a period of great prosperity, though, it must be added, of considerable labour unrest. This explanation has been given many times before, but, where figures are concerned, and particularly those of a big kind, their infiltration into the ordinary public mind is a process of such great difficulty that their repetition becomes needful. During the last 20 years, there has been an enormous increase in the area which is legally open to, and is taken advantage of, by trustees, for the investment of trust funds. Mr. Asquith estimates this alone at £2,000,000,000. Coupled with this, there is also that demand for higher interest which always prevails in a period of commercial activity. He might further have added that the rate of interest on Consols is lower. The " simple three per cents." are as dead, as representing a fact, as is the twopenny tube. The interest has been reduced from 3 per cent. to 2½ per cent., and was first so dealt with by the late Lord (then Mr.) Goschen, when Chancellor of the Exchequer. Mr. Asquith might also have mentioned that when statisticians (not always too scrupulous in dealing with figures when they have particular points to demonstrate or to gain) compare the price of British Consols with, for example, German Consols, they do not invariably state that the latter pay a higher rate of interest.

* * * *

Possibilities of Lucerne.

A company has been formed in the United States of America, under the name of the National Alfalfa Products Company, for the purpose of placing the manufactured products of alfalfa, or lucerne, on the market. The products are various, but among them will be a syrup which, according to analyses, contains 8·68 per cent. protein, 33·15 per cent. sugar, 1.30 per cent. fat, and 42·61 per cent. fibre. This means that lucerne sugar contains as much sugar as cane or maple sugar; and it is also stated to be of a very fine flavour. For the purpose of manufacturing sugar, the lucerne is cut, when young, every 12 days, so that it is possible to get about 12 cuttings in the season. This young lucerne is then cured by artificial heat, and is made into syrup at a cost of about one shilling per gallon. The value of lucerne to the grower, were he to sell it for the purpose of syrup-making, may be gained from an estimate of production and cost. According to the chemists, lucerne contains from 33 to 42 per cent. of sugar, which means that from a ton of lucerne at least 666 lbs. of sugar would be obtained, or a maximum of 840 lbs. As regards the commercial value of the discovery, it is stated that, with sugar at 2d. per lb., the lucerne would bring from £5 to £6 per ton. The cost of producing the sugar has been estimated at 30s. for the 666 lbs., and £2 10s. for the 840 lbs., so that lucerne would net about £3 per ton containing 33 per cent. sugar, and £4 10s. for the ton containing 42 per cent.

* * * *

Building Activity.

Nine municipalities in the Transvaal Province during the month of May approved plans having an estimated value of £142,436 as against £135,611 for the month of April, showing an increase of £6,825, and seven municipalities in the Cape Province approved plans having an estimated value of £10,767. The Durban Municipality passed plans having an estimated value of £29,102 10s. The following are the detailed estimated values of buildings, the plans of which have been approved by the undermentioned Municipal Councils during the month of May, 1912:—Johannesburg, £91,115; Boksburg, £2,630; Benoni, £16,080; Germiston, £8,552; Krugersdorp, £8,425; Potchefstroom, £1,507; Pretoria, £12,647; Roodepoort, £1,200; Springs, £280; Durban, £29,102; Queenstown, £962; Oudtshoorn, £420; Steytlerville, £300; Stellenbosch, £1,150; Wynberg, £620; Kimberley, £2,315; Mossel Bay, £5,000; total, £182,305. Tenders accepted by Government for public buildings during the month, and not included in the above amount, £47,230.

Postal, Telegraph and Telephone Business.

The following is a comparison of the business of the Post Office in 1910 and 1911:—

Description.	1910.	1911.
Posts :—		
Revenue	£949,113	£951,032
Expenditure	£897,095	£924,640
Offices open	2,466	2,587
Posting receptacles (excluding those at Post Offices)	752	856
Private post bags in use	2,241	2,543
Main posts running	328	330
Cost of mail conveyance (exclusive of ocean mail service)	£197,787	£204,606
Articles of mail matter posted	178,774,770	180,555,976
Registered packets dealt with	1,019,512	1,689,541
Parcels posted	1,327,444	1,672,202
Articles despatched to places outside the Union	14,052,812	14,802,856
Articles dealt with in Returned Letter Office	1,768,460	1,784,979
Money Orders issued	484,207	484,424
Money Orders paid	365,959	370,255
Postal Orders issued	2,693,712	2,919,002
Postal Orders paid	2,020,730	2,194,950
Postal Drafts issued	7,764	10,369
Savings Bank :—		
Accounts open	218,617	233,607
Amount standing to credit of depositors :—		
In ordinary accounts	£5.066,388	£5,390,472
In certificates	£851,300	£962,100
Amount deposited during the year (including interest)	£3.708.918	£3,926.711
Amount withdrawn	£2,983,996	£3,602,627
Telegraphs and Telephones :—		
Revenue	£460.729	£512.883
Expenditure	£521.269	£528.981
Capital Account : Telegraphs	£1.077.189	£1,091,381
Telephones	£893.239	£1,213.260
Miles of telegraph line	12.516	14,920
Telegrams dealt with	4,831,924	5,118,676
Number of Telephone Exchanges	131	179
,, Public Call Offices	497	674
,, Exchange Lines	10,483	12,771
,, Telephones in use	15,378	18,672
,, Telephone Calls	24,000,000	34,500,000
General :—		
Total amount of money dealt with	£19,500,000	£20,500.000
Revenue collected for other Departments	£646,454	£752,008
Number of persons employed (excluding mail cart drivers, native runners, and others)	7,545	7,649

* * * *

Arms Factory for Maritzburg.

It is the intention of the Union Government to build a small arms factory near the huts at Fort Napier, Maritzburg. Inspection was recently made of the site, and the report was favourable, not the least of the recommendation being the proximity of the spot to the railway line. Rifles, revolvers, and cartridge cases will be manufactured. It is presumed that arrangements will be made with Kynoch's or some similar company with regard to the supply of explosives. The underlying idea is that Maritzburg will be compensated for having lost the military college, on the establishment of which in Natal many hopes were set. It is hardly necessary to add that the Government enterprise will provide labour for a large number of hands, and will naturally increase the circulation, in Maritzburg, of the necessary and welcome silver and gold.

* * * *

British East Africa.

The British East Africa Protectorate has reached an important turning point in its history. At the close of the current financial year it will enter the ranks of the self-supporting dependencies of the British Crown. In the past it has had its full share of those Imperial grants-in-aid which, properly regarded, are a necessary form of capital expenditure on the Empire's new estates. Apart from the annual sums voted by Parliament, between five and six millions of pounds sterling have been sunk in the construction of the Uganda Railway. The policy involved in these payments has been abundantly justified by the growing prosperity of British East Africa. Its attainment to a position of financial independence has come with rather a rush at the last. Including the grant for the current year, the last five contributions to the revenue of the Protectorate from the Imperial Exchequer have been: 1908-09, £138,000; 1909-10, £133,500; 1910-11, £130,000; 1911-12, £190,000; 1912-13, £23.500. The grant last year (1911-12) included a sum of £75,000 required in part provision for additions to rolling stock, etc., on the Uganda Railway, in terms of an agreement entered into by the Protectorate Government for the working of the soda deposits in Lake Magadi.

* * * *

The Wattle Industry.

The wattle industry is one of the most important of the industries connected with the soil of South Africa, according to the *Agricultural News*. It profitably utilises about 200,000 acres, and the output is in the vicinity of 50,000 tons, and likely to increase to 100,000 tons per annum before very long. Markets must, therefore, be found for this enormous quantity, and if an experienced grower, officially representing the wattle industry, were to go round the leading farmers in the United Kingdom alone, he would obtain some very useful information concerning the requirements of buyers. A fair proportion of the tanners in the United Kingdom are reluctant to rely upon wattle bark, fearing that the supply might fail. If they were given an assurance of regular quantities it would help to put tho industry on a more stable basis. France, again, would take large quantities if arrangements could be made to ship in French vessels, while America is a future consumer. Hitherto prices have ruled rather too high for the American dealer. In America tanning material is chiefly extracted from hemlock, the supply of which is reported to be failing, consequently the American buyer is likely to look more favourably upon our wattle bark for his supplies in the not far distant future. The position has become to some extent serious, and it is advisable that action be taken without delay to ameliorate the present condition of the market and improve the outlook. We may add that in a few years the Pilgrims Rest district of the Transvaal will be a largo producer.

* * * *

Building of Post Offices.

Contracts have been entered into by the Post Office for the erection of new offices at Barberton, Cradock, Marquard, Paarl, Prince Albert. Southernwood. Theunissen, Vrede and Willowmore, and some of the buildings are nearing completion. It is hoped that during the ensuing financial year new Post Offices will be built at Carolina and Turffontein and new Telephone Exchange premises at Boksburg and Krugersdorp. It is also proposed to effect extensive additions to the offices at Benoni Claremont, Grahamstown, Queenstown and Worcester. Negotiations are proceeding with the Railway Administration in regard to new offices at Bellville, Germiston Station, Hermon Retreat, Ventersburg Road and Welverdiend. The growth of postal, telegraph and telephone business at Bloemfontein during recent years calls for increased accommodation. The matter of suitably meeting the requirements is receiving careful consideration. The total number of Offices and stores depots in Government buildings on the 31st December 1911, was 255, and the number in rented buildings was also 255, as against 250 and 240 respectively on the 31st December, 1910. At all other places the cost of accommodation is included in the allowances paid to the Postmaster or free accommodation forms a condition of the opening of the office.

SUBSCRIPTION RATES.

Oversea	£2	0	0	per annum.
South Africa (by post)	£1	10	0	per annum.
Local Delivery (town only) ...	£1	6	0	per annum.

Half-yearly and Quarterly pro rata.

DYNAMITE IN FARMING.

A New Channel of Usefulness for an Important South African Product.

Under the ægis of the various explosive manufacturers and their agents throughout South Africa, dynamite is developing into the farmer's most useful tool. Its most extensive use is in connection with what is called subsoil ploughing, meaning the breaking up of the underlying stratum so that the moisture can force its way into the soil to dissolve the elements of nutrition upon which plant-life flourishes. Ordinary ploughing only treats a comparatively thin layer near the surface, and as this is turned over and over in successive years it is not long before the ground begins to show signs of exhaustion unless stimulated by the aid of fertilisers, and the yield in the crop declines. The subsoil is not touched in the slightest, and being packed hard and firm, it acts practically as a seal. The roots of the crops cannot descend into it, and consequently straggle right and left near the surface, fighting keenly with one another for food. The most economical method of treating the subsoil demanded searching investigation. On a market-garden, trenching may be resorted to in order to achieve the desired end, but on a farm of several thousand acres such operations are impracticable. Then it was thought that by charging the ground with dynamite cartridges, spaced at certain intervals apart, the whole of the subsoil might be shattered and loosened to a depth of several feet. The experiment was tried, and the results were astonishing. To-day the treatment of the subsoil by dynamite is advocated on every hand by the foremost agricultural authorities, at experimental stations, by railway companies, and by many others interested in the development of the land. Certainly the system is inexpensive and simple. Moreover, it is rendered as safe as science can make a dangerous explosive. A special brand of dynamite suited to the requirements has been evolved; and, with due attention to the elaborate instructions issued as to handling and using it, no fear whatever need be entertained of the tool turning upon the user so long as ordinary intelligence is displayed. A hole is bored into the ground to the requisite depth by means of an auger; the cartridge, with a long length of fuse attached, is slipped in; and the charge is tamped home with a wooden stick, leaving a short length of fuse projecting above the ground. When a large field is being subjected to the treatment the cartridges are planted in continuous rows at such a distance apart that the forces of two adjacent cartridges just overlap, so that the field is treated completely. The fuses are then lighted, and the explosions lift large quantities of earth a few feet into the air, the subsoil for a depth of eight feet or so being shattered and loosened. The farmer then runs his plough over the surface in the usual manner, and completes the cycle of his agricultural operations. Another ingenious application is in the blasting of holes for the planting of fruit and other trees. A spade-dug hole merely loosens the earth within the area of the excavation. The surrounding wall is hard and firm, so that the roots of the tree have great difficulty in forcing their way through the ground, and growth accordingly is stunted for a long time. By blasting, on the other hand, not only is an excellent hole made, but the surrounding earth is disintegrated, so that when the tree is set the roots can push their way into the ground without the slightest effort, and growth starts immediately. It has been proved conclusively that fruit-trees planted in blasted holes grow three times as rapidly as those set in spade-dug holes; they come into bearing sooner, and consequently the orchard comes into profitable yield in a shorter time. Throughout North America farming by dynamite has become well established, and certainly the successes attained in the bumper crops offer conclusive testimony to the value of the method. Demonstrations recently given by Messrs. Reunert and Lenz, on account of the Cape Explosive Works, were entirely satisfactory.

Mr. Robert Greenlees, who is employed at the Modderfontein factory of the British South African Explosives Company, Ltd., has been informed that he has been awarded the King's Medal for bravery. In March of last year, Mr. Greenlees, whilst his clothes were alight as the result of ignition by explosive material, went to the rescue of another victim of the accident, who, he thought, was in a worse plight than himself. The deed evoked the admiration of all Greenlees' colleagues at Modderfontein, and the intimation that Royal recognition has been graciously given has rekindled that feeling at the factory. Arrangements for the presentation will be made later on.

Irrigation Pumping with Electricity.

An interesting example of the use of electrical energy for irrigation pumping is found in New Mexico. This scheme embraces a total present area of 10,000 acres, which overlies a water-bearing formation at comparatively shallow depths, ranging from about 20ft. to 50ft. There are 69 motor-driven pumping plants scattered over the project, each pumping from an individual well. The delivery head varies from 15ft. to 35ft., and the well capacities have been found to range from 900 gallons to 1,700 gallons per minute. The wells were drilled to receive a 14-in. galvanised-iron casing. Through water-bearing strata the casings were perforated with slots 1in. in length, ⅛in. in width, spaced about ⅜in. between transverse centres and 1¾in. between longitudinal centres. In all installations the discharge pipe is 10in. in diameter. Each pump is of the single-stage centrifugal type, direct-connected to a 550-volt, 60-cycle, three-phase induction motor, and the combined unit is installed in a well-pit of such depth that the water gradient is within lifting distance. The energy for operating these installations is developed and distributed from a private plant situated in the city of Portales. This plant is equipped with three 500-h.p. producer-gas sets for operation with bituminous coal. There are two direct-connected generating units, each consisting of a 750-h.p. horizontal gas engine and a 600-volt, 60-cycle, three-phase generator. The manufacturer guaranteed the producers and engines to deliver a brake horse-power-hour on 1·2 lb. of coal, having at least 12,500 B.Th.U. per lb. In actual operation the manufacturer's guarantee has been exceeded. At full load, with fuel costing rather over £1 per ton at the plant, the cost of energy, including fuel, labour, oil and waste, is less than 0·5d. per kilowatt-hour. The distribution system comprises 38·4 miles of 11,000-volt, three-phase primary circuits and 35·4 miles of 550-volt, three-phase secondary circuits. The 69 individual pumping plants reached by these circuits have an aggregate connected load of 1,200 h.p. There are 17 step-down transformers, with a total rating of 540 kw. The entire system is owned by the farmers, who have taken up holdings on the project.

Contracts Open.

The Municipal Council of Johannesburg invites tenders for the supply of sanitary pails and lids (August 2nd), licence plates and badges (2nd August).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of 904.625 hardwood sleepers or (alternatively) creosoted Baltic sleepers (July 23).

The Chairman of the Union Tender Board, Box 371, Pretoria, invites tenders for the supply, delivery, and fixing in position where necessary, certain show cases, furniture and fittings, to the Public Museum at Bloemfontein (July 31).

The Corporation of Pietermaritzburg invites tenders for the supply of one steam turbine with tandem generators, switchboard, and condensing plant (July 29).

The Municipality of Ladismith, Cape Province, invites tenders for the supply of six inch steel pipes and other incidentals thereto for the proposed water scheme (July 15).

Johannesburg Motor Garages and Suppliers of Motor Cars, Accessories, etc.

Dunlop Repair Shop

SEND YOUR TYRES FOR REPAIR OR RETREADING

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DUNLOP GROOVED TREADS (manufactured in our English Factory) **Fitted to any make of cover.**

Burst Covers and Tubes properly repaired.

Call and inspect samples of our work.

Dunlop Repair Works,

83, BREE ST.,
P.O. Box 6370. JOHANNESBURG.
'Phone 831.

Notice to Motorists.

It has come to our notice that certain unauthorised persons are making use of the empty tins in which

WAKEFIELD "CASTROL" BRAND

of Motor Car Oil is originally sold, and supplying an inferior quality oil therein.

This is, therefore, to warn consumers of our oils against imitations.

To ensure getting the genuine quality please see that our seal, on all tins, has not been tampered with.

Johannesburg, this 7th day of June, 1912.

C. C. WAKEFIELD & CO.,

3, 4, 5, Howard Buildings,
corner Main and Loveday Streets,
Phone 2432. Johannesburg. Box 4452.

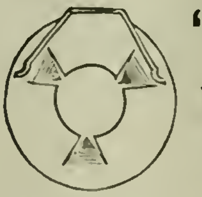
JUST ARRIVED—1912 MODELS

PHŒNIX AND VULCAN CARS

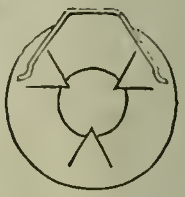
Trial Runs Arranged. Full Particulars from

REED'S GARAGE

GOVERNMENT SQUARE, JOHANNESBURG.
Phone 1434. P.O. Box 2720.



'FASTNUT' WASHERS.



£1000 will be paid to anyone showing us a Nut that can get loose through vibration where the "FASTNUT" Washer is properly applied

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First and Fastest
"Hill Climbs"
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HILLBROW,
JOHANNESBURG.

Phone 2870.
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Automobile Notes.

The Price of Speed.

" Speed and Its Price " is the title of an interesting article appearing in one of the Home monthly magazines to hand, which features some carefully-compiled statistical tables showing the percentage of accidents for which mechanically-propelled vehicles, and those of a horse-drawn nature, are respectively responsible, and from which one must conclude that the motor car is far from being the Juggernaut of the streets that it is familiarly represented to be, and proves, in addition, that this vehicle is the most amenable to traffic regulations. This, it may be remarked, is particularly true in the case of the privately-owned motor; and considering that the great bulk of accidents in regard to mechanical traction, which, it is of interest to remark, taking the United Kingdom as a whole, is only one victim in every ten thousand of the inhabitants, are attributed to motor 'busses and tramcars, the number of accidents for which private locomotion is responsible are distinctly insignificant. It is an age of speed—dubbed by many writers as the horseless age. Motor vehicles, despite all attempts to enforce speed regulations, daily more and more incline to rapidity of movement, which after all, on analysis, must be admitted as essential, otherwise the traffic congestion of a modern city would be intensified to an alarming extent, and in consequence a larger percentage of accidents would have to be recorded. The motor, without doubt, has revolutionised modern street traffic, but were the pedestrian, who shares the brunt of the accidents which occur, to adapt himself to the changed conditions, and, in short, exercise an alertness in keeping with the times, the much-overdrawn bogey in respect to the death-dealing characteristics of the modern motor car would soon disappear.

The Reyersbach Trophy.

The competition for the Reyersbach trophy, held on the 30th ult., was keenly contested, and were it not for the lamentable accident, which cut short the career of one of the most promising motorists of the younger school, the event would have been classed as perhaps the most successful as yet organised by the Transvaal Automobile Club. As it was, the distressing accident in which Mr. W. G. Parsons lost his life, and the general secretary of the club, Mr. Walter Wilkinson, received injuries which will incapacitate him from duty for some time to come, cast a gloom over competitors, and the large number of friends and spectators gathered to witness the racing. To the bereaved relatives of the late Mr. Parsons much sympathy is extended, and the esteem in which this young engineer and sportsman was held by the motorist community of Johannesburg was evident by the eloquent tribute paid in the concourse of cars which followed his remains to their interment. Mr. Wilkinson, readers will be pleased to learn, has been successfully operated upon, and is improving satisfactorily. He desires to express thanks for the many kind enquiries made on his behalf. The official results of the " Reyersbach " were declared in favour of the Talbot cars, which were successful in obtaining first, second and third places in the event. The well-known South African representative of this car, Mr. D. H. Saker, secures possession of the cup presented, having competed for and won it three times in succession. Much interest centred in the Sunbeam's chances in this speed contest, having regard to the reputation of the machine on British and other tracks. It, however, made the fastest time for any one lap—the course being one of five laps of approximately 20 miles each. The results in the competition arranged for American cars, and held in conjunction with the " Reyersbach," are as follows: 1, Mr. J. B. Ritchie's 16 h.p. " Flanders "; 2, Mr. B. J. Penny's 20 h.p. " Ford "; 3, Mr. J. O. Bartle's 23·6 h.p. " Overland." This special class for American cars is an innovation much appreciated, and was considered necessary, recognising the high horse power developed by these machines in comparison to their respective weight. Heretofore a considerable handicap attached to American competitors in former contests, which the separate formula, however, has removed to the satisfaction of all concerned.

Economy and the Car.

The favour which the motor, as opposed to the horse, is gaining with the Railway Administration, municipal bodies and commercial firms in South Africa has undoubtedly for its chief factor economy, and it appears that it is only a

Another PROOF of the Durability and Reliability of
"CONTINENTALS."

THE FRENCH GRAND PRIX.

The greatest event of the year for Motorists.

The French Grand Prix over the Dieppe Circuit, a distance of 960 miles, was won by Boillot on a " Peugeot " shod with

CONTINENTAL TYRES

ADVICE TO MOTORISTS.

South African motoring conditions call for a simplified—quicker, easier and better—method of puncture repair.

PARSONS RAPID REPAIR KIT

Cuts out all the mess, bother and wasted time of the old patch-and-solution way. A rubber-covered metal plug is inserted into the hole. When compressed, this plug makes an absolutely air-tight joint—permanently mending the puncture in one minute.

15/- Complete kit consists of piercing tool, stretcher, closing pliers, and 12 plugs, weighs 1 lb., measures 7 in. x 4 in. (fits the pocket) 15/-

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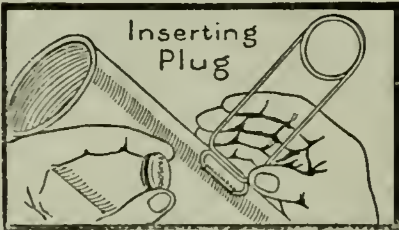
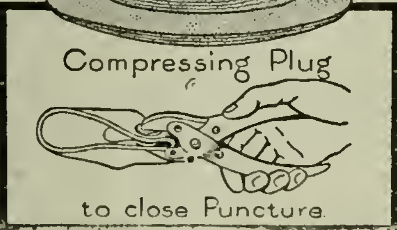
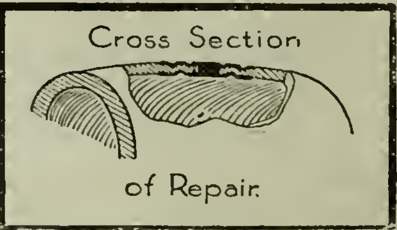
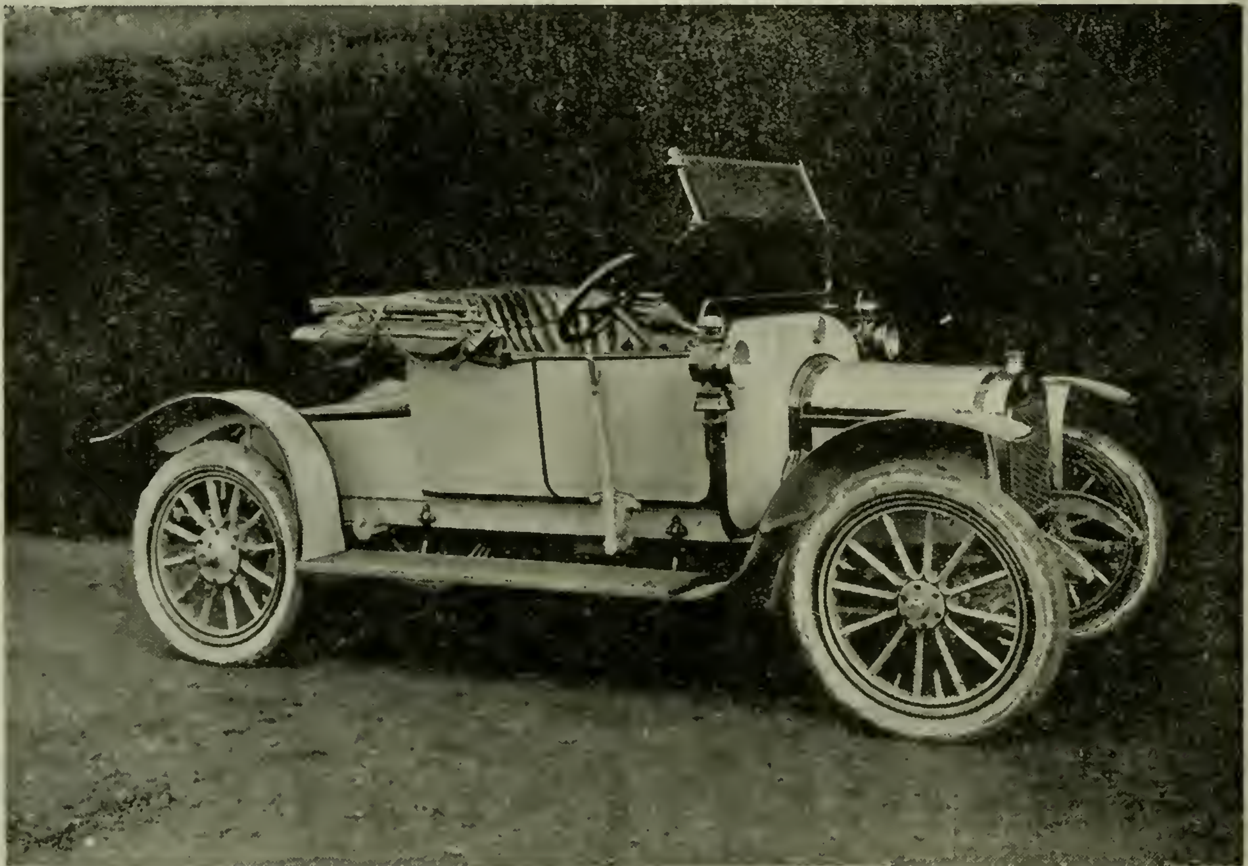






10/14 AUSTIN-TWO SEATER.

AS POWERFUL AS MANY SO-CALLED 15 H.P. CARS.



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question of time until every concern of importance will adopt the system of motor delivery. The problem, however, of efficient operation is one which must be solved before any claim to real success will be established by the general adoption of motor traction, and any efficiency worth the name can only be decided by a definite saving in expense. Recognising this to be the case, the selection of the type of tractor best suited to the peculiar conditions of the country of operation may be said to be the first step towards the desired economy. Those for use in South Africa, for example, should be specially constructed to withstand the severe strains which the inequalities of road surface involve, and in such vehicles, therefore, the springing and clearance in particular should be made a special feature of. A properly-equipped garage and machine shop should be erected, provided the firm wisely decides to supervise its own motors in preference to deputing this work to a local garage, where an expert mechanic, whose services under the circumstances are indispensable, can be placed in charge. This appointment will be one of primary importance in the case of concerns who maintain the services of several motor wagons in operation. Where only one can be afforded the services of an all-round driver-mechanic may be secured, but it will be apparent that this person cannot be expected to devote the attention considered necessary. By way of illustration, it will invariably follow that deliveries on the one-truck system will extend to the late hours of the evening, and naturally rest at the end of a prolonged day's work is of vital importance to the driver, who, it is apparent, cannot reasonably devote the time to a thorough inspection every night, and effect the many needed adjustments in the way of tightening up nuts here and there, which rough roads so frequently work loose. Tanks will also require filling and lubricators and grease cups, to perform their functions satisfactorily, require replenishing, and many frictional parts in addition exact careful attention. Include in the multifarious duties, washing and polishing (work which may be relegated to natives), and a casual consideration must impress one of the impossibility of satisfaction on the one-man principle. In many large firms, the driver, on the other hand, is not permitted to make any adjustments, but to insure against undue delays from mechanical troubles, it is obvious that a rudimentary knowledge of mechanics is a recomendation in regard to the driver. Further, those in charge of the despatch of goods are responsible that no overloading occurs; although many standard trucks will permit of 100 per cent. overload without failing, the practice nevertheless is to be condemned, and the economic tonange for which they are built should always be respected. Much could be written in regard to the speed permissible for motor wagons, but this will in time be regulated by governors which are absolutely positive in action. Unnecessary speed entails extra expense, and should not be countenanced unless the circumstances of a particular case, such as the urgent dispatch of goods, justify it. The practice, on the whole, is wrong, apart from the violation of the by-law which it entails.

Racing and Accidents.

T.A.C. racing has been particularly free in past years from bad accidents, considering the risks attached to each racing season, in the absence of a special racing track. Some time ago the formation of a track was entertained, and several suggestions were made, in point of districts where ground conditons favour such a scheme, within easy distance of Johannesburg. Perhaps the regrettable accident in connection with the recent competition may once more carry home the importance of a prepared track for all events in which speed is the determining factor. An accident of the nature referred to, which, by the way, has been attributed to the bursting of a tyre, is by no means an uncommon source of risk, but it is only under exceptional circumstances, such as racing at high speed, that serious results attend. Its immediate effect, however, is to deflect the steering, and no difficulty in the ordinary way need be experienced in retaining control, but when travelling at a high speed it is almost impossible to hold the road. Evidently the car under discussion swerved violently, and probably something in the nature of a rebound violently threw the occupants, in two instances clear some distance, one gentleman unfortunately being pinned with deplorable results beneath the wreckage. The main point at issue, however, is the risk which competitors encounter in these contests, owing to the absence of a properly-prepared track, of which more will probably be heard in the near future. A move in this direction may obviate any interference which the Government may contemplate in these racing contests.

New Patents.

283. William Cullen, Thomas Donaldson, Gilbert Frederick Ayers and the British S.A. Explosives Co., Ltd.—Improvements in fuse lighters.
284. William Cullen, Thomas Donaldson, Gilbert Frederick Ayers and The British S.A. Explosives Co., Ltd.—Improvements in lighters for fuses.
285. Boris Chapiro.—Improved process for rendering fabrics and paper solid and impervious.
286. Arthur Percy Francis.—Combination of whistle and dagger with spring attachment and sheath to be carried by women as protection against attack.
287. Seymour Wentworth Bonsall.—Improvements in rotary drying apparatus.
288. Ernest Graham Godfree.—An improved automatic toll recorder for telephone systems.
289. James Smith and Sydney Frank Wilson.—An improved game.
290. Johannes Hendrik Erasmus.—Method for automatically producing power.
291. Sydney Edward Thacker Ewing.—Control of gear for operating switches and resistance of electric winding or hauling engines or the like.
292. Bernard James Egan.—An improved resilient suspension device for vehicle bodies, cycle saddles, and the like.
293. George Frederick Taylor and James Wilshir.—Improvements in and relating to water sprays.
294. Frances Lovas.—An improved device applicable for use as a boiler or cooking utensil, and for other similar purposes.
295. Gugliemlo Marconi and Marconi's Wireless Telegraph Company, Limited.—Improvements in installations for wireless telegraphy.
296. Heinrich Brunsurig.—Process for the detonation of explosive bodies.
297. Ernest Moss.—Improvements in and relating to postal franking machines.
298. Herman Clarke and James Alexander Campbell.—Improvements relating to apparatus for the destructive distillation of coal.
299. Dr. Fritz Rothe.—Process for the production of pure nitrite from nitrous gases containing air or oxygen.
300. Sighbert Bloch.—Improvements in regenerating burnt out electric filament lamps.
301. Albert Verley.—Process for the manufacture of precious metals, namely, gold, silver and platinum.
302. John George Leyner.—Fluid controlled drill steel forming and drill bit sharpening machine.
303. John George Leyner.—Rock drilling engine.
304. William George.—Improvements in and relating to metal bars for use in ferro-concrete construction.
305. Albert Mitrani.—Improvements in and relating to metal bars for use in ferro-concrete construction.
306. Max Adolf Bleichert and Max Paul Bleichert.—Improvements in and relating to carriages for ropeways and the like.
307. Elliott Quincy Adams.—Improvements in incandescent lamps.
308. Thomas Churchman Darby.—Improvements in or connected with implements for cultivating or ploughing land.
309. Robert Harrison and George Kohler.—A new and improved method or arrangement for opening, shutting, and fastening windows without the use of sash weights and axle pulleys or window fasteners (to be known as H and K simplex window gear).
310. William James Melhuish and Henry Mackeson.—An improvement in the manufacture of aerated waters, non-alcoholic beverages and in fermented and malt liquors and in the bottling of natural waters.

Prospectuses.

3929. Economic Investors Trust Co., Ltd., Johannesburg.

Change of Name.

3631. Moorhouse, Ltd., to Harcourt and Co., Ltd., Johannesburg.

The Progress of the I.E.E.

The Institution of Electrical Engineers reports an increase in its prosperity. During recent years the number of applications for membership has been declining, the average annual growth for the last five years being only 105: but the report of the Council, which was presented at the annual general meeting last month, shows the large increase of 304 for the past year. Possibly this advance may be due to the broader policy now being pursued by the Council; or perhaps the new building is proving a greater source of attraction than some members were disposed to think probable when it was acquired. Additional support should also result from the probable extension of the Institution's sphere of operations, as mentioned by the President at last month's meeting. Negotiations are at present in progress for the formation of local sections in Johannesburg and in Canada. South Africa is rapidly becoming the scene of great electrical activity, so that a new local section here in the heart of the mining district is anticipated. It is hoped that the existing South African Institute of Electrical Engineers will agree to form the nucleus of the new section.

Tenders Accepted.

The following tenders were accepted by the Union Government for public buildings during the month of May, amounting to £17,230 13s. 1d. :—Erection of school for 64 pupils, Modderbult No. 328, Heidelberg, Mr. A. E. Ordbrown, Box 2895. Johannesburg; additions to school building, Bezuidenhout Valley, Witwatersrand, Messrs. Harper Bros., Box 6393, Johannesburg; supply and erection of superstructure Batje Spruit Bridge, N'qutor Division, Natal, Messrs. Mowat and Sons. c/o President Hotel, Vryheid; erection of bridge over Groote River, Steytlerville. Cape Province, Messrs. Moorshead and Harwin, Box 359, Port Elizabeth; erection of bridge over Tyumie River, Victoria East Division. Cape Province, Messrs. Moorshead and Harwin, Box 359. Port Elizabeth; erection of bridge over Groote Vet River. Winburg. Orange Free State, Messrs. Wm. Bain and Co., Box 2721, Johannesburg; erection of school, Nottingham Road, Natal, Mr. Geo. Grundy, Box 2682, Johannesburg; alterations and repairs to premises No. 390 West Street, Durban. Mr. F. G. Harper, Turners Avenue. Durban; erection of bridge over Upper Ingafane River, Newcastle Division, Natal, Messrs. Peattie and Stannard, 180 Church Street. Pietermaritzburg; reconstruction of bridge over Umhlatuzi River, Eshowe Division. Natal, the Neuchatel Asphalte Co., Main Street. Johannesburg; erection of bridge over the Magot River, Vryheid, Natal, Mr. Geo. Grundy, Box 2682, Johannesburg; erection of bridge over the Umhlonzana Spruit, Newcastle, Natal, Mr. J. Brand, Mosheshsford, Barkly East, Cape Province; erection of bridge over the Umlalazi River. Eshowe, Natal. Mr. C. Fraser, Eshowe, Natal; erection of bridge over the Little Brak River (Sprigg Bridge), Mossel Bay, Cape Province, Mr. James Littlejohn, Stegning Street, Woodstock; erection of bridge over the Rhenoster River, Vredefort, Orange Free State, Messrs. Medem and Lehman, Box 167, Kroonstad; removal of South African College Buildings at Heidelberg and re-erection as a school, Elandsfontein No. 281, Heidelberg, Mr. J. S. Smuts, Box 15, Heidelberg; repairs and alterations to roof at Addington Hospital, Durban, Mr. H. Brown, Box 3, Lower Umkomaas; additions to school buildings, Goedgenoeg No. 593, Klerksdorp, Messrs. Bracher and Andrew, Box 182, Potchefstroom; renovations and repairs to Chronic Sick Hospital, Grahamstown, Mr. J. McAlister, Grahamstown: alterations to Custom-house, Point, Durban, J. Edmonds and Co.

Increases of Capital.

880. The Artesian Mineral Waters, Ltd., Johannesburg; from £600 to £900.

2937. The Farmers' Agency (Co-operative), Ltd., Johannesburg; from £2,000 to £2,300.

3799. Sands, Ltd., Johannesburg: £11,000 to £12.500.

3906. Eastern Whaling Co., Ltd., Johannesburg; from £45,000 to £60,000.

1623. Geduld Proprietary Mines, Ltd., Johannesburg; from £750,000 to £875,000.

3880. The Premier Whaling Co., Ltd., Johannesburg; from £45,000 to £60,000.

2304. The New Rand, Ltd., Johannesburg; from £134,349 to £135,802.

3773. The East Coast Timber Co., Ltd., Johannesburg; from £1,200 to £1,500.

Our Twenty-First Anniversary Number.

THE LAST WORD ON RAND MINING.

To commemorate the twenty-first anniversary of the founding of this journal, a special number, distinct from the ordinary weekly issue, will be issued this month. Fittingly to mark the occasion, the number will contain a comprehensive and concise account of the past history, achievements and present position of every gold mine on the Rand, illustrated and brought down to the latest possible date. It will review the industry generally as well as in its several technical aspects, and will include articles by experts on the chemical, mining and metallurgical progress and problems of the fields. A feature will be made of the personal side of the industry, and a section will be devoted to its technical and administrative leaders, enriched with portraits and other illustrations. Engineering on the Rand in all its phases, electricity, steam and air power will be treated, and the growth and progress of electric power supply will be exhaustively discussed. The gold mines of the outside districts and the tin, copper and coal industries of those districts will be dealt with thoroughly and at first hand. The great diamond industry of South Africa will have a section to itself, and here, as in the treatment of the base metal industries, the letterpress will be embellished with many striking and original illustrations. Mining in the Cape, Natal and Orange Free State Provinces will also be reviewed and the undoubtedly great mineral potentialities of those, as yet undeveloped, areas will be graphically set forth. German South-West Africa will find a place in the issue and a first-hand account of the diamonds, the copper and the tin mines of that promising field will be included. Moreover, the banks and other great financial institutions, the railways and harbours of the sub-continent will be adequately dealt with, and the whole problem of transportation as it affects the inland industrial centres will be reviewed. In this connection Capetown, Port Elizabeth, Durban, East London, Delagoa Bay and Beira will be separately and fully treated and their claims examined. Apart from mining, there will be a considerable section devoted to a description of the several subsidiary industries dependent on mining for a market. Chief among these will be cement, explosives, soap and candle-making, milling and the hundred and one activities that centre in the Rand. Rhodesia and Mozambique will be given a separate and extended treatment. The different mines will be described and illustrated, and the recent progress of the industry in those territories dealt with comprehensively and lucidly. In addition, the issue will contain a number of interesting and valuable contributions from leading men in the mining and financial world, many of whom have already sent their congratulations on the decision to issue a special commemorative number of the journal. Numerous letters received from past Rand engineers and mine managers, now resident in all parts of the world, contain offer of contributions. These will form a unique collection of valuable views and reminiscences, and will considerably enhance the interest of the volume. The work will consist of upwards of 350 pages, printed throughout on art paper. Prizes are offered to artists for the best design of a suitable and striking character, and particulars are given in another part of this issue of other valuable prizes to be awarded in connection with the number. It may be added that the work will be prepared, produced and printed in South Africa, and will aim to cover the whole field of mining in this country, and to prove a fitting monument to the great industry with which, from the beginning, the *South African Mining Journal* has been associated. The co-operation of everyone interested in the industry is being enlisted to make the venture a success, and already it promises to mark an advance on anything of its kind ever before attempted in South African illustrated journalism.

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Review of the Year.

Problems of Industry.

Labour Questions.

Mr. Elkan's Speech.

Full Report.

Mr. M. G. Elkan presided last week at the thirteenth ordinary general meeting of Messrs. A. Goerz and Co., Ltd., held in the boardroom, Silesia Buildings. Among those present were Messrs. Clem D. Davies, Gustav Sonn, H. Neuhaus, W. R. Crowhurst, M. Rode, and the secretary, Mr. V. J. Ronketti, representing 520,426 shares out of an issued capital of 1,400,600.

The Chairman's Speech.

The Chairman, in moving the adoption of the report and accounts, said: Before proceeding with the actual business before us I wish to explain that this year we are holding our annual meeting about a month later than usual as your board was anxious to meet the wishes expressed by a large number of European shareholders to the effect that they desired to study the accounts as well as the directors' and consulting engineer's reports before parting with their proxies. To fall in with this reasonable demand the holding of our annual meeting had to be delayed. The reports and accounts which are now before you have been in your hands since the 27th of April and, no doubt, you have made yourselves fully acquainted with the contents thereof. The past year has been a very unfavourable one for South African finance companies, and it is with regret that the board has to place before you the present accounts. South African investments have not enjoyed public favour, and in consequence, but few realisations could be effected. Those which were made resulted in a profit of £65,383 18s. 3d., while £40,914 19s. 6d. was received in dividends and interest. These two amounts compare with £79,212 18s. 3d. and £53,471 13s. 4d. respectively in the preceding year. In rents, commission and sundry receipts there was a shortfall, as compared with 1911, of £20,971, mainly because 1910 showed an exceptionally large revenue from these sources. The expenses have been a little higher, viz., £4,170, largely due to our having opened last year an office in Mexico City, and to the cost of exploration work increasing by £4,024, but the additions under these heads have been partly offset by sundry savings under the other headings enumerated in the profit and loss account. The credit balance of this account amounted to £59,691 13s. 7d., and this has been decided to write down various items, including £57,756 1s. 6d. in respect of shareholdings. The balance of £38,568 14s. 5d., carried forward from 1910, has been brought forward into the new account unchanged.

Some Absorptions.

Turning to the balance sheet you will observe that the amount invested in shares and debentures in other companies, viz., £1,294,452 11s. 1d., is higher by £397,526 8s. 5d. than at the end of 1910. This excess is mainly due to our having provided working capital for the La Fe Mining Company, Limited, our Mexican mining proposition, to which I shall refer later on, and to the absorption by the Princess Estate and Gold Mining Company, Limited, of the Roodepoort Central Deep, West Roodepoort Deep and Norman properties, coupled with provision of working capital in connection with this amalgamation. You will observe that beyond the £57,756 1s. 6d., the amount appearing in the balance sheet against investments in shares and debentures in other companies has not been written down, as your directors hope that the depression in the South African market will be relieved before long. The market value of these items on December 31st last was £1,175,752 14s. 7d., or £118,699 16s. 6d. short of the book value, which stands at or under cost. This amount is more than covered by the reserve account of £160,000. The financial position is satisfactory. The company has in hand in cash, investments in first class securities, and in advances at short notice against security, etc., nearly £523,000. Adding to this the amount owing by sundry debtors and deducting the sum due to sundry creditors, there is an excess of cash assets over liabilities of £252,722 9s. The consulting engineer's report, which is in your hands, deals, as usual, not only with the work done on those mines our company is mainly interested in—and to which I will refer presently—but also with general mining conditions on these fields as they obtained during the period under review, namely, during 1911. You will, however, bear with me while I draw your attention to the most salient features.

Anxiety about Native Labour.

Many of you have no doubt heard or read—I might almost say ad nauseam—that the native labour supply continued to give generally a great deal of anxiety and caused much embarrassment. I am, therefore, particularly pleased to be able to point out that lately the labour position has been better than it has been for a long time past. At the end of May 216,827 natives were employed by the mining industry, and, though undoubtedly individual mines may be somewhat short of their actual requirements, the general position can be termed easy, and complaints on the score of shortage are not numerous. So far so good. Unfortunately, however, the matter does not stop at the number of natives employed; there are other very vital points, and they—let it be said straight out—are not satisfactory. With the ever increasing competition, the cost of procuring natives and the wages too, have been raised considerably to the serious detriment of working costs—a fact which naturally tells more heavily against low grade than against rich mines. Some of you will no doubt wonder why the controlling houses do not put an end to this state of affairs by combining and thus doing away with the half-dozen or so individual recruiting organisations, creating in their place one central organisation. That sounds easy enough to accomplish, but on investigation the position has been found to be full of difficulties. However, I am exceedingly pleased to be able to tell you that while but a fortnight ago the outlook with regard to the houses coming to a satisfactory agreement was anything but bright, the position has undergone a change within the last few days. I am to-day full of hope that the desired object—the creation of a central recruiting organisation—will be achieved within a brief period, and that such a combination would reflect favourably on the cost of native labour within a comparatively short time I need hardly mention.

Natives from Tropical Areas.

You are aware that quite an appreciable proportion of the mines' native labour supply is drawn from tropical areas. The employment of this class of labour has attracted a good deal of public attention owing to the high rate of mortality which prevailed among these natives, say six or nine months ago. It did not take us long to improve matters considerably, as was shown by the statement recently made by the Minister of Native Affairs in the House of Assembly. I would remind you, moreover, that the mortality among this class of natives in their own homes is known to be very high. However, everything is being done to reduce the death-rate still further, and no time or money is being spared to achieve this object. With this end in view, great discrimination is shown in the class of natives sent forward from the recruiting centres; only apparently strong and healthy "boys" are being engaged, and even of those received here quite a considerable proportion is, after careful medical inspection by our own doctors, who are very stringent in their demands, repatriated without having been sent to the mines to work, and I trust that we will soon succeed in reducing the rate of mortality to such a low level as will be absolutely satisfactory.

Labour Saving Appliances.

I need hardly point out to you that the industry is not content to rely on a satisfactory native labour supply for the purpose of working the mines to the best advantage; it is always on the look-out for labour-saving appliances, and in this respect very considerable advances are being made, so that I confidently expect to see a reduction in the individual native labour complement figures before very long. I cannot impress sufficiently on you the very great importance of such labour-saving appliances, and wish to assure you that this matter receives the most earnest consideration on the mines under our control, and so far, I am glad to say, with surprisingly encouraging results. Let me give you some figures. At the Geduld Proprietary Mines, during the last quarter of 1910, 40,200 tons were crushed for 101,118 shifts worked, while in the first quarter of this year, when small drills were being used to a much greater extent than previously, 40,830 tons crushed called for 85,529 shifts. And again, at the Lancaster West, taking the same periods as those just quoted, I find the following figures: Last quarter, 1910, 67,250 tons, 184,013 shifts; first quarter, 1912, 66,270 tons, 139,312 shifts. These figures, I think you will admit, are surprising, and show the labour saving which can be achieved by the use of mechanical appliances.

White Labour Complaints.

With regard to skilled labour, while 1910, compared with 1909, showed an increase of nearly 2,300 white employes on the mines, there was a small decrease in 1911, namely, 171, as against 1910, but this is of no importance. Many complaints are, however, received relative to the quality of this labour, particularly as to its efficiency. Whether this is due to a want of knowledge on the part of the men, or to other causes, I am unable to venture an opinion, but I should like to express the earnest hope that, on close investigation, allegations such as have reached me lately, which would point to a kind of conspiracy to do so much and such quality of work and no more, will prove to be wrong. Such tactics would certainly not prove to be in the best interests of the white employes on these fields. Notwithstanding what agitators may say it is a well-known fact that the mines have for years shown a keen desire to employ white labour in ever-increasing numbers. In support of this assertion I will quote the official figures as obtained from the Mines Department. For the period 1907-1908 the ratio of coloured to whites, taken on the yearly average number of employes, is found to be 9.3 coloured to one white, while for the period 1910-11 this figure was reduced to 7.7 coloured to one white. I think the white employes would be well advised not to make the employers regret this policy; they, the employes, would be the sufferers from a change. At last year's meeting your chairman alluded to the establishment of the training school for miners at the Wolhuter Gold Mine. It was hoped and expected that the youths of the country would take full advantage of the opportunities thus offered, but, I regret to say, that the response so far has not come up to anticipations. It is to be expected, however, that when the public realises the good chances offering to young men who would, by joining this school, make sure of a thorough and sound practical mining education, the indifference as shown at present will disappear.

Industry's Expansion.

During the period I am dealing with the gold mining industry has shown further expansion. With an addition of 415 stamps and 60 tube mills, the quantity of ore crushed has increased by nearly 2,500,000 tons to a total of 23,888,258 tons, from which gold to the value of £33,543,479, or 27s. 11d. per ton milled, has been extracted at an average cost of 18s. per ton. Of the gold so won £7,763,036 has been returned to shareholders in dividends. When comparing these figures with the 1910 results, it will be seen that the yield shows a decrease of 7d. and the working costs an increase of 5d. per ton, the latter, as pointed out in your consulting engineer's report, being due almost entirely to the greater expense of native labour. With the brighter outlook with regard to labour and costs—as a consequence of the ever-extending use of mechanical appliances—I anticipate that in due course working costs will come down to a more reasonable level, and that every nerve is being strained in this direction it seems hardly necessary for me to mention. Perhaps I should explain that the increase in the tonnage treated was brought about to some extent by the starting up of several new reduction plants on mines which previously were only in the developing stage. On the other hand, the decrease in the amount paid to shareholders in dividends of £1,112,999 as compared with 1910 is largely attributable to the regrettable state of the market conditions for South African mining shares, which rendered it impracticable, at least on reasonable terms, for companies to raise the funds required, and legitimately paid out of new capital, for mining purposes by the issue of further shares or debentures, thus compelling them to use part of the gold won to meet such expenditure.

Pessimism and Apathy.

The pessimism and apathy reigning in the South African Market is very acute, and appears to us here, who are in close touch with affairs, to be grossly exaggerated. No doubt mistakes have been made in the past—I am sorry for those who cannot make mistakes—but that every effort is being made to improve matters in every direction, nobody but those who have ulterior motives to serve will deny, and the time must come when investors will realise again that the mines offer very great possibilities and chances. To me it appears unintelligible that an industry producing about three millions sterling of gold per month should remain under a cloud so long, and I cannot help feeling that, to a considerable extent, anyhow, the cause thereof is not of the mines' making. In the consulting engineer's report in your hands it is pointed out how legislation piles additional expense on expense on the industry; the mines seem to be the "beast of burden" chosen by those in power when revenue is needed, and even when the exchequer is overflowing. A more equal distribution of taxation throughout the Union would, I am sure, go a long way towards re-establishing confidence in the minds of European financiers that the mines are not being unduly taxed, and would tend to induce them to let the mining industry, as well as the whole of South Africa have the funds it is in need of, and without which progress will be delayed unduly. A number of measures directly affecting the gold mines have received the attention of Parliament. Among others, the Mines and Works Act of 1911, which came into force in December last, limits the underground working hours and entails numerous innovations. On the whole, however, it is a necessary and workable measure. Sunday milling by newly erected mills is henceforth forbidden. As for the Estate Duties Bill, which rightly caused great uneasiness here as well as in Europe, I am glad to say it has been withdrawn—presumably in consequence of the numerous and very earnest representations made in the requisite quarters.

Miners' Phthisis.

The measure which affects the gold mines more than any other is the much-discussed Miners' Phthisis Bill, which provides for the compensation of those who unfortunately have contracted this terrible scourge. I wish to emphasise that those responsible for the management of the mines have never for one single moment tried to avoid their liability in this matter, but they hold, and, to my mind, rightly so, that the heavy burden should not have been thrown on the shoulders of the industry alone, for the niggardly contribution of the Government can hardly be termed a relief, particularly after the Government, during the 1911 session of Parliament, had admitted its obligation in this matter and had offered to bear half the burden as far as existing cases are concerned. However, it is useless to enlarge on the topic. The measure has been passed, and I am glad to state that it is a far more workable one than the original draft of the Bill. What the mines' liability will prove to be only the future can show, opinions vary considerably, but that it will be a heavy burden, unfortunately, cannot be denied. Of course, steps will have to be taken by the mines to spread the payment of the funds required over a period of years, so as not to lay the burden on one or two years only, but to distribute it over a lengthy period, say, of ten years, by means of which dividend distributions will, I trust, not be interferred with. Under the Act, power is taken not only to compensate the actual sufferers, but to devise ways and means to stamp out the disease, and I am quite sure that everybody concerned will willingly and lavishly assist towards attaining what must be supreme in everybody's mind, the stamping out of this awful disease. The investigations so far carried out by a committee consisting of engineers, miners, doctors and chemists, under the chairmanship of the Government Mining Engineer of the Union, which has been at work for about seven or eight months, show clearly that an early diminution in the number of sufferers can be counted on; in fact, it would seem to me that, owing to the improvements introduced in the mines in the course of the last two years or so, the worst period is over and that we are on the decline already. I need not detain you by dealing with other legislative measures passed—they are of minor importance and, generally speaking, tend to improve conditions.

Victoria Falls & Transvaal Power.

The electrification of a large number of plants on the mines, in anticipation of the power to be supplied by the Victoria Falls and Transvaal Power Company, was completed early last year; unfortunately, however, the Power Company was delayed for various reasons, the chief among which was the foundering of a steamer carrying considerable quantities of machinery, which it took many months to duplicate. The supply now obtained from the completed stations is giving general satisfaction, and an additional power station is in course of erection at Vereeniging, which is expected to be in full working order towards the end of this year, while the station at the Simmer Pan is going to be further increased—such increase will, however, only be completed during 1913. From the experience gained so far, I think I am right in saying that no doubt exists in anybody's mind as to the great savings to be obtained from the use of purchased electric power, as against steam power raised by the mines themselves, either when it is a question of equipping a new mine or any existing mine with a long life before it.

Water Supply.

In consequence of the rather severe drought some anxiety was felt and discomfort experienced during the closing months of last year. However, in no single case had any stamps to be hung up, or any other works to be stopped, and it was a pleasing feature to see that those mines which had a water supply of their own and had not to rely on the resources of the Rand Water Board alone, came readily to the assistance of other mines which were situated less fortunately. I do not think we need worry on this score as regards the future. With last year's experience before it, the Rand Water Board has made temporary arrangements for further supplies, which, unless extraordinary droughts should occur, should be ample for all requirements, and is studying the question very seriously whether or not to go in for a further large permanent supply, which, if it should be decided on, would certainly place the mines and the various Municipalities along the Reef in an undoubtedly safe position. The scheme being studied at present is a very large one, and before embarking on the considerable capital outlay that it would entail more information concerning the necessity for such a large supply is required. At present the water supply to Municipalities and mines is absolutely satisfactory.

Illicit Liquor.

There have been such endless complaints for years past on the score of illicit liquor supply to the natives, coupled with insufficient police protection, that at last the general public's clamours have borne fruit. The Government, I am very pleased indeed to say, nominated last week a strong Commission to thoroughly investigate the whole question; the reference to the Commission is a very wide and far-reaching one, and I am sure that every one connected with the mining industry will readily assist that body in its inquiries, so as to enable the Government eventually to create such improvements as will lead to a satisfactory state of affairs. That the mines are insufficiently policed is admitted. Hence, some of the rich mines have lately created a police force of their own, which, I understand, is giving good results; unfortunately, all mines cannot afford such luxury.

Following our usual custom, I will now put before you the main features of last year's operations of the various mining companies in which we are principally interested.

May Consolidated.

This company has continued to obtain satisfactory results. 184,470 tons of rock were milled, and gave a total yield of 6·659 dwts. per ton, or a reduction of 1s. 6·88d. per ton against the previous year, while the working costs were decreased by 3·28d., leaving a profit per ton of 13s. 6·94d., or a total, including sundry revenue, of £128.801 14s. 5d., out of which two dividends of 20 per cent. each, absorbing £115.000 in all, have been paid to shareholders The payable ore reserves at the end of the year stood at 212,707 tons, which is, of course, a smaller quantity than at the end of 1910. As has been pointed out to you on former occasions, the mine is drawing to the end of its life, and a reduction in the profits has to be faced during this year. The consulting engineer estimated that during the first semester of 1912 a profit of £38,000 would be earned. Judging from the results actually obtained up to the end of May, it is clear that this estimate will be slightly exceeded. On the 15th of this month an interim dividend of 15 per cent. was declared and will be paid to shareholders early in August. We must now become reconciled to the fact that the mine will reach the end of its profitable life at a comparatively early date—probably in the course of next year—but it is impossible at present to give any closer estimate on the point.

Lancaster West.

Last year this mine had the benefit of the centralised and modernised reduction plant, with the result that a saving of 9.5d. per ton milled was effected in the working expenditure, and this, notwithstanding the considerable increase in the cost of native labour which had to be faced. To counteract these oft-recurring shortages in the supply of natives as well as the high cost thereof, a much larger number of machine drills of various types are now being used at the mine, and as very good results are being obtained in working by this method any dearth of native labour which may occur in the future can be contemplated with rather more equanimity than was possible in the past. Though the yield from the ore milled last year showed a decline of 2.3d., this was counterbalanced by the gold won from the treatment of accumulated slimes. Including sundry revenue, of £7,682 3s. 10d., a total profit of £40,903 1s. 5d. was earned, and the debenture debt has been reduced to £110,080 by the repayment of the £10,700 drawn for redemption, while a further repayment of £11,300 will take place on the 1st prox. in respect of this year's drawing. The development work is being pushed ahead steadily, with varying results. This work is somewhat interfered with by the number of dykes and faults encountered from time to time, which necessitates a large amount of driving in barren ground. Altogether, 16,605 feet of development work was accomplished during 1911, of which, however, 25 per cent. consisted of crosscuts driven in order to overcome the displacement of the battery reef caused by longitudinal faults. The payable and available ore reserves as established at the end of 1911, totalled 472,700 tons, of a value of 6.65 dwts., as against 431,000 tons of a value of 6.76 dwts. at the beginning of that year. An encouraging feature in the recent development is found in that the Botha Main Reef is showing rather satisfactory results; it is somewhat early in the day to make a definite statement, but if the values lately disclosed continue, the prospects of this mine would be materially improved.

Princess Estate.

During the past year this company absorbed various adjoining properties, and consequently the figures relative to its working results must not be compared with those obtained in previous years. Moreover, as the amalgamation called for the centralisation and modernisation of the reduction plants and numerous other surface works, operations generally were much interfered with, and it is only quite recently that these re-arrangements have been completed. Work underground became disorganised in consequence of the old Roodepoort Central Deep Shaft having to be closed down for about six months for repairs as, owing to moving ground, it had become dangerous and imperilled the safety of the employees. Advantage was taken of this opportunity to modernise the shaft and headgear arrangements, which heretofore were not conducive to rapid hauling. While the shaft was closed down the underground labour force got unavoidably dislocated, and when it could be placed in commission again the shortage of natives was more pronounced than at any other time during last year, with the result that the mine found itself in severe straits. Notwithstanding that small drills had on previous occasions been tried in the Roodepoort district and had not proved particularly successful the mine made a new attempt in that direction so as to overcome, if possible, the labour shortage, and, though some encouraging results were achieved, they did not approach anything like the results obtained in other mines of the Group. During 1911 the amalgamated company paid a dividend of 5 per cent., absorbing the amount of £28,751 13s. Practically only since the beginning of this year has the centralised plant been running—in fact, the erection of the last ten stamps to bring the central up to 60 stamps was only completed in May last. During the period under review, the old plants at the Princess Estate and Roodepoort Central Deep, together dealt with 166,368 tons, which gave a yield of 7.059 dwts. or 29s. 10.8d. per ton milled. The results obtained last year you must clearly understand cannot be taken to show the true value of the mine, but are due principally to the disorganisation, to which the high cost of the native labour force has to be added. The available and payable ore reserves stood at the begining of the year at 656,500 tons of a value of 7.26 dwts., besides which there are a further 44,300 tons of a value of 10.05 dwts. opened up, but, being required mainly for shaft pillars, cannot be mined at present. Development was greatly hampered last year, being practically stopped altogether in the Rodepoort Central Deep Section during the last six months of that period. However, since then the shaft has been replaced in commission and an adequate labour force secured and development work is now proceeding once again. The development recently carried out in the lowest levels of the Central section of the mine has shown very encouraging results, and working costs are being reduced by degrees.

Geduld Proprietary Mines.

Right through the past year, as well as during the current year, this mine has shown steady progress. Attention has been mainly directed to pushing development ahead so as to justify the carrying out of the long-desired aim of increasing the reduction plant beyond its present capacity of, say, 14.000 tons per month. During 1911, altogether 11,445 feet of development work was accomplished; even better progress has been made since the beginning of this year, in that for the first five months 5,966 feet of such work has been effected, and unless circumstances quite unforeseen should interfere, I have no doubt that last year's development figures will be considerably improved upon. It is, however, the actual tonnage opened up and the value thereof which constitutes the main interest. The ore reserves at the beginning of this year amounted to 607,300 tons fully developed of an average lineal assay value of 8·18 dwts. over 44·2 inches, and a further 190.500 tons of a value of 9·08 dwts. over 42·6 inches were indicated by 4,975 feet of development, but before this latter tonnage could be said to be absolutely available for mining some further work had to be done. These tonnages combined give a total of 797,800 and compare with 546.000 tons opened up at the end of 1910. which is, you will admit, a very satisfactory advance. The tonnage developed since the commencement of this year will only be established when the reserves are measured up—these figures are only worked out annually—but I have no hesitation in stating that the development work up to date has shown up very satisfactorily indeed, so that I am extremely hopeful as to the result. One of the most gratifying features of recent developments is the increase in the width of the reef opened up.

In view of these encouraging results, the board of directors of the company decided in May to increase the reduction plant to a capacity of 24,000 tons per month, and overtures were made to our company relative to the provision of the necessary funds, namely, £125,000. We have always readily accorded the companies under our control any financial assistance sought for, and in this instance we agreed to guarantee the projected issue of 125,000 of the reserve shares at par, obtaining in return, as the only consideration for such guarantee, an option for two years over a further 100,000 shares at 25s. per share. The 125,000 shares were offered to Geduld shareholders in the ratio of one new share for every six shares held, and you may have seen from the Press that they accepted about 75 per cent. thereof—the exact figure being 93,634 shares—leaving us to take up 31,366 shares.

The new machinery and plant has been ordered and the necessary work at the mine to enable the increased tonnage to be handled cheaply and efficiently is already in hand. I trust that when we meet next year I shall be able to inform you that the enlarged and modernised plant is in full and satisfactory working order. Reverting to last year's operations, I may mention that 138,860 tons were crushed, or 11,350 tons more than in 1910. The value at 26s. 9·1d. per ton shows an improvement of 3s. 3d., while the working costs at 21s. 8·5d. are just 8d. higher. The working profit, including £4,923 sundry revenue, amounted to £39,969, as compared with £20,634 in 1910, thus showing an increase of £19,335, or nearly 100 per cent.

I cannot conclude my reference to this company without expressing my conviction that it is now on the high road to prosperity; it has had more than its fair share of misfortunes and disappointments in the past, but the developments during the last six months or so are of such a nature that I am really full of hope and look forward with pleasure to the time when the enlarged reduction works will be in a positon to deal with 24,000 tons per month. Of course, I do not expect that the Geduld will stop at that tonnage—with a property consisting of 2,481 claims that would be ridiculous. Development will be pushed forward energetically with a view to increasing the capacity of the reduction plant beyond the 24,000 tons for which preparations are now in hand, and, if the results are such as I anticipate and trust they will be, then, gentlemen, I feel sure the board of directors will not delay matters, but will further enlarge the plant to a capacity more commensurate with the size of the property.

Modderfontein Deep Levels.

At our last annual meeting the chairman stated that the reef was expected to be struck at the depth of approximately 2,750 feet in No. 1 shaft, and that, unless anything untoward happened in the intervening period, we expected to have got down to the reef before now. Well, gentlemen, the progress made has been very satisfactory and the actual depth attained last night in No. 1 shaft was 2,783 feet and in No. 2 shaft 2,501 feet. So far absolutely no trouble on account of water has been met with in No. 1 shaft, but some little delay was caused thereby in No. 2 shaft, which accounts for the smaller footage sunk there. The reef has not yet been cut, however, and from recent disclosures it appears that a steepening of the strata has taken place. The company's technical advisers now estimate to strike the reef at or about 3,000 feet. You have no doubt seen announcements in the public Press that our immediate neighbours the, Government Gold Mining Areas (Modderfontein) struck the reef in their north-west shaft about a fortnight ago at a depth of 2,395 feet, at which point an assay value has been disclosed of 7.15 dwts. over 31 inches, which may be considered satisfactory. I am indebted to the chairman of that company for the further information that the reef where struck dips at an angle of 14 degrees, and this augurs exceedingly well for the Modderfontein Deep Levels. The steepening of the strata that has evidently taken place is indicated by the above figure of 14 degrees. If the reef is also found to have a similar dip in the ground of the Modderfontein Deep Levels the value of this property would be enhanced as the ore contents would naturally be materially increased. With the progress made in sinking it should not be long now before the shafts reach the reef and then development will immediately be proceeded with. I should, perhaps, mention that having to sink the shafts somewhat deeper than originally estimated will not adversely affect the finances of the company; the amount originally allocated to shaft sinking will prove to be sufficient for the increased depth owing to considerable savings having been effected in the work so far done as compared with the amount originally budgeted for.

South Randfontein Deep.

You will have seen from the consulting engineer's report that a considerable amount of work has been done on this property, but that unfortunately the results obtained were not satisfactory, owing to the mining area having been found to be more disturbed than had been anticipated. The funds of the company having become exhausted and, finding it impossible to raise additional capital except on very onerous terms, the board considered it advisable to favourably entertain an offer from the Randfontein Central Gold Mining Company, Limited, the immediate neighbours, to acquire this company's claim property, machinery, plant and certain other assets for 75,000 fully paid shares ranking pari passu with its existing issue. The shareholders at an extraordinary general meeting, held on April 10th, confirmed the provisional agreement entered into with the Randfontein Central, and the transaction has since been completed. At the wish expressed by large shareholders, an extraordinary general meeting of shareholders has been convened for July 2nd, for the purpose of considering the advisability of voluntary liquidation, and if agreed to of distributing the assets to shareholders pro rata to their shareholdings. From the proxies received so far I anticipate that the company will decide to go into liquidation, but before giving effect to the resolution which I expect to be adopted on July 2nd a confirmatory meeting has to be held which has been convened for July 24th. Assuming that voluntary liquidation takes place shareholders will receive one Randfontein Central share for every six shares hold in the South Randfontein Deep and perhaps a small cash distribution resulting from the sale of the remaining assets. The chairman at the meeting of the South Randfontein Deep held on April 10th pointed out that as shareholders of the Randfontein Central G. M. Company, South Randfontein Deep shareholders would become immediately interested in one of the largest producing companies on these fields, which according to its published reports, is earning very considerable profits. While regretting that the company should have lost its individuality owing to circumstances over which the board of directors had no control, I sincerely hope that shareholders will be compensated through having become interested in the Randfontein Central Gold Mining Company, Limited.

Van Dyk Proprietary Mines.—No active work has been done and the property is in the hands of a caretaker. Times are not propitious for placing the company's financial position on a sound basis and I am afraid shareholders must wait until conditions generally allow the resumption of mining operations.

Tudor Gold Mining Company.—My remarks relative to the Van Dyk apply also to this company.

South Western Exploration.—Acting on the technical advice received, the board of directors decided in June last year to stop the prospecting operations and also abandoned a number of options and claims held, but retained the myr pacht rights on a portion of the fa Rietvlei No. 113.

Randfontein Deep.

The chairman of this company pointed out at the annual meeting held recently that the shaft sinking operations had been stopped in consequence of it having been found that the funds at the disposal of the board would not be sufficient to reach the reef and that the obtaining of additional funds in the present state of the market is precluded—at last on reasonable terms. The company has still considerable funds in hand, enabling it to maintain its property until general conditions become more favourable and allow of the resumption of mining operations.

Springs Mines.

It is expected—provided, of course, that nothing untoward happens—that the reef will be encountered in the north shaft before the end of the year, while it will take a few months longer to reach it in the south shaft. The company has suffered greatly in the past from water troubles, but these have now been successfully overcome. Situated as this property is there is every reason to anticipate that it will give a good account of itself once production starts.

Brakpan Mines.

This company has been producing now for just over a year and you will have seen from the returns published the steady progress which has been achieved—in fact, lately it has been going ahead by leaps and bounds. The high expectations I always held of the value of this proposition are being fully proved and I see no reason whatsoever for anticipating any set back. You will have seen that the company has declared a first dividend of 15 per cent. and I anticipate that henceforth this company will be paying even increased dividends at regular intervals. I think you will agree that it is a very excellent achievement for a gold mining company to start paying dividends after only one year's production.

City Deep.

No doubt you have seen that the chairman stated at the annual meeting that the mine was emerging by degrees from its difficulties, that he anticipated a dividend would be paid at the end of this year, and that the company's legal advisers made a very reassuring statement concerning the validity of the company's titles, some of which, as you know, are being attacked. From the development figures put before the meeting by the chairman it is evident that this company will shortly occupy a prominent place among the large producers of these fields and the profits earned should certainly be satisfactory.

Modderfontein "B" Gold Mines.

This company entered the ranks of producers during last year, and has ever since given a very good account of itself. The prospects are very bright, and I think we may expect the company to pay its first dividend towards the end of this year.

Exploratory Work in South Africa.

The exploratory work which we have carried out in various parts of South Africa has not given sufficiently encouraging results to warrant spending further moneys on the particular properties. We therefore abandoned all such options held and are not doing any such work at this moment; should any promising propositons be submitted to us, you may rest assured that we would again undertake such work immediately.

You will remember that we had opened an office in Salisbury. We found, however, conditions not sufficiently encouraging, and have closed the office since the beginning of this year.

South West Africa Company.

This company has been able to pay a dividend of 5 per cent., plus a bonus of 2½ per cent., for the financial year ended 31st December last. The company's cash, gilt-edged securities and loans accounts amount to £1,768,544 after deducting the sums due to sundry creditors, equal to more than the issued capital of £1,750,000. Prospecting operations have continued to be carried on in various parts of German South-West Africa, i.e., in the areas covered by the company's own concession as well as in that held by the Kaoko Land and Mining Company, and several gold-bearing deposits with promising indications have here been found. Further investigations have also disclosed the existence of three iron deposits of good value in the concession of the last-named company.

The South-West Africa Company continues to hold a considerable interest in the Otavi Mines and Railway Company, and is in receipt of regular dividends from this source.

Otavi Mines and Railway Company.

The shipments of this company for the twelve months to March 31st, 1912, have been slightly lower than in the preceding financial year. They have amounted to about 29,600 tons of ore, 1,420 tons of copper matte and 900 tons of metallic lead. The working of the railway has been most satisfactory. The receipts from this source were M.4,699,000 and the working expenses M.2,190,000, so that the working profit was M 2,509,000, from which the rental due to the Government has to be deducted.

Mexico.

Development work on the La Fe y Anexas property, in the Zacatecas district, has proceeded uninterruptedly. The disturbed political situation in Mexico has practically not interfered with work, and the only detrimental effect has been that supplies have come forward somewhat slowly. We have had this property in hand for some time now, and it was decided not to float it until such time as the development work had reached a sufficiently advanced stage to enable a mill to be ordered. The work done has continued to give very encouraging results, especially when it is remembered that we have not yet reached the unoxidised zone, where, according to the general experience of the district, the best values are found. We are therefore pleased to record that the value of ore increases at each succeeding level. So far three levels have been completely driven in the ore chute at depths of 125, 177 and 246 feet, in addition to which much other work in the way of raising, winzing and crosscutting has been done in order to bring the ore into the developed class, and sinking to the fourth level at 348 feet is in progress. Having already reached a fairly advanced stage with the work, we registered the La Fe Mining Company, Limited, in December last. Besides acquiring the La Fe y Anexas property, in which we had a substantial interest by reason of our former option and our share interest in the old Mexican Company owning the ground, the new company has taken over from us four other mining areas. Of its capital of £600,000 in £1 shares, 250,000 shares were issued to the old Mexican Company and ourselves as vendors, 275,000 shares were subscribed by us at par, and 75,000 shares are held in reserve free of any option. Exhaustive metallurgical tests have been carried out on the ore, with the result that it is shown to be eminently suitable for cyanide treatment, and in view of the character of the ore, the considerable width of the vein, and the fact that the mine lies within one and a half miles of the railway, costs are expected to be low. Plans have been got out for a milling, concentrating and cyaniding plant of a capacity of 100,000 tons per annum, and the orders for this plant are now being placed and the excavations proceeded with, so that in about a year's time this new company should reach the producing stage. As you will have seen from our report, we have extended our interests in Mexico, and we have promising indications, but operations have not yet sufficiently advanced for me to be able to speak more particularly about them.

This completes the review of the operations of our companies and of those concerns in which we are particularly interested, and I think I can rightly claim having touched on the main points of interest. I cannot conclude, however, without expressing my thanks to the various staffs, technical as well as commercial or secretarial, not only of our company, but also of those concerns which are under our control, for the good services rendered during the period under review.

The report and accounts were adopted.

Sir Carl Meyer and Mr. James Zutrauen were re-elected to the directorate.

Messrs. Price, Waterhouse and Co. and Messrs. F. W. Diamond and English were reappointed auditors.

SOUTH RANDFONTEIN DEEP

Extraordinary Meeting.

An extraordinary general meeting of the South Randfontein Deep, Ltd., was held in the board-room, Silesia Buildings, on July 2nd. Mr. H. Neuhaus presided, and those present were Messrs. W. R. Crowhurst, V. J. Ronketti, A. G. Gill, F. Elkan, and W. M. Tudhope, secretary.

The Chairman proposed the following resolution: That this company be wound up voluntarily, and that Henry Rogers, of Pinners Hall, Austin Friars, in the City of London, be, and he is hereby appointed liquidator for the purpose of such winding up at a remuneration of £600, and that he be, and he is hereby, authorised and directed to distribute in specie so far as is practicable among the shareholders of the company, according to their respective rights and interests, all shares in the Randfontein Central Gold Mining Company, Limited, which form part of the assets of the company.

In doing so the Chairman said: You will remember that at the meeting held on the 10th April last you authorised the directors to give effect to a provisional agreement, by which your claim property, machinery, plant and certain other assets were sold to the Randfontein Central Gold Mining Company, Ltd., for seventy-five thousand shares of the nominal value of £1 each, fully paid up of that company. I then gave the assurance that, before disposing of these shares, your board would take steps to ascertain your views. Since the date of that meeting the transfer to the Randfontein Central Gold Mining Company, Ltd., has been completed, with the result that, in addition to the aforementioned shares, the only other asset owned by your company is a certain amount of cash, which will be sufficient to meet all liquidation expenses, and probably leave a small surplus for division among shareholders. In the interval many important shareholders have expressed their desire that the Randfontein Central shares should be divided among South Randfontein Deep shareholders at the earliest possible date. In order to carry out this wish, it is proposed to put the company into liquidation, and to appoint Mr. Rogers, the London secretary, as liquidator.

Mr. Brinkana said that he was the holder of two hundred shares, and he agreed to the resolution, excepting in regard to the payment of the liquidator. He thought £600 too much.

The Chairman explained that there was a good deal of work attached, and this sum would be divided between two men, not one.

The resolution was then put to the meeting and carried unanimously.

POTCHEFSTROOM EXPLORATION.

Annual Meeting.

The annual meeting of the Potchefstroom Exploration Gold Mining and Estate Co., Ltd., was held at the offices, Transvaal Bank Buildings, last week. Mr. G. Sonn was in the chair, and among others present were: Messrs. A. Gill, H. Daniel, M. Ullmann, O. Scheuermann, F. Elkan and H. Williams.

The report of the directors for the year ending the 31st March, 1912, showed that the property of the company comprises: (a) Welgegund No. 84, 8,293 morgen 497 square roods, freehold; (b) portion of Syferkuil No. 328, 1,944 morgen 200 square roods, freehold; (c) Droogegrond or Stukgrond No. 692, 1,203 morgen 547 square roods, freehold. At the last annual meeting of the company shareholders were informed that the directors had decided to abandon the right to the mynpacht on Muiskraal, and to take instead thereof a piece of freehold of equal extent, viz., 292 morgen; on going into the matter, however, it was ascertained that the attendant costs would be in excess of the value of the ground and it was eventually resolved to abandon the company's interest in the farm. The right to quarry flint on Welgegund has been let for a period of three years. In April last the directors, on consideration of representations made to them, employed a prospector to open up a line of formation on the company's property. The work is still in progress, but up to the present time results have been of no value. Shareholders will remember that during the year special meetings were held for the adoption of a new memorandum and articles of association. These were duly adopted, and have since been registered as the constitution and code of the company. During the year the company's revenue has been £634, and expenditure, which was largely augmented by the costs in connection with the new articles, £783. The appointment of Messrs. E. Friedlander, J. A. Cohen and A. G. Gill as directors of the company, was confirmed. The retiring directors were re-elected and the auditor was re-appointed.

APEX MINES.

Amalgamation Proposal.

Result of Negotiations.

London Opinion.

Sir George Farrar's Views.

The adjourned fifteenth annual meeting of the Apex Mines, Ltd., was held on Wednesday, in the board room, National Bank Buildings, Col. W. Dalrymple presiding. Among those present were Sir George Farrar, D.S.O., Messrs. J. H. Ryan, E. J. Way, G. R. Airth, G. C. Fitzpatrick, F. Chapman, J. Andrew Cohen, C. P. Marais, E. R. Read, C. R. Pinder, W. J. Gau, W. J. Haley, C. H. Barclay, H. Smit, E. M. Hind, C. A. Wentzel, G. W. Austin, E. W. Bond, and the secretary, H. P. Webber.

The Chairman, in moving the adoption of the report and accounts, said: The report of the directors for the year ended 31st December, 1911, together with the audited statements of account, are before you for your adoption. These were issued in March last in deference to a wish that the general body of shareholders should have ample time for perusing them before the annual meeting which, as you are aware, was convened for the 22nd of May last, or about two months later in the year than usual. When, however, the date fixed for the meeting arrived negotiations with regard to a proposal to amalgamate your company with the Benoni Consolidated Gold Mines Limited, were proceeding, and as these had not reached such a stage as to admit of a definite statement on this subject being made to shareholders, it was decided to adjourn the business of the meeting for four weeks. The negotiations proved more prolonged than was anticipated and a further adjournment until to-day was then decided on, and it is now my duty to announce that the negotiations have terminated with negative results. I propose, however, with your permission, to deal first with the general affairs of your company and the operations of the past year, after which I will come back to this matter.

Profits on Coal.

From the accounts you will see that the net profit on coal winning amounted to £44,190, which, together with £14,634 brought forward from 1910 accounts, makes a total of £58,824 for appropriation. Of this, £30,000 has been distributed in dividends to shareholders, £14,327 was appropriated for the completion of the new coal equipment which was taken into commission in the early part of the year, £1,500 represented the remuneration paid to directors in terms of the company's articles of association on the declaration of the dividend, £2,790 was paid to the Government in respect of profits tax, and the balance of £10,207 has been carried forward. You will remember that the cost of the new coal equipment, including the new shaft, headgear, etc., was met out of profits from the coal section; the outlay on this plant, I am pleased to say, came well within the estimates. The plant continues to run economically and is a complete success.

Output Falls Off.

The output of coal shows a falling off of 17,830 tons, and the profits are less by £2,858. It is regrettable that this diminution in the output should occur, seeing that the mine and plant are capable of dealing with a much greater tonnage. The development represents 211,578 tons of clean coal, which is slightly less than the tonnage of marketable coal produced during the year. The Transvaal Coal Owners' Association (1910), Ltd., continues to be our selling agent. Our business relations with that association have been quite satisfactory, and it is hoped that the colliery owners will be successful in arranging for the re-formation of the association on equitable lines when the present arrangement expires in a year from now. The interests of the coal industry will thus, by co-operation, be safeguarded in the only possible way, taking into consideration the fact that the margin of profit is so finely cut. Two interim dividends were declared, representing a total distribution of 10 per cent. You will be asked to confirm the action of the directors in declaring these interim dividends.

Your directors decently declared an interim dividend of 5 per cent for the half-year ended the 30th of June, and it is interesting to note that shareholders have already received from the operations of the colliery over £300,000 in dividends.

Gold Section.

Turning now to the gold section, it will be observed from a perusal of the accounts that at the close of the year a balance of £100,093 remained on capital account, but of this amount some £20,000 was in the form of assets such as shares in other companies, freehold stands, with cottages thereon leased to employes under the hire purchase system, and other items not immediately realisable, leaving at the close of the year a sum of about £80,000 available for the further opening up and development of the property. This has been utilised to block out as large a tonnage as possible in the northern workings, consequently the sinking of the main incline was suspended for the time being in the month of January, 1912. The cash available for the exploitation of the gold section is now practically exhausted, and the question of the provision of further funds is an urgent one. Reviewing the work of the past year, the payable ore reserves, which, on the 31st of March, 1911, were first declared as 80,791 tons, had, at the close of the year, reached a total of 258,060 tons, having a milling value of 8.5dwt., over a width of 54.2in.; there were also 79,199 tons of unpayable ore. From these figures you will notice that the payable ore amounted to 76.5 per cent of the total development. Since the close of the year, development has further improved, and at the 30th of June the reserves stood at 450,020 tons of payable ore having a milling value of 6.34dwt., and 142,618 tons of unpayable ore, the percentage of payable to the total ore being 75.9 The actual footage driven, risen, and sunk for the year amounted to 15,721 feet, including 1,369 feet in the main incline shaft, while, since the close of the year, 9,633 feet have been driven, risen and sunk, including 170 feet in that shaft. Of the footage driven on the reef during 1911, 7,685 feet were sampled, of which 4,020 feet were in payable ground, while, since December, 4,780 feet have been sampled, of which 2,835 feet were in payable ground. This, I think you will agree with me, taking all the circumstances into consideration, is satisfactory showing in the early stages of the development of the mine. I am glad to be able to state, also, that the developments of the last few months have disclosed no new faults or dykes of a serious nature, and we are therefore led to expect a settled area in front of us.

Pay Zone Located.

It is the custom to carry sampling operations from 100ft. to 150ft. behind the face of the drives to allow boxholing to expose the whole of the reef, and the manager estimates that if sampling were brought up to the present faces the total tonnage of payable reef would probably be not less than 500,000 tons. From the foregoing you will gather that the results to date from your gold section demonstrate that your mining area has been located in a pay zone and that your directors are justified in coming forward to shareholders to ask them for the necessary financial support to bring the company to the producing stage. I will, however, deal with this matter later. The water difficulty, to which we made reference last year, and which was so seriously aggravated by the lack of the necessary equipment to cope with it, was overcome, and no further interruption of the development programme has taken place from this cause. The pumping equipment which has been installed consists of two 15,000 and one 30,000 gallons per hour three-throw ram pumps, located at the bottom of the north vertical shaft, and in addition three 10,000 gallons per hour pumps of a similar design in the main incline. The conveyer belts in the main incline shaft are now working from the fourth level, and we have in every way demonstrated that they are capable of doing what was anticipated from them in the matter of the transport of ore. Negotiations with the Government in connection with the location of your owners' rights and the proclamation of the farm had not reached finality at the close of the year. Since the publication of the report of the directors the mynpacht has been granted, as has also a lease of the mineral rights of the area underlying the railway; the farm has not yet, however, been proclaimed, and this is a matter which still rests with the Government. Prior to the proclamation of a farm the owner is entitled under the Gold Law to select a mynpacht equal in area to one-fifth of the total area proclaimed. When your company located its mynpacht it was found that the Johannesburg-Springs railway line traversed the ground from west to east. As, according to the provisions of the Gold Law, the undermining rights of ground under railways are vested in the Crown, it was impossible to obtain our mynpacht title to the railway ground, and it was necessary, therefore, to accept a mynpacht divided into two sections by the railway. After negotiations with the Government, in order to consolidate our mining area, arrangements were made whereby the company obtained a lease of the minerals under the railway, in exchange for which it agreed, in its application for mynpacht, to apply for an area reduced by an amount equal to the area of the railway lease, plus 5 per cent. This 5 per cent., equivalent to about one and one-third morgen, represented the area which the Government considered that the company should forfeit in view of the fact that the railway area is situated much nearer the outcrop than the extreme boundary of the mynpacht relinquished by the company, and taking the circumstances into consideration, your directors had to admit the equity of the argument and the reasonableness of the deductions.

Gold Mining Rights.

The total area of gold mining rights possessed by your company is now as follows: Mynpacht, 686 morgen 587 square roods; railway lease, 27 morgen 51 square roods; total, 714 morgen 38 square roods; equal to about 1,028 precious metal claims. To these must be added 87 discovery claims, making a total holding equal to about 1,115 claims. You will, however, bear in mind that this does not mean that your company has to pay claim licences on the total area. The annual rental for the mynpacht is £343 10s., and ordinary claim licences are payable only on the area of the railway lease and the 87 discovery claims.

Sir George Farrar, Sir Abe Bailey, and Messrs. F. D. P. Chaplin and G. Sandilands have resigned from the board since our last meeting, and it is with extreme regret that I have to record the loss to your board in the death of the late Mr. Harold Strange, who was for many years associated with the administration of your company. Since the close of the year, the manager of your gold section, Mr. W. G. Holford, resigned his position, and Mr. E. H. Bulman, the late general manager of the New Goch Gold Mines, Limited, was appointed in his place. I have pleasure in testifying to the zealous manner in which the staffs of the head and mine offices, both gold and coal, have carried out their duties during the past year.

Negotiations with London.

I now come to the question of the negotiations which have passed between Johannesburg and London in connection with the proposal to amalgamate this company with the Benoni Consolidated Gold Mines, Limited, and to provide the necessary working capital. These negotiations have been carried on for some time past, and as I have before mentioned, have not resulted in any scheme being adopted. The proposals came in the first instance from this end, and took the shape of a debenture issue, together with certain shares under option to both subscribers of the debentures and guarantors. The advantages which were apparent to this company in the amalgamation scheme were: (a) The possibility of commencing crushing within a year on the basis of 40,000 tons per month. (b) The immediate availability of about a million tons of payable ore reserves, which would be considerably increased before crushing was commenced. (c) The use of the Benoni workings as a second outlet for the Apex Mines and for ventilation purposes would obviate the necessity of sinking the south shaft. On submitting the scheme to our London friends, however, they were of opinion that this company would incur grave responsibilities and run a great risk in connection with a scheme which entailed such a large debenture issue as was proposed. They were of opinion that the Apex Company should finance itself on a smaller scale simply with the object of continuing development without at the moment making any provision for the acquisition or erection of reduction works. They therefore made counter proposals on these lines.

Mr. Leslie's Recommendations.

It was at this juncture that Mr. C. D. Leslie, of the Consolidated Gold Fields of South Africa, Limited, was invited to investigate the proposals for amalgamation, and he submitted his report, dated the 10th of May, 1912, which is before you, under which he recommended the amalgamation of the two companies as being in the best interests of both. Acting under his terms of reference he based his calculations as to a fair purchase price for the assets of the Benoni Company on the assumption that the Apex Company would pay the debts of the Benoni Company, amounting to about £200,000; that the coal section of this company would be floated off and considered as a separate property and not included in the amalgamation, and that the combined Apex-Benoni company would commence crushing operations on the basis of 40,000 tons per month. He, however, recommended that crushing should be commenced at the earliest possible moment on a basis of 30,000 tons per month, viz., in about nine months' time, and that this capacity should be increased after the first year to 50,000 tons per month, and after the second to 70,000 tons per month. He further expressed the opinion that the amalgamated company would not require the south shaft.

London Criticism.

Very considerable correspondence now passed between London and Johannesburg on the interpretation of Mr. Leslie's report and points arising therefrom. Alternative schemes were put forward by both London and Johannesburg embodying the coal section in the proposed amalgamation as giving greater security, but in spite of every effort no agreement could be come to. The ideas permeating the London criticisms of the schemes formulated on this side have been that the assessed number of shares to the Benoni Company was too liberal, but more particularly that a large debenture issue might prove too great a strain on the resources of the company seeing that for some time to come the profits from the coal section can be the only source of income available to provide for debenture interest. It has also to be recognised that in the present state of the South African market a share issue either with or without a reasonable issue of debentures which would give the amount of money necessary to take over the Benoni Company's liabilities and at the same time provide the working capital required is impossible. Further, it is the opinion of our London friends that at the present time the acquisition of reduction works is a secondary consideration and that we should rather at this juncture, by means of a moderate debenture issue, which could be largely safeguarded by the profits from the colliery provide funds to secure a continuity of our development programme, and await a general improvement in the South African market before considering the more comprehensive scheme. Their views we are forced to respect, based as as they are on a wide experience of such undertakings.

Item in the Report.

Dealing with Mr. Leslie's report, remark may be made on what appears to be a discrepancy between the value of the ore reserves as stated from time to time in the company's reports and the value as set down by Mr. Leslie. Mr. Leslie estimates, including a certain tonnage partially developed, the average value of the total ore reserves at the date of his report on a milling basis was 6 dwts. per ton, whereas the figures which have been given you from time to time in the reports referred to show that the average value on a milling basis of the ore developed over the same period was 6.43 dwts. per ton. The difference is accounted for by the following explanation. Mr. Leslie was asked: "to report as to the payable ore reserves existing in both companies' grounds on the basis of the mine sampling, subject to such checks as you think advisable, taken in conjunction with the values as per mine sampling met in the surrounding properties." It is evident that Mr. Leslie discounted these values, whereas, of course, the values which are stated by us from time to time in the reports are the actual values as found in the mine. In dealing with the properties on a combined basis, Mr. Leslie makes the yield 5.291 dwts., and our calculations show that from the actual ore developed in the two mines concerned the average is 6.03 dwts. In other words, owing to the fact that Mr. Leslie has discounted the values through adhering strictly to the terms of reference, there is a difference which is shown by the following figures: average grade of both mines, 25s. 6.40d.; Mr. Leslie's estimate, 22s. 2.72d.; difference, 3s. 3.68d. This difference represents the amount of revenue which we expected to recover in excess of Mr. Leslie's estimate if we adhere strictly to the value of the ore reserves as they stand, without taking into consideration the values in surrounding properties. We would, here, assure shareholders that we have no reason to amend the estimates which have been arrived at with regard to the value of your development and ore reserves as published. Your board have now before them the necessity of providing funds for the continuation of development work in the mine. This question is now the subject of correspondence with our London friends, and it is hoped that satisfactory arrangements will be arrived at, as it would be a misfortune to be forced to suspend operations at this juncture. I now beg formally to move the adoption of the reports and accounts before you, and the approval of the action of the directors in declaring interim dividends Nos. 14 and 15.

This was seconded by Mr. G. C Fitzpatrick.

Sir George Farrar.

Sir George Farrar said: Gentlemen,—I think the negotiations which you, Mr. Chairman, have referred to are very important. You have alluded to them at some length, and I hope shareholders will pardon me if I also refer to them. (Hear, hear.) As I have been brought into the matter, I think it is only fair to the board that a very clear statement should be made in regard to the whole matter; because I feel sure that, with the publication of Mr. Leslie's reports and the chairman's remarks, shareholders will then, themselves, go into the whole question and form their own opinion on the merits of the case. This is a very important juncture in the company's history, because you, Mr. Chairman, have foreshadowed about the company being out of funds: and, naturally, some arrangement must be made immediately to put the company in funds; and I hope if the company is put in funds it will not be on a piecemeal policy, but on such a basis that we shall see the company on a good way towards a producing stage.

The Largest Shareholder.

I think I am the largest shareholder in the Apex Company, and also a large shareholder in the Benoni Company: and, early in March last, on my return from England, I spent a considerable time, and took a good deal of trouble, in looking into the affairs of both these companies. The Benoni Consolidated Gold Mines, Ltd., was in debt: and the funds of the Apex Mines, Ltd., would, it was evident, be exhausted by the middle of the year; and, therefore, it was essential, at the earliest possible date, to put before shareholders some arrangements for placing both companies on a proper financial footing. In March last, it became apparent to the directors of the Benoni Company that, owing to the failure of the new cyanide process, they would have to shut down, pending the erection of a new plant: and, at the same time, the Apex Company—and this is a very important point—having only a single outlet (thereby restricting the number of workmen that can be legally employed) were discussing the possibilities of providing a second outlet, for purposes of safety and ventilation, by some other manner than by sinking the south dip shaft at a very great cost and connecting same with the incline shaft.

The Amalgamation Proposals.

As the natural result of the position in which the two companies found themselves, the question of an amalgamation arose, and the merits of such a scheme were somewhat closely gone into; one of the chief advantages, as far as the Apex were concerned, being the ease with which a dual exit and efficient ventilation through the Benoni west shaft could be obtained—the estimated cost of this connection being approximately £20.650 (made up of £6,000, equipment, Benoni west shaft; and £13.000, underground connection), as against an estimated expenditure for securing a dual exit through the south shaft of approximately £200,000 (vertical shaft £135.000; incline shaft, 3,600 feet, at £15, £54,000). The connection through the Benoni mine also provides, according to the consulting engineer, the only feasible alternative ventilation scheme to the sinking and connecting of the incline and dip shafts. This connection would, I am told, take about twelve or fifteen months to carry out.

As the amalgamation scheme was more closely discussed, other advantages which both companies would derive from it became apparent; one of the chief being that, by an expenditure of approximately £50,000, the present Benoni plant could be fully equipped with a new cyanide portion consisting of either a Butters filter or decantation process as far as the slimes were concerned, and the crushing capacity of the mill brought up in 30.000 tons per month, and, at a later period to 40.000 tons per month, and that the combined companies could in consequence look to be on a producing basis within nine months, as against a period of at least four years before the Apex could hope to be a producing mine with double exit and ventilation through the dip shaft.

Benoni Assets.

The value of the Benoni assets was carefully gone into, and after making an allowance of £40,000 for the unworkable section of the sands and slimes plant, the balance of the reduction plant, which is to all intents and purposes new, was found to cost £138.427, the share in the power station £32.906, the share in the K.G.C.A. £33.596, and sundry equipment, trucks, buildings, etc., £40.671 or a total of £245,600.

This is irrespective of any value that may be placed on the permanent shafts, winding engines, boilers, and other plant, estimated by the consulting engineer at £100,000—included in this figure being the sum of £40.000 expended since the last reconstruction of Benoni in shaft sinking, station cutting, etc. (the combined distance sunk in the eastern and central shafts being 2,223 feet)—and also irrespective of any valuation placed on the result of the development work carried out by the Benoni Company, which, according to the mine figures, is a payable reserve of ore standing in the mine at the time of closing down the mill, amounting to 537.475 milling tons, of an average grade of 6.43 dwts., the unpayable tonnage being 360,733 tons, averaging 3.31 dwts.

Taking the value of these various assets into consideration, it was felt that, in the event of any purchase of the Benoni Company by the Apex, it would be a necessary condition that the terms of purchase should, firstly, provide for the repayment of the Benoni debts in full, amounting to practically £200,000, and that in further consideration some certain number of shares should be given to the Benoni Company, as in addition to the above-enumerated assets, there remains, of course, the potential value of the unworked and unproved claim area.

Mr. Leslie's Report.

The question of the purchase of the Benoni Company by the Apex Company was discussed by both boards of directors, and the advantages of such purchase were recognised by all parties concerned; and I then advised both boards that, prior to any definite scheme being put forward, it was absolutely imperative that an independent engineer of the highest standing should report on the whole position, and that, if his report recommended an amalgamation I was prepared to co-operate in every possible way with the Anglo-French Exploration Company, the controlling house, in submitting a scheme for the approval of shareholders, and, at the same time, I was also prepared, with my friends, to guarantee the greater proportion of the necessary working capital.

It was eventually arranged that Mr. Leslie, the well-known superintending engineer of the Consolidated Gold Fields of South Africa, Ltd., should make such a report, and the following terms of reference, unanimously agreed to by both boards, were submitted to him for the purpose of this report, viz.:

1. Is the absorption of the Benoni Company by the Apex Company desirable and is it a sound mining proposition?

2. In view of the Apex Company being a single outlet mine, is the connection with the Benoni west shaft a feasible and a good working arrangement?

3. It is proposed that the Apex Company first float off into a separate company the lease of their coal rights, giving share for share to present Apex shareholders, viz., 300.000 shares. This, on the present coal profits, will give approximately 10 per cent. profit per annum to shareholders in the coal company. The issued capital of the Apex Company is £300.000 in £1 shares, and it is proposed to give to Benoni 133.000 fully-paid new shares of £1 each for the purchase of all their assets and to take over their liabilities (approximately £200.000). My board desire to know if the allocation of shares as between the Apex and Benoni is equitable to both. If not, please give your valuation.

4. To report as to the payable ore reserves existing in both companies' grounds, on the basis of the mine sampling, subject to such checks as you think advisable taken in conjunction with the values as per mine sampling met in the surrounding properties.

5. It is proposed to raise approximately the sum of £600.000 for the purpose of placing the mine in a position to crush 40.000 tons monthly, about twelve months from present date, to be allocated more or less on the following lines (it being understood that the amount of £200.000 provided for development and shaft sinking will not be reduced)—(the amount of £138.732 for surface equipment, as per statement "A." has been arrived at by Messrs. Way and Bulman):

To liquidate Benoni liabilities..	£200.000
Surface equipment, as per statement "A"	138,732
Development	150,000
Shaft sinking..	50,000
Incline shaft equipment, Apex section: 1,500 feet belt installation	9,000
Three stations and bins ..	6,000
	£553,732

(General charges, including interest during construction, cost of amalgamation, and debenture issue, not included.)

In view of the fact that, out of the above amount, a minimum of £200.000 will be available for shaft sinking, development, and connection with Benoni, please state if the payable ore reserves position at the end of twelve months will be sufficiently strong to maintain a monthly crushing of 40.000 tons. When crushing commences, a sufficient amount will be allowed for in working costs for the replacement of payable ore extraction.

6. Is the sinking of the Apex south shaft necessary, in view of a connection being made with the Benoni west shaft?

It was further agreed that if Mr. Leslie advised a lesser number of shares than 133.000 to be given to Benoni, the board of that company would agree to Mr. Leslie's allocation.

Amalgamation Scheme Outlined.

As far as the negotiations had proceeded up to this point, they were always on the understanding that the Apex coal rights were to be excluded, and Mr. Leslie's valuation of the two companies, which is dated the 10th of May, was naturally made on this assumption, and it will be noticed that his valuation of the proportionate number of shares to be distributed to present Apex and Benoni shareholders, after allowing for the payment of the Benoni liabilities, approximates with extreme closeness to the figure submitted to him in the terms of reference.

A precis of Mr. Leslie's report was cabled by the Anglo-French Exploration Company to their head office in London, and, owing to their taking objection to the method adopted in Mr. Leslie's report of arriving at the basis of share distribution to the two companies, which basis they considered was too favourable to Benoni, it was decided to leave the matter in abeyance until Mr. Leslie's arrival in London, when they would have the advantage of a personal discussion with him, and it was at the same time decided by the boards of the two companies to postpone the annual meetings for a month, which time was considered sufficient to enable the local boards and the London committees to come into line. At the same time, Mr. Henderson Clarke, the London managing director of the Anglo-French Exploration Company, was on his way to South Africa, and we were asked by the Anglo-French Exploration Company, London, to await his arrival.

Mr. Leslie was interviewed by the London committee on about the 7th of June, and final discussion took place here on the 14th of June, with the London managing director of the Anglo-French Company, Mr. Henderson Clarke, some days after his arrival here. The following scheme was agreed on by your board, approved, and, I understand, recommended by Mr. Henderson Clarke, and cabled to the Anglo-French Exploration Company, London board—the scheme naturally being subject to any reasonable amendments recommended from London, because, of course, I agree with you, Mr. Chairman, that anything the Anglo-French Exploration Company's London board recommend to us must have the greatest weight and consideration:

	Shares.
To Apex Company, including coal rights	300,000
To Benoni Company	80,000
£600,000: 6 per cent. debentures, convertible at 30s. into ordinary shares of the company for 3 years, 10 equal drawings, beginning fourth year, if converted—all offered to shareholders (out of this issue the Benoni Company indebtedness to be paid)	400,000
Option to guarantors for two years on 120,000 shares at a price to be agreed on	120,000
Making a total capital of ..	900,000
Reserve	100,000

Negotiations Break Down.

It will be noticed that this scheme for the first time includes the coal section of the Apex property, as it was decided that it would facilitate the raising of the necessary money if this section was included. The difficulty of arriving at an accurate valuation of the coal section was appreciated, because so much depends on the consumption, the quality as compared with Witbank district, also the possible reduction of railway rates in favour of Witbank, notice of which reduction has since been given. Your board, however, fixed what they considered a fair valuation.

Under this scheme the number of shares to be offered to Benoni shareholders was approximately 20,000 shares below those figured-on in Mr. Leslie's report, after making the necessary deduction for a fair value of coal assets. It was felt that, rather than that the whole business should fall to the ground, the utmost endeavour should be made to meet the views of the London Board of the Anglo-French Company, by offering the Benoni shareholders a reduced number of shares. But I regret that on the 24th of June, we received information from the Anglo-French Board in London to the effect that they were not prepared to agree to the unanimous recommendation of your Board, and submitted counter-proposals which were placed in front of the Benoni Board, who were unable to entertain them—thus terminating the negotiations.

I may say that, as the largest individual shareholder in your company, I do regret that the Board of the Anglo-French Company have not been prepared to accept the unanimous advice of the Board of your company, and, I understand, not only of their local representatives—to whom I think we owe considerable thanks, because they have done their utmost in the whole of these negotiations—but also of their own managing director from London, who, since his arrival, has given considerable time to, and thorough inquiry into, the matter.

The reason, I understand, that the Anglo-French Exploration Company could not agree to the recommendations of your Board, is that they repudiated the conclusions arrived at in the report of Mr. C. D. Leslie, the independent consulting engineer; and this I extremely regret.

Advantages of Amalgamation.

The report of Mr. Leslie—a absolutely independent engineer, of the highest standing—will be in your hands to-day; and I think that that report justifies, in every detail, the decision of the Board with regard to the advantages of a scheme for the absorption of the Benoni Company. It agrees with the figures suggested by the boards of the two companies concerned, and distinctly states that such an arrangement would be of a fair and an equitable character; and that on a basis of 40,000 tons per month, neither the Apex nor the Benoni properties, worked independently, can be considered as being so sound a mining proposition as when worked conjointly, and that the arrangement, if carried through, would lead to a profit from mining which would reflect creditably on the transaction, as being just and advantageous to shareholders. Another point very strikingly brought out in Mr. Leslie's report is that, by making the necessary connections with the Benoni shafts, the sinking of the Apex dip shaft is obviated as far as any purpose of ventilation is concerned. When the large amount of money involved in the sinking of this shaft, and the connection of same with the incline shaft, is taken into consideration, it must be recognised what a very important matter this is from the Apex shareholders' point of view. Failing a connection through Benoni, our consulting engineer distinctly informs your board that, before the Apex Co. can become a producer on a tonnage basis in any way commensurate with the size of the property, the necessary ventilation can only be provided through the dip shaft. I mention this because there is a distinct difference of opinion between your board and the London board of the Anglo-French Exploration Co., who are most strongly of opinoin that the Apex south shaft must in any case be sunk, if not ofr ventilation purposes, then as the quickest means of developing the eastern section of the Apex Co.'s mynpacht contiguous to Brakpan Mines, Ltd., where they expect to develop better quality ground. The company's consulting engineer is, however, of the opinion that this section can be more cheaply and expeditiously developed by means of a subsidiary incline sunk more or less in an easterly direction from the present main incline, thereby obviating the necessity of sinking the south shaft for development purposes.

Another important feature of the combined scheme is that the properties can be producing within a period of nine months, on a scale of 30,000 tons per month, and, later, 40,000 tons per month; the alternative being the eventual raising of a considerably larger sum of money than is required under the joint scheme, and the deferring of any working profit, outside the coal profits, for a period of four years or more, during which time it is estimated that standing and other charges would increase capital expenditure by another £100,000.

I have, at some length, gone into the whole question, so that shareholders may be fully informed as to the views of your board, and I sincerely regret that the efforts of your board to obtain the co-operation of the London board of the Anglo-French Exploration Co.—the controlling house of your company—have failed.

In conclusion, Sir George Farrar said: Our thanks are due to you (Col. Dalrymple), and I know you have done your best so that the board could have been prepared to bring before shareholders some final scheme. Anyhow, as the negotiations have failed, I hope the board may see their way clear to submit other proposals to the shareholders. (Applause.)

Mr. G. C. Fitzpatrick, as one who had no interest directly or indirectly with the Benoni Company, said he wished to say he was in accordance with the views of Sir George Farrar. When the negotiations were first commenced, they did not appear to be very attractive; but after the report of Mr. Leslie it seemed to be obvious the Apex would greatly benefit. The Anglo-French in London had been somewhat unreasonable. At the same time he could quite understand their point of view. He thought when Mr. Leslie's report had been published, and the shareholders had had an opportunity of seeing it, a reasonable compromise might be arrived at. Possibly the Anglo-French in London would be able to increase their offer and the Benoni would reduce their price a little.

Mr. J. H. Ryan thought that at a stage like the present, when money was hard to obtain, a scheme for which the money or a large portion of it was practically assured should have been accepted in view of the fact that the Apex was nearly out of funds, and that an enormous amount of money would be required to sink the south shaft.

Mr. W. T. Haley said that as an ordinary shareholder it seemed to him a waste of £200,000 to sink the shaft, when by a reasonable agreement it could be disperned with. He suggested the directors of the Apex should reconsider the matter and try their utmost in the interest of the poor shareholders to come to some arrangement. He remembered buying Apex shares at £6 5s.; to-day he fancied they were about £1 10s. He trusted the directors would try to bring about amalgamation. He never knew a case where amalgamation was so desirable.

Mr. C. Chapman also though amalgamation would be in the best interests of the company. He enquired why the sales of Apex coal had not increased, what effect the reduction of the rates from Witbank would have on the company's profits, and whether the dividends from coal were likely to be reduced on this account.

Colonel Dalrymple Replies.

In replying to the discussion, Colonel Dalrymple said: I will first of all attempt to answer the questions of Mr. Chapman. Now, with regard to why the sale of the Apex coal has not increased. As you know, we are a member of a co-operation, the Transvaal Coal Owners' Association, Ltd., and the basis of the formation of that association was fixed on a relative tonnage allocated to each company, and that basis has been scrupulously worked to. It was the only way we could get co-operation. We have had that tonnage allocated to us, and we have no reason to complain. You have got to bear in mind that your product is not of the same calorific value as Witbank coal. A strong point is our geographical position, and if it was not for the very satisfactory geographical position we hold, probably we would not be able to sell the same quantity at the same price as we are selling at now. The tendency nowadays in regard to coal is that through—in many instances—boiler power being somewhat short on the fields, the mines go for the very best product they can get. With regard to the recent alteration in railway rates, this will have an effect on the sale price of the Apex coal, but I am sorry to say that just at the moment we have not been able to gauge it exactly, and no doubt it will have the effect of reducing your profits. It is not what the coal owner has got for his coal at the pithead that has been the trouble in the past, it is the extremely heavy rates which have been in existence since the inception of these goldfields. The coal line has been used as a huge profit earner for the Government, which you will fully realise when I say that for a distance of between fifty and ninety miles the rate works out at 5s. 2d. per ton for fifty miles, and 7s. 1d. for ninety miles. The general public will be satisfied with the reduction in these rates, the only thing they will complain of is that the reduction has not been sufficient. Now, as to whether the earning power will be reduced to affect dividends, this may or may not be, it is a very close thing; probably this will be the case. We have succeeded for some time past in giving you on your capital a 10 per cent. dividend per annum from the coal section, which absorbs £30.000 per year. In addition, we have paid for the whole of our new coal equipment out of profits. However, the Apex Colliery, at this juncture, is not what we consider the main asset of your company, it is a subsidiary asset, and we look to your large gold area as the main asset. Now, gentlemen, remarks have been made by Mr. Fitzpatrick, Mr. Ryan, and our old friends, Mr. Haley, on the question of amalgamation, and I do not think that any of us here are prepared to take any very serious exception to the recommendations; we are of the opinion on this side—taking everything into consideration—that amalgamation, on fair terms, is in the best interests of your company. Personally, I think, what is seriously concerning the London people is not so much as to whether Benoni should, or should not get a few more shares; I think the real question is the system which has to be adopted in raising money at this juncture when depression is reigning in connection with mining ventures in South Africa, and it is the overwhelming debenture issue which is entailed in consequence; that is, to have a debenture isue of, say, £600.000 on the company's assets with limited development, they do not consider sound finance. Of course, why our capital in the Apex Company in the past has been kept so low is simply because we have succeeded, and I think we can congratulate ourselves on it, in being able to raise funds through share issues at a very satisfactory price. In fact, a matter of two years ago the shareholders cheerfully took up 50,000 shares at £5 per share, and I think shareholders had the opportunity of making profits, because the shares went up. But with the shares at the price they are today—30s.—and times abnormally bad, at least we hope so, our friends in London are afraid to try to raise a matter of £600,000 with the Sharemarket in its present condition, and it naturally means a serious prejudice to existing shareholders, who have taken up issues at high prices in the past, unless they are able also to take up their pro rata of issues at the ruling low price. It is a pity at this juncture if there should be any cleavage with regard to the question of raising money. We must give both sections the credit of doing what they believe in the best interests of the Apex Company at the present moment, hence I trust that though we have had this setback, there will not be a tendency to adopt a "dog-in-the-manger" policy, but as Mr. Haley says, we should do our best at a very critical period on these fields to co-operate and get forward a scheme which will lead to effective working capital being provided, and so that we can reach the producing stage at the earliest moment, because, while a company is only developing and spending large sums of money, things are difficult and there is serious risk, but when you have a mill working, you can fight adversity for a period.

As I have said, their point is the huge debenture issue, and standing charges in connection with the debenture issue being very high, they think that it might prejudice the stability of the company and create the position where the company would fall into the hands of the debenture holders.

Gentlemen, I think I have answered the questions which have been put to me, and I thank the meeting for the very sympathetic and helpful manner in which our proceedings have been conducted, and I assure you that the board will do their best to effect such a scheme as will gradually bring the company to a producing stage on a proper scale, and become, as I believe it will, one of the largest producers of gold on these fields, if the depression will only lift and give us a chance to finance in a reasonable way in which a substantial share issue should play a part.

The report and accounts were adopted.

The appointments of Messrs. C. R. Pinder, J. H. Ryan, G. R. Airth and G. W. Higgins, as directors of the company in place of Sir George Farrar, Bart., Sir Abe Bailey, K.C.M.G., Mr. Gordon Sandilands and the late Mr. Harold Strange respectively, were confirmed.

Colonel W. Dalrymple and Mr. G. C. Fitzpatrick were re-elected directors.

Messrs. F. W. Diamond and English and A. E. Page were reappointed auditors.

THE BENONI MEETING.

Directors and Engineer.

" Having it Out."

Full Report of Proceedings.

Speaking at the annual meeting of the Benoni Consolidated Gold Mines, on Thursday, Colonel W Dalrymple said: As you are aware, the annual general meeting of this company was convened for the 23rd of May last, but as certain negotiations were then proceeding for the amalgamation of your company with the Apex Mines, Ltd., and as the negotiations had not reached such a stage as to admit of a definite statement being made to shareholders on that date, it was decided to adjourn the business of the meeting for a period of four weeks. The negotiations were, however, more protracted than was anticipated, and as no conclusion had been arrived at when the date fixed for the adjourned meeting had been reached the meeting was again adjourned until to-day, and it is now my duty to inform you that the negotiations have failed and that further consideration of the scheme has been abandoned by the Apex Mines, Ltd.; I will, however, deal with this matter later on. The directors' report and accounts for the year ended 31st December, 1911, are before you for your consideration. The balance sheet shows that at the close of the year the loan from the company's bankers stood at £148,661, while a further £18,000 had been borrowed from the Jumpers Gold Mining Company, Messrs. Farrar Brothers, and the Anglo-French Exploration Co., Ltd. Further liabilities had been incurred in connection with the equipment of the property amounting to £33,205, making the total indebtedness of the company £197,866. Against this there was cash at bankers and gold in transit, £6,535, and sundry debtors and payments in advance £18,200, or £24,735 in all. The net cost of preliminary running at the close of the year amounted to £17.709, after deducting the gold recovered to that date. Since the close of the year a further £7,000 has been called up in terms of the agreement with the Jumpers Gold Mining Company, Limited, Farrar Brothers, and the Anglo-French Exploration Co., Ltd., while up to the 30th of April a further net loss on working account of £2,108 was incurred. As you have already been informed, crushing operations were stopped at the beginning of May. Since then the management has been busy in cleaning up the gold which was absorbed by the works, and 1,902 ounces of fine gold have been recovered of a net estimated value of £8,000. Against this, certain expenditure, in connection with the running of the plant for the few days in May, and the cost of closing down the works was incurred, during May, amounting to £5,459. While dealing with the gold absorbed by the works, I must inform you that it is estimated that in addition to the 1,902 ounces actually recovered a further amount of between 400 and 650 ounces of fine gold is contained on the plates, which can only be recovered by destroying them.

Financial Position.

The financial position at the 31st of May, after allowing for certain charges for interest, etc., showed an excess of liabilities over cash and cash assets of £174,402. As, however, certain cash assets, such as the cost of placing ore on the dump, etc., which are available against future costs in a profit earning mine, cease to be available when work is suspended, the actual cash deficit at the 31st of May, 1912, amounted to £195,018. I now wish to review the events from the reconstruction of your company in the early part of 1909, which have culminated in the suspension of operations pending the readjustment of your finances. You will doubtless remember that the old Chimes West, Limited, and the Benoni Gold Mines, Limited, were amalgamated on the following basis:

	Shares.
The shareholders of the Benoni Gold Mines, Ltd., received in the reconstructed company	66,000
The liquidator of the Chimes West, Ltd., received as purchase price for the property, assets and undertaking of that company	29,687
Working capital subscribed for at par amounted to ..	170,000
The options offered to subscribers of working capital and taken up by them and the guarantors were	128,562
While there were held in reserve	5,751
Making a total registered capital of	400,000

The debts of the Old Benoni Gold Mines, Limited, and the Chimes West, Limited, were then approximately: Benoni Gold Mines, Limited, £21,115; Chimes West, Limited, £20,236; and these were met out of the working capital provided. The principal guarantors were Messrs. Farrar Bros., E. Friedlander and Company, and the Anglo-French Exploration Company, Limited, while, in view of their subscribing £50,000 towards the working capital required, the Jumpers Gold Mining Company, Limited, received options over 33,333 shares, which are included in the above 128,562. The amount of capital originally raised was £170,000, and in due course the options were exercised, providing a further £160,800, and after making allowances for the liquidation of the aforementioned debts, the capital available for the operations of the reconstructed company was, in the first case, £120,000, this being subsequently increased when the options were exercised to £280,000.

Reconstruction.

At the special meeting held on the 8th of January, 1909, to consider the reconstruction of the company, the proposals placed before shareholders were that a reserve of 250,000 tons of ore should be developed, and that milling should be commenced on a basis of 10,000 tons per month. On the reconstruction, as already mentioned, certain shares were under option to the subscribers of the working capital, and when, in terms of the agreement entered into, these options were exercised in July, 1909, the board considered it advisable to utilise the additional working capital provided in enlarging the scope of operations, and it was resolved to double both the tonnage of the ore reserves and the capacity of the plant. Thus, at the annual meeting which took place in 1910, I outlined to you that it had been decided to develop 500,000 tons of payable ore before miling should commence, and to erect a reduction plant capable of treating 20,000 tons per month. A site for the reduction plant, specially chosen for its suitability was selected on the property of the Apex Mines, Ltd., and the plant was so designed as to be capable of enlargement with the intention that it should eventually be worked as a joint plant with that which the Apex Company proposed to erect adjoining it at a later date. At that time the board had under consideration the question of the design of the secondary treatment plant. The initial experiments with a twelve foot cone in connection with the Arbuckle Continuous Treatment Process which promised high extraction and low working costs were entirely successful. As a result of these experiments a complete plant consisting of three cones (30 feet diameter by 30 feet deep) and of eight air treatment tanks of the Brown type were erected at the East Rand Proprietary Mines, but experiments with this plant were not, at the time, sufficiently advanced to enable an opinion to be formed as to the final possibilities of the Arbuckle process.

Up-to-Date Equipment.

The anxiety of the board to erect the most up-to-date and efficient equipment caused them to repeatedly postpone their decision on the question of the advisability of installing the Arbuckle continuous process plant instead of adopting the ordinary percolation and decantation process, but, in order that when a decision was come to, there might be no delay, drawings and specifications of both plants were prepared and issued to the European firms who tender for this class of machinery. After prolonged experiments and investigations the results obtained from the Arbuckle plant were such that the technical adviser of the board considered that he was in every way justified in recommending the adoption of this process, and the directors, after going thoroughly into the question, bearing in mind the great saving both in capital cost and cost of running, also the improved extraction, all of which had been foreshadowed as the results of the adoption of the new process, decided to instal the Arbuckle process. From estimates based on trial tenders it appeared that the cost of the Arbuckle plant would be in the neighbourhood of half that of the ordinary percolation and decantation plant to treat the same tonnage, and that the amount authorised by the board for the installation of the reduction plant would have been exceeded by nearly £30,000 had it been decided to erect the latter. Unfortunately the subsequent tenders let for the work, though they were in every case the lowest, were much higher than the original trial tenders upon which the estimates of the cost of the plant were based. This would have applied equally to the decantation and percolation plant, as it was partly due to the increase in the price of raw material and partly to increased cost of manufacture consequent upon railway and other strikes. This increase in the cost of the manufactured articles and the extraordinary delays and late deliveries of machinery account in a measure for the difference between the estimated and actual cost of the Arbuckle plant. As a matter of fact, I believe that the contractors, with hardly an exception, were unable to carry out their contracts within the stipulated period, and some portions of the machinery were delivered many months after due date. I wish here to emphasise that it was not lightly that your directors decided on this installation, but only after the most careful investigation by your consulting engineer of the experiments carried out to prove the process and exhaustive discussions with him on the question.

Installation Completed.

In the middle of November last the installation was completed and the preliminary trials necessary in all new plants were commenced. I can state at once, with regard to the crushing and sorting arrangements, the mill and tube-mills, the amalgamating and classifying installations, that these sections of the reduction plant have given complete satisfaction and that as far as they go, the company has one of the most efficient equipments on the Rand; this expression of opinion is confirmed by Mr. Laurie Hamilton in his report on the company's property.

In the cyanide works, however, difficulties were experienced from the outset, the first trouble being with the Arbuckle screw elevators attached to the dewatering and desolutionising cones. These, after many adjustments, failed to satisfactorily elevate the settled pulp in the cones and had, at length, to be abandoned in favour of the centrifugal pumps which had already been installed as stand-bys to meet emergencies. When the figures for the month of December were available, and it was ascertained that the company had been running at a loss, the low extraction of gold was attributed to the absorption which takes place when a plant is first put into commission. Your board were here faced with the difficulty that it is impossible to exactly determine what this absorption is, as even that on the mill plates will vary considerably with different qualities of copper used in their manufacture, and the absorption in other parts of the plant is even more difficult to gauge. This, you will notice, has been fully borne out by the amount of gold which has been obtained from the final clean up on cessation of operations, when gold to the value of £8,000 was actually recovered, apart from the gold still left in the plates. As regards reduction costs, these were, of course, far too high, but allowance had to be made for the new equipment, especially as the design itself was also novel, and it was expected that they would be considerably reduced when it was in proper working order.

Difficulties Manifested.

Taking into consideration these factors, and the custom prevailing on these fields in respect of the starting up of new works, it was decided not to make a complete declaration for the month, and an announcement was accordingly made to shareholders through the Press, giving particulars of the tonnage treated and gold recovered. It was at this stage that the screw elevators were definitely discarded, and we then had no reason to assume that any further difficulties would be experienced, as the preliminary treatment of sands had so far proved satisfactory. On stopping the screws, however, several difficulties at once began to manifest themselves, presumably as the direct result of the altered conditions of working. The first difficulty that became apparent as the result of the failure of the Arbuckle screws was that the original method of disposing of the residue slimes, namely, by depositing them on the top of the residue sands on the belt running to the sands dump, had to be abandoned, owing to the fact that to enable the centrifugal pumps to deal with the slimes these had to contain such a large percentage of moisture as to make this method of disposing of them impracticable. The next trouble, and a much more serious one, was that it was found that under the altered conditions of working difficulty was experienced with the running of the settling cones. These had been designed on the supposition that the settled slimes would be continuously removed by the Arbuckle screws. Owing partly to the fact that there was insufficient capacity in the cones, and also to the fact that through the substitution of centrifugal pumps for the Arbuckle screws, the removal of the settled slimes was no longer continuous but intermittent, the three dewatering cones required such close supervision that constant trouble was experienced with the settlement of the slimes. The air agitators next gave trouble, as, owing to the separation of the sand and slime in the process of treatment, it was found that considerably more air was required than was provided by the compressor installed with the plant. This was overcome by a pipe connection with the main compressor in the east shaft, but owing to the losses in friction in the pipe this method of supplying the necessary air was a very extravagant one, and resulted in extremely high power costs. As a result of these troubles with the cyanide plant, the operations for the month of January yielded a loss of £2,649, and it was consequently decided to discontinue, for the month of February, the treatment of slimes, and to endeavour by crushing a greater tonnage and by using all the air agitators for the treatment of the sand product to obtain as large a revenue as possible. Here again we were faced with more difficulties, owing to the frequent stoppages of power, many in themselves trivial and occasioned in the majority of cases by the inexperience of employes, which resulted in the stopping of the air compressing plant and the consequent silting up of the air agitators, leading to very considerable delays before this portion of the plant could be got running again. Thus, in spite of considerable sacrifice in recovery values in order to obtain a high tonnage the tons milled for the month amounted only to 19,000, and the profit was negligible.

Specialist's Services.

In March and April further endeavours were made to remedy the inherent defects of the plant, but without success, and in the middle of the latter month the board secured the services of Mr. F. L. Bosqui, the consulting metallurgist to the Rand Mines, Limited, to give a report on the plant and make recommendations as to the best means of placing it in working order. This report unfortunately confirmed the conclusion which had been forced on your directors that the cyaniding equipment as it stood could not be operated successfully, and means were suggested by which, in Mr. Bosqui's opinion, the defects could be remedied. These, however included extensive alterations and additions, and entailed considerable further expenditure which the company was not in a position to meet, and the board was therefore reluctantly compelled to give orders for the suspension of operations at the end of April. The output for April was declared in due course, a profit of £776 resulting after a certain amount of gold had been recovered from the final clean-up of the works. This final clean-up was proceeded with throughout May and June, and the additional gold produced therefrom amounted to 1,902 ounces. I wish now to quote from a report from our consulting engineer, the following figures setting forth his estimates of extraction obtained and the gold called for and recovered:

Summary of the position is as follows:

Total gold called for.	Fine ozs.
From mill and tube mills	18.013
From cyanide works	4,219
	22,232

Total gold recovered.	Fine ozs.
From mill and tube mills	17.[illegible]
From cyanide	4.177
	21.521

SUMMARY OF OPERATIONS.

Gold obtained:		
Mill and tube mills	16.254	
Cyanide	3.385	
Final clean-up	1.902	21.521
Gold unaccounted for.		
Mill and tube mills	19	
Cyanide	42	61
Gold remaining in plates:		
Estimated		65[illegible]
Gold in untreated products:		
Sands	1,367	
Slimes	3,416	4,784
Gold in residues:		
Sands	1,222	
Slimes	88	1,280
Gold in untreated black sand:		
Estimated		80
		28,57[illegible]

Some Handicaps.

In reviewing the operations of the company since the erection of the reduction works was first commenced, I should, perhaps, state that apart from the undoubted failure of the cyanide plant to come up to our expectations, we have been handicapped by shortage of funds caused, partly by under-estimation of the cost of the surface equipment, which led us to put more money into the underground workings than our financial position warranted. At the same time it should be borne in mind as already inferred that this under-estimation was not entirely due to errors on the part of the technical staff who were entrusted with the preparation of the estimates, but was to a very considerable extent caused by delays on the part of the suppliers of the machinery, and a rise in the price of raw material, brought about, in some measure, by railway and other strikes in England. Our difficulties, from the financial aspect, were again further enhanced, after crushing operations had commenced, by the loss of gold in slime and solutions, both run to waste and stored owing to the inability of the plant to deal with the whole of the mill product. The directors have no wish to disassociate themselves from the recommendation of their consulting engineer, as the whole case for both plants was put very clearly before them, and the final decision rested in their hands. I must explain to you that your board was constantly buoyed up by assurances that it was only a question of having patience, and it was that which justified the notice issued to you on the 29th of November, which stated that "the consulting engineer was perfectly satisfied with the ultimate efficiency and economy of the whole reduction plant." It was also acting under the same assurances, and in the further belief that the substitution of the centrifugal pumps for the Arbuckle screws in December would ultimately solve all difficulties, that your board added the following to the published notice of January 12th: "Reduction works up to and including treatment of sands have from the first worked quite satisfactorily, the only difficulty experienced has been in connection with the slime treatment. As explained, this has now been overcome, and anticipate in future that whole plant will run smoothly without stoppage."

Tonnage Developed.

As regards the mine itself, the tonnage developed at the date of the commencement of crushing operations amounted to 606,177 tons of payable ore of an average mill value of 6.47 dwts., and 362,507 tons of unpayable ore of an average mill value of 3.28 dwts. These figures, owing to the fact that current development had not, through lack of funds, kept pace with the abstraction of ore, have now been reduced to 521,000 tons of payable ore of an average mill value of 6.44 dwts., and 360,738 tons of unpayable ore of an average mill value of 3.31 dwts. The assay value of the tonnage crushed has closely agreed with the average value of the published ore reserves of the mine, and your directors repeat the statement they published on the 13th of April to the effect that "as far as mining operations were concerned, the results up to date must be regarded as entirely satisfactory." Gentlemen, I have endeavoured to show you that in all the transactions which have led up to the present position, the board acted only after most careful deliberation, and on the advice of their technical advisor, it is unfortunately now useless to further labour the point that this advice resulted through an error in judgment, and unnecessary to state that it was given in all good faith and with the desire to give your company a plant embracing the very latest ideas in metallurgical practice. The plant has not come up to our anticipations, and the company has now to face the necessity of finding the means to rectify this. We cannot disguise from ourselves that, had we installed an ordinary percolation and decantation process, your mine should to-day have been yielding reasonable profits, and your liabilities would have been considerably below their present figure. On the other hand, the arguments in favour of installing the present cyanide plant were so convincing that it was impossible to ignore them. Even when the plant had worked unsuccessfully for a month your directors believed that the difficulties were only temporary.

Amalgamation Proposal.

I will now turn to another most important question which was dealt with in the notice issued through the Press on the 25th of April last. I refer to the proposal to amalgamate with the Apex Mines, Limited, to liquidate the liabilities of your company, provide adequate working capital, to rectify the defects in the cyanide plant, to bring the capacity of the reduction plant up to forty thousand tons per month, and to continue effective development in both properties. As notified at the time, the services of Mr. C. D. Leslie, superintendent engineer to the Consolidated Goldfields, were secured to make a report and valuations on the assets of the two companies, in order to ascertain whether the amalgamation was a sound business proposition for both companies, and to arrive at terms that would be equitable to both. This report is now before you, and gives Mr. Leslie's views very clearly. You will notice that he considers that amalgamation would be in the best interests of both companies, and he sets forth a basis for the purchase of the assets of this company. He recommends, however, that in place of commencing crushing on a basis of 40,000 tons per month, a start should be made at the earliest possible moment on a basis of 30,000 tons per month, to be increased after the first year to 60,000 tons, and after the second to 70,000 tons per month. The scheme has had lengthy considration by the board of the Apex Company and their friends in London, but I regret to have to report that it has not been brought to a successful issue.

Debenture Issue.

There was certainly some difference of opinion as to what price should be paid to your company for its assets, but the main difficulty undoubtedly was the creation of so large an issue of debentures as would be required in order to carry out the proposed scheme in its entirety. This was looked on as a source of great danger to the Apex Company, in view of the depressed times which we are now passing through, and ultimately resulted in the proposals being dropped, more especially as it was felt that the acquisition by the Apex Company of reduction works was, at the present moment, a consideration secondary in a measure to the further opening up of their mine. It now therefore remains for us to find other means for raising funds to consolidate our existing liabilities and to finance the reorganisation of the cyanide works. I regret that since the suspension of the negotiations in connection with the proposed amalgamation the time at our disposal has been too short to allow of any concrete scheme being formulated and placed before you, but I can assure you that the board will lose no time and spare no effort in the matter, and any arrangement that can be made will be communicated to you at the earliest possible moment.

Mr. Leslie's Report.

Referring to Mr. Leslie's report, I think it desirable that remark should be made on what appears to be a discrepancy between the value of the ore reserves as stated from time to time in the company's reports and the value as set down by Mr. Leslie. Mr. Leslie estimates, including a certain tonnage partially developed, the average value of the total ore reserves at the date of his report on a milling basis was 5.9 dwts. per ton, whereas the figures which have been given you from time to time in the reports show that the average value on a milling basis of the ore developed over the same period was 6.43 dwts. per ton. The difference is accounted for by the following explanation. Mr. Leslie was asked "to report as to the payable ore reserves existing in both companies' grounds, on the basis of the mine sampling, subject to such checks as you think advisable, taken in conjunction with the values as per mine sampling met in the surrounding properties." It is evident that Mr. Leslie has discounted these values, whereas, of course, the values which are stated by us from time to time in the reports are the actual values as found in the mine. In dealing with the properties on a combined basis, Mr. Leslie makes the yield 5.281 dwts. and our calculations show that from the actual ore developed in the two mines concerned the average ought to be 3.23 dwts. In other words, owing to the fact that Mr. Leslie has discounted the values owing to his adhering strictly to the terms of reference, there is a difference between the yield which is shown by the following figures: Average grade of both mines, 25/6.40d.; Mr. Leslie's estimate, 22/2.72d.; difference, 3/3.68d. This difference represents the amount of revenue which we expect to recover in excess of Mr. Leslie's estimate if we adhere strictly to the value of the ore reserves as they stand, without taking into consideration the values in surrounding properties. In order to avoid misapprehension, I would assure shareholders that we have no reason to amend the estimates which have been made with regard to the value of your development and ore reserves as published. I now move the adoption of the report and accounts for the year ended 31st of December, 1911.

Mr. Black said: The chairman has put before you with unusual brevity the causes that have led to the position in which the company finds itself today. Now, gentlemen, the directors fully recognise the fiduciary capacity in which they stand towards shareholders. So much being acknowledged, it is but due to the members of the board that a further and more detailed explanation should be afforded shareholders. In my own case, I represent the holders of over 100,000 shares, and I need not say that it requires more than ordinary restraint to deal temperately with the cause of the deplorable condition in which the company is situated. When, in 1908, the Jumpers Company decided to participate in the reconstruction of the Benoni Company, the utmost precautions were taken by a careful technical examination of the underground workings of the Benoni Company, and I need not take up your time to-day by recapitulating how well satisfied we were with the certainty of success, given good management, to bring the company to the producing stage. In putting our money into the venture we made it a condition precedent that the then manager of the Jumpers Company, Mr. T. Kerr, should take charge of the mine, and in deference to the Anglo-French Exploration Company, Limited, who were the sponsors of the company, and the controlling house, as that name is used on these fields, Mr. E. J. Way, M.I.C.E., M.I.M.E., their own engineer, was to be installed as consulting engineer, more especially for the purpose of preparing estimates and plans, and supervising the erection of an up-to-date reduction plant. We thought that we were on safe ground when we limited this gentleman's appointment to a purely advisory one, as Mr. Kerr was more responsible directly to the board for the management of the mine.

Mine Payable.

So far as the mine is concerned, everything that we then believed about its payability has been confirmed by subsequent development and milling. The first estimate of November, 1908, to bring the ore reserves to 250,000 tons of payable ore, and to erect a plant on a basis of crushing 10,000 tons per month, was £120,750. The developments were so satisfactory to all concerned that it was decided to prepare a second estimate—that was a year later in November, 1909—to bring the ore reserves to 500,000 payable tons, and to erect a plant capable of dealing with 20,000 tons per month. Such reduction plant was to be ready by the 1st of October, 1910. The total estimate of expenditure prepared by the consulting engineer, amounted to £235,643, and, though it was calculated that the money in hand to that date would be insufficient, we were assured that an additional sum not exceeding £23,170 would be required. Here I might mention that by October, 1910, the mine manager had practically his 500,000 tons of payable ore ready; to be exact the tonnage was 463,000, and at the end of December, 1910—three months later—he reported to the board that he had 600,000 tons of payable ore developed.

Consulting Engineer's Plans.

Obviously the plans for the erection of the plant proceeded concurrently during the period of development; but the consulting engineer was not satisfied at that time to draft plans for a plant such as the other mines on these fields were utilising, but something far in advance was to be provided, and thus time was lost, while he was busy with what he considered were final experiments on a few unimportant details. The delay was very unsatisfactory to the board, and finally in May, 1910, when he was pressed to expedite his plans, the consulting engineer stated that, owing to the insufficiency of the data on the Way-Arbuckle process—on which he had spent a great deal of time and attention—it would be inadvisable to complete the plant until April, 1911. As a set-off, he pointed out a saving by the adoption of this process of £31,520, compared with the cost of an ordinary cyanide plant, also low working costs and high extraction. This set-off was quite imaginary, as his estimated cost of £30.173 reached a sum of £61,856 9s. 3d., which is approximately the cost of a modern decantation cyanide plant capable of treating 20,000 tons per month.

Alluring Proposition.

This promised saving of £31,520, together with other advantages, was naturally very alluring, and after fullest consideration, on the assurance of the consulting engineer that the board was running no risk whatever, the order for the plant was agreed to; but subsequent events showed that the installation of the Way-Arbuckle plant was the direct cause of the crushing stage of the company being delayed for fully one year, after the mine had been ready to supply the mill. Shareholders know but too well what the delay has cost the company in the first place, apart from the subsequent failure of the cyanide treatment plant. At about this time, the beginning of October, 1910, my colleagues and myself representing the Jumpers Company's interest on the board became very much concerned at the continual drain on the finances of the company, and also impatient at the probability of the producing stage not being reached within the estimated period. A third estimate was then prepared in December, 1910, as to what the financial position of the company would be at the end of September, 1911. It was found that the estimate of £235,643 prepared in 1909 was totally inadequate, that the required amount would be nearer £345,467, and that the available finances of the company would be exceeded by a sum of £88,000. This latter estimate was framed so that milling operations could start in September, 1911. So interminable were the delays, however added to the under-estimation of the consulting engineer, that the actual liability far exceeded the estimate, and instead of a debt of £88,000 by the time the mill started up the actual liability was approximately £185,000.

Vast Difference.

Briefly, by September, 1911, an expenditure of £424,000 had been incurred, as compared with the original estimate of some £235,643, and at the end of April, 1912, the total amount of money spent on the property since its reconstruction in 1908 is a sum of some £525,000; in this latter sum was included a sum of roughly £50,000, which was paid out of it to the creditors of the old Benoni and Chimes West. Assuming that the whole of the reduction plant had been a success, the estimates would have been exceeded by a further £97,000, in addition to the £88,000, the figure referred to above. All the promises held out to the board of the superiority of the Way-Arbuckle process have proved to be quite fallacious, and apart from the metallurgical side, it is generally recognised in technical circles on the Rand that the Way-Arbuckle cyanide plant, as designed for the Benoni, could not possibly have been a success. We were promised, as I have already stated, a treatment of sand and slime unsurpassed on these fields in some four to five hours, instead of six or seven days customary on the Rand, and the handling in the same plant of combined sand and slime. We were promised that the residue of the slime on mixed treatment of sand and slime would give mere traces of gold; well, as the combined treatment was an utter failure, we had no means of proving or disproving the ultimate value of the residues, for the slime of a value of 1.59 dwts. had to be dumped on the veld, and, approximately, some £14,000 worth of recoverable gold is now lying there. Sand and slime mixed were to have given a residue as low as .18 dwts.; what was the actual result? After six months of treatment of sands alone the theoretical extraction, though 77 per cent., returned in actual practice only 58 per cent., with residues of .7 dwts. I base all these figures on the returns as published and those furnished to the Government. Again, the running cost of the Way-Arbuckle cyanide treatment as designed by Mr. Way was so prohibitive that it was clearly proved to be economically a failure, apart from any comparison with the ordinary cyanide treatment. The greatest difficulty was experienced with the treatment cones, and, so far as the Way's mechanical screw is concerned, after several months of various experiments under actual working conditions, it was discarded as not only being an expensive piece of mechanism, but as quite useless for the purpose for which it was designed. As a matter of plain fact, we now know that the cones designed for the Benoni cyanide treatment plant could not have been put originally to sufficient tests of reliability to do the work that was claimed for them. Many of the estimates of equipment furnished to the board have been exceeded, and, as I have shown, in the cost of the cyanide treatment plant alone the difference of 105 per cent. is so extraordinary that I feel compelled to lay particular stress on it.

I say advisedly, with the fullest responsibility, that the company has been brought to its present pass primarily through the utter lack of judgment of its consulting engineer, whose advice has cost the shareholders much more than the mere recital of excess expenditure items. Had he any regard for his own reputation or that of his board, who relied on his estimates and personal assurances, he would never have risked the company's position by recommending the erection of the Way-Arbuckle plant. Look at it how we will, after an expenditure of some £152,000 on the crushing and reduction plants, the company is left with a cyanide treatment plant of which the greater portion must be scrapped, and replaced by one of the usual pattern, and at a cost of approximately £45,000. Such a state of affairs is unheard of, and for the good name of the Witwatersrand is, happily, an occurrence that is not likely to be easily repeated. Fortunately the mine itself remains unchanged, in our estimation, for at the beginning of the crushing operations the payable ore value was rated at 6.47 dwts., and at a re-estimation of values after the late closing down the payable developed tonnage value is returned at 6.44 dwts. The closing down of the mine was due, not to the financial position, because that could have been easily rectified, but to the inability to obtain any proper results from the payable grade of ore with the cyanide treatment plant erected by Mr. E. J. Way. The board gave him every opportunity of proving his cyanide plant in actual running over six months, and in the end he himself had to admit its complete failure. In a precis addressed to the board in March last, covering some thirty-one folios of typed foolscap, Mr. E. J. Way offers a defence for his recommendation of his plant in 1909. Well, gentlemen, let me draw a veil over this dossier; suffice it to say Mr. Way does not endeavour to exculpate himself.

Anglo-French Attacked.

That brings me to the position of the Anglo-French Exploration Co., Ltd., in its relation to this company. They were known all along as the controlling group of the company. They reconstructed it, and were quite ready to invite others to join them in doing so. They supplied the consulting engineer, the secretaries, and what is known as the central administration officials at Kleinfontein. They charged the company 1¼ per cent. commission on all surface capital expenditure, including excesses in the original estimates. They now make no secret of having disposed of their holding of shares in the company some eighteen months ago. Usually, the controlling groups on these fields have come to the assistance of their mines, when difficulties overtake them, but the Anglo-French Exploration are not influenced by such recondite considerations, and they affect, now that the Benoni shareholders have lost their money in proving the worthlessness of the Way-Arbuckle process, to have no moral responsibility towards shareholders who entrusted their interests to their keeping, and from whom they had every right to expect the utmost consideration as guardians of such interests. Their managing director in London, Mr. Henderson Clarke, arrived here a few weeks ago, and it became necessary to discuss the position of the Benoni Company's affairs with him. While he regretted exceedingly the failure of the cyanide plant, he urged that when his company in London heard of the proposal to instal the Way-Arbuckle process he warned his representatives here in Johannesburg not to indulge in costly experiments. The information, if correct, however valuable, was certainly not communicated to the Benoni board.

Callous Conduct Alleged.

Well, investors will know how to rate a mining house which deals in such a callous manner with enterprises in which they induce the public to subscribe, and then, having made their own profit, leave as derelicts for others to rescue. Before closing my remarks, I take this opportunity of expressing my acknowledgements to Sir George Farrar for his good offices in connection with the negotiations with the Apex Mines to arrive at a fair basis of amalgamation of the two properties. Sir George has stood loyally by the Benoni Company in his endeavours to arrive at a mutual and satisfactory arrangement for the fusion of the two properties, and his efforts have so far failed simply because he recognised that the Benoni board could not, with any regard to the interests of its shareholders, sacrifice their assets as lightly as the Anglo-French Exploration Co. desired. Sir George Farrar's firm, like the Jumpers Co., joined in the reconstruction of the Benoni Company with no idea of any share market manipulation. Our aim was to establish the company as a profitable producer and to afford a reasonable return on the investment. His attitude all along has been one of which the shareholders can be genuinely appreciative. In contrast with that of the Anglo-French Company, he has proved himself a friend indeed. I am sure that the shareholders of the Benoni Company have every reason to be indebted to him for the spontaneous services he rendered at a time when most urgently required.

Mr. Way Replies.

Mr. E. J. Way rose to reply. He said: I crave your permission, Mr. Chairman, if I am in order, to make a few remarks with regard to what Mr. Black has just said. If I remain silent with regard to these remarks, it may be thought that I acquiesce in them. Therefore, though I regret the circumstances which make it necessary for me to be, as it were, on my defence in this matter, I think a few plain facts from my point of view, in contradistinction to that of Mr. Black's, will permit of a more reasonable and fairer judgment being formed of the general position. I am well aware that, as a rule, it is the custom here for the consulting engineer to be held responsible for whatever takes place on the mines under his control; but it must not be forgotten that, as is but fair and reasonable under such conditions, his advice on technical matters is accepted without question by the board of directors of the mines concerned. In the case of Benoni, however, it has been very different. I have never had control of the management, and in matters of the gravest importance my advice has not been taken. Particularly was this the case with regard to the limit of payability in the mine, which I advised the board to assess on a milling basis of 5 dwts., but which a majority of the directors, in spite of the high working costs then ruling, insisted on assessing on a basis of 4½ dwts. I also had to point out to the board that development results were far from satisfactory during the last two quarters before development operations were curtailed, and I do not think that the position thus entailed received the consideration it merited. Owing to the financial position, however, development had unfortunately to be practically stopped before any information could be gained on this point, so that whether or not an improvement would have taken place, as the result of further development operations, has never been ascertained.

Difference of Opinion.

Owing to the difference of opinion on this and other points, between myself and a certain section of the board, I seriously contemplated resignation, but owing to the fact that the plant was then in course of erection, and also to the fact that I was very largely responsible for its arrangement and design, I decided not to take this step. With regard to the erection of the plant, it was quite well known by the board that the money at the disposal of the company would not be sufficient, by a very large amount, to allow of the erection of the plant as originally designed, and I had accordingly to do my best to cut the garment according to the cloth placed at my disposal. For this reason, that part of the plant which has given trouble, namely, the cyanide works, had to be cut down by me in every direction in order to meet the financial position. The mill, as a mill, could not be cut down. The original scheme with regard to the secondary treatment allowed for four settling cones in each section, but owing to the financial position only three cones were erected in each section. The original scheme also allowed for a stand-by compressor for the agitation plant, which was not installed, and for other refinements and necessary adjuncts, which also had to be omitted or cut down. All these things assisted in adding to the trouble which was experienced in starting up the plant.

No Autocratic Innovation.

With regard to the design of the cyanide works, this was not an innovation autocratically decided on by myself, nor, may I state, have I any pecuniary interest whatever in the patents covering the process. The erection of the plant was only resolved on after the most mature and careful consideration, and after consultation with certain of the leading metallurgists and mechanical engineers on these fields, who endorsed my views with regard to the potentialities of the plant. As I have just stated, I took no autocratic position with regard to the installation of this particular plant by the Benoni Company. Though the decision with regard to the erection of the plant was only come to after the most careful consideration and discussion of the whole question with the Benoni board, it would appear that a certain section of the board now wish to place the whole of the blame for the difficulties which have occurred on my shoulders. This, I admit, they would have been perfectly justified in doing had it been possible for me to force the erection of the plant on the board without their consent. This, however, was not possible, and as a matter of fact, every section of the board was kept fully acquainted from the very inception of the plant with every detail in connection with it and with all the reasons which ultimately led me to advise the adoption of the plant. These reasons, every member of the board agreed with me, fully justified the erection of the plant, and in those reasons every one of us, without exception, believed.

Who is to Blame?

It is significant that only one section of the board has levelled this attack on me. Surely, if I am to blame, Mr. Black is, to a certain extent at least, also to blame. And as, with a full knowledge of the whole position, he agreed with me that the plant ought to be erected, it is certainly only equitable and right that he should acknowledge the position, and not try, as he has attempted to do to-day, to shirk all responsibility. Though a certain section of the Benoni plant has been a partial failure, I am still of the opinion that the ideas embodied in this plant will ultimately prove a great success. In this connection I would remind you that all the chief innovations in the past in the metallurgical practice on these fields have been faced with prejudice and opposition before being finally adopted. This was the case even in the cyanide treatment of Rand ores, as some of the leading engineers and metallurgists on the Rand at the time of its introduction opposed it bitterly, while, to come to more recent times, the keen fight which has been waged round the question of the economics of the secondary grinding by tube mills, a fight which has even yet not been finally settled to the satisfaction of everyone, will be well within your remembrance. Contrast with all this the fact that the Benoni plant, embodying as it does no more revolutionary ideas than either of the above-mentioned innovations, has actually been started, condemned, and shut down in five months' time.

Inventor's Ideas.

Reference has been made to the fact that the inventor's ideas were not carried out in their entirety. It is useless on an occasion like this to go into minute technical details, but I have to admit that in one particular the inventor's ideas were departed from in the plant originally erected. I refer, as most of you are doubtless aware, to the stirrers in the cones, which, owing to their failure from a mechanical point of view on another plant, were not included in the Benoni plant. However, when our difficulties first showed themselves these stirrers were at once fitted to the settling cones under the personal supervision of Mr. Arbuckle himself, who, at my request, spent a considerable time with me on the plant in seeing that his ideas were carried out in the most minute particular. As a matter of fact, Mr. Arbuckle and I spent practically night and day on the plant during the New Year holidays, and everything was then done to carry out his wishes, with the result that Mr. Arbuckle, in the presence of witnesses, stated that he was fully satisfied with what had been done. It was only when we found that, in spite of the introduction of the stirrers in the cones, the screws did not carry out their functions that I reported to the Board that the only policy for the time being was to, temporarily at least, abandon the use of the screws and to proceed to deal with the thickened slime by means of the centrifugal pumps, which had already been installed.

Mr. Arbuckle's Position.

I have no wish to cast any reflections whatever on Mr. Arbuckle; but, in fairness to myself, I am compelled to say that, though Mr. Arbuckle was consulted in every detail, and though he knew full well what was at stake with regard to his invention, Mr. Arbuckle never once visited the plant during its erection period, and, even when it was started, it was only on my most urgent personal application that he consented to do so. Your manager, Mr. Kerr, was appointed at the special request of the Jumpers representatives on the Benoni Board, and every head of a department, on the Benoni mine itself, was personally selected and appointed by him. The great majority of these men were entirely unknown to me previous to their appointment, and, added to this fact, I am given to understand that the man chosen by your manager to take charge of the whole reduction works, in spite of the fact that an entirely new design of cyanide plant had to be got into running order, had never in his previous experiecce had full charge of either a tubemill plant or of a cyanide plant of any description. Thus I started with a handicap which has worked adversely to the success of the plant from the very commencement of operations. There has been, as it were, a dual technical control, and in matters of the very gravest importance my advice has not been asked by the management and, if tendered, not accepted. When the plant commenced running the usual conditioning had to take place, and with regard to this, I made a statement to the Board on the 2nd of February pointing out that I anticipated that, within the first four or five months of running, at least 2,600 ozs. of gold would be absorbed in the works before the usual returns could be expected. At the end of April the management took from the works, to within a few ounces, the gold actually called for for that month. The final clean-up has yielded between 1,800 and 1,900 ozs. of fine gold, actually obtained, and, as I estimate that there are at least 600 ozs. still remaining on the copper plates at the present time, it would appear that the total gold absorbed in conditioning the plant amounted to approximately 2,500 ozs., a very close appropriation indeed to my original estimate of 2,600 ozs. A further small amount of gold has since been obtained.

No Responsibility for Handling.

Owing to the difficulties with the cyanide plant is was found impossible, from the want of the extra settling cones which had been allowed for in the original design, but which had had to be cut out owing to the financial position, to deal with the slimes successfully. It was, therefore, decided to let the slimes stand over and to store them for future treatment. In spite of all these difficulties, however, the total actual extraction on the plates and on the sands and slimes, which actually came in contact with the cyanide solution in the ordinary process of handling, showed a net total of 89 per cent., so that had it been possible to get the plant into proper working order, it is more than probable that the extraction would have been most satisfactory. I have no hesitation in saying that, though I take full responsibility for the design of the plant and have in fact done so from the commencement, I can take no responsibility whatever for the way in which it has been handled, and I have repeatedly called the attention of the Board to this fact. In consequence of the failure of the cyanide plant to yield the gold called for, a failure, which, as I have pointed out, was only apparent and not real, as it was owing to the continual absorption of gold during the conditioning of the plant, a proposition was made to the Anglo-French company to take over the surface plant and run it under certain specified conditions.

Legal Opinion Taken.

Legal opinion was taken on the question of the Anglo-French Company's liability with regard to the failure of the cyanide plant, with the result that the Anglo-French Company were declared to have no legal responsibility whatever for the success or failure of the plant. As this was the case, I was prepared personally to take over the running of the plant; but nothing at that time came of my suggestion that I should do so. The question of my taking over the running of the plant was, however, brought forward officially and discussed on the 24th of April, at the time when the shutting down of the plant was under consideration. I pointed out to the board that I should naturally, if I took charge of the plant, wish to employ my own staff and men from top to bottom. If I did this it would be necessary to give the new staff a little time to become acquainted with all details and to have a fair opportunity of getting the plant into proper working order. To enable this to be done it would have been necessary to find some means for easing the then financial position, and, as this was apparently impossible, I could not see my way to taking over the running of the plant at that time.

Question of Cost.

Coming now to the question both of the cost of the plant and of the estimated cost as compared with the actual cost. No endeavour has been made to conceal the fact that the estimates were exceeded; but it is only fair to the construction department to explain that the greater part of the excess expenditure over estimate was due to circumstances over which that department had no control. The original estimates were based on trial tenders; but when actual orders were placed it was found that in every case contractors asked for more. In addition to this, very serious delays took place in delivery of the machinery, in some cases amounting to as much as nine months from the guaranteed date of delivery. Such delays inevitably increase capital expenditure, as all expenditure on keeping in the mine unwaterer and on such other work as is necessary to keep everything in readiness for starting up, together with the usual standing charges, has of necessity to be charged to capital account. At the time of the closing down of the plant working costs were gradually being brought down to a normal level, and, as far as the reduction costs are concerned, there is no doubt in my mind that they would ultimately have been as reasonable as on any other plant of a similar capacity on these fields; but to expect that, from the very starting of operations, costs would be normal, a thing which has never before happened, and never will happen, is to expect the impossible.

Mr. Way's Contention.

Finally, I maintain without any hesitation that, with the exception of the Arbuckle screws, every portion of the cyanide plant could have been made to carry out its work satisfactorily. For reasons which I have before stated it is improbable that the cyanide plant would have been able to treat successfully up to the full capacity of 20,000 tons per month, for which it was originally designed. That however, was no fault of the general design, as the capacity had been, as I have already pointed out, cut down purely for financial reasons. The result of the final clean-up, in my opinion, fully bears out my statements; but, unfortunately, it was impossible to convince a certain section of the board concerning the amount of gold that would be absorbed in conditioning the works, with the result that they thought that the cyanide plant was doing far worse than it was actually doing, and for this and other reasons it was finally decided to close down the mine. The personal attack made on me by Mr. Black is, under all the circumstances, entirely unjustified, and my only reason for refuting that attack in public is because it has been made in public.

Mr. O'K. Webber and the Staff.

Mr. O'K. Webber commented on the statements of the last speaker, criticising his explanations in regard to technical details. Mr. Arbuckle, he observed, apparently expressed reluctance to examine the working of the equipment. He (Mr. Webber) could understand it, as that gentleman had led them to believe the failure of the process was due to the fact that some essential parts were designed by Mr. Way. Some reflections on the staff had been made by Mr. Way. As no member of the staff was there to justify himself, he thought it only fair that something should be said on their behalf.

Sir George Farrar.

Sir George Farrar said he was not there to accentuate difficulties, but he was there if possible to try and find a way out of their difficulties. He was afraid, when controversies were entered upon by experts, that such controversies might continue a very long time; but there was not the slightest doubt that in this instance an unfortunate mistake had been made. He wanted to be perfectly frank with shareholders, because it was a very important meeting for them; and what shareholders ought to know was, what prospects there were of putting the company in a good position. He himself had, at the annual meeting of the Apex Company the previous day, detailed the whole of their negotiations, and he thought it only fair to shareholders to be equally frank with them that day. No doubt a good deal of what he said at the Apex meeting referred to the Benoni, and practically they would find, as the result of his efforts yesterday, that he came up against a blank wall, and that blank wall was the Anglo-French Exploration Company's board in London. The board of the Benoni Company in Johannesburg had their ideas; and the board of the Anglo-French Exploration Company in London had their ideas, to which at all times they were prepared to pay the greatest attention and consideration. The chairman had said that the board hoped to be in a position to lay a financial scheme before the company, and no doubt shareholders would ask themselves, if the amalgamation did not take place, what was proposed to be done in regard to the company; and that was the position he thought it only right and fair he should deal with.

Willing to Co-operate.

When he came back from England, he regretted to say he saw no prospect of the Benoni plant being successful. An initial mistake had been made. It was no good casting blame in one direction or the other; the great thing was to get out of the difficulty and put the company on a sound footing. The board called in expert advice, one of the best metallurgical men here—namely, Mr. Bosqui—and he advised reconstruction of the plant; and evidently that was the advice—in spite of what had been said—that shareholders had to face. On his return from England about March, he went to Colonel Dalrymple and told him that an unfortunate mistake had been made, and he (Sir George Farrar) must say he had the greatest co-operation from Colonel Dalrymple. He (Sir George) said: "The plant is a failure. The way out of the difficulty is to get to work. Standing charges and interest are running on; we must do our utmost to get the company going, so as to make up the loss to shareholders." That seemd the practical way out of the difficulty. He added, when he spoke to Colonel Dalrymple: "We have to find out what money is necessary, because the longer we go on our debt is only increasing." He pointed out that the Anglo-French were the controlling section. Mr. Black had referred to selling shares. Well, next to the Jumpers Company, he himself was the largest shareholder. He found that in 1911 his firm had increased their holding by 60 per cent., and he had not sold a share since March, 1910. He told Colonel Dalrymple that he was prepared to co-operate with him and put up a substantial amount and go himself into the scheme, and it was no good crying over spilt milk. He must say that Colonel Dalrymple co-operated with him in every possible way; but at the end of a month they got no further forward and no definite answer from the Anglo-French in London as to what they were prepared to do (as controllers of the company) in a very difficult position. As they were unable to get any further in this direction, he went on to the amalgamation scheme—which he had dealt with at the Apex meeting the previous day—to see if they could not make progress in another direction. His desire was to see Benoni put on a proper financial footing. He said that day, as he said to Colonel Dalrymple as far back as March last, that he was prepared to put up a substantial amount of money to help the company forward. (Hear, hear.) But he was not prepared to take over the obligations of the Anglo-French Exploration Company, as they had obligations to this company. He had talked to Mr. Henderson Clarke, their London managing director, just the same. He (Sir

George) had said: "It is an unfortunate position. The consulting engineer, acting in best faith, put up a plant which has failed. The controlling house has certain moral obligations, and your moral obligation is to put your hand into your pocket and co-operate with other large shareholders and put the company on a proper footing." And he (Sir George) hoped that at the eleventh hour the Anglo-French Exploration Company in London would come forward to do that.

Practical Offer.

He had done his best for the amalgamation, and had not succeeded. He was still prepared to put up a substantial amount and co-operate in order to get this company on a sound footing. It was only fair to shareholders and to himself that they should know the exact position, which was that the Anglo-French Exploration Company in London must come forward; indeed, he had hoped that failing the amalgamation, the chairman would have been able to say to-day his corporation was prepared to come forward and co-operate with other shareholders in order to make a success of any reconstruction, so that shareholders could go home feeling that the finances of the company were to be put on a sound footing. He thought Mr. Kerr a most reliable mine manager. (Hear, hear.) Mr. Kerr had opened the mine, he (Sir George) thought, exceedingly well, and had been an excellent servant of the company. There had been differences of opinion as to the pay-limit—4.5 or 5—but differences of opinion on such matters among mining men were not uncommon. (Laughter.) He repeated he was prepared at any time to come forward with a substantial amount towards helping to put the Benoni Company in a sound financial position, but the Anglo-French Exploration Company in London must come forward, and must undertake the moral obligations that existed to-day towards the shareholders in the company. It appeared impossible for any companies to secede from the group—nor was there, he hoped, any intention in this direction—so interwoven were the interests of the group. Colonel Dalrymple knew this, and knew the difficulties of the position. Whether the amalgamation went through or not, the Benoni, he believed, was a good property, and one which, he believed, would pay. If all co-operated they could get over their difficulties. He had spoken plainly, and he had told them everything since he had looked into the affairs of the company last March. (Applause.)

Mr. Haley and Patents.

Mr. Haley said that was a most unfortunate meeting. There was no middle course—they had either to use the machine or not. All patents were speculative; he thought about one in a thousand turned out a success. Yet the Anglo-French took the thousand to one chance and landed the poor shareholders—where? Shares dropped from 37s. 6d. to as low as 3s. 9d. "Now," concluded Mr. Haley, "I should like to know what the Anglo-French are going to do. That's a question I want answering. I am prepared to put up a small amount of money to help the Benoni on its way."

Mr. Black Again.

Mr. Black said it was most distasteful to him to recriminate; he recognised, with all shareholders, the uselessness of that. After all, there was something due to the shareholders who put money into the concern. He was quite prepared to accept Mr. Leslie's values as far as they related to neighbouring properties; but as to the Benoni Company every shareholder must have noticed that the ore values were given as 6.47. The greatest living authority on mine valuation had laid down the dictum that where there was any difference between rival engineers or managers as to payability the decision then had to be with the mill. The mill had decided, giving 6.3 dwts. But, whatever differences of opinion there might be as to payability, what had that to do with the failure of the cyanide plant? Mr. Bosqui's report, in his (the speaker's) opinion, damned the plant. With regard to the Anglo-French Exploration Co. Mr. Black added that he shared the hopes of Sir George Farrar and Mr. Haley: but he (Mr. Black) could also "call spirits from the vasty deep." Would they come?

Colonel Dalrymple, replying to the discussion, said: I think there have been no specific questions asked such as are customary at meetings like this, but still there has been a general discussion.

Mr. Haley: Excuse me, Mr. Chairman, I asked a very explicit question. I wanted to know what the Anglo-French Exploration Company, Limited, were going to do.

Colonel Dalrymple: Yes, you are quite right, Mr. Haley, I apologise for not remembering. Now the criticism has undoubtedly centred round the Anglo-French Exploration Company, Limited, and more particularly, Mr. Way—Mr. Way from the technical aspect, from the fact that the equipment which he has put in has not been a success, and also with regard to the Anglo-French Company that they have the responsibility to rectify and put the equipment in order. Now, there has been a good deal of talk this afternoon on the question of the "controlling house," but I say, gentlemen, that any company that is located in the Anglo-French offices is controlled by their respective boards of directors. The Anglo-French do not sit with the control of any board. They have never asked for it, and they did not expect it. Take the instance of the Benoni Consolidated Company. On its reconstruction, that is, when the Chimes West and the Benoni Company were put together, I do not think the Anglo-French Company were in any way responsible for the Jumpers Company taking a financial interest in that reconstruction. In my speech, I think I set forth who were participating in the guarantees, and more or less the ratio of these guarantees. The Board was divided up, and it was agreed at that time that the Jumpers Company would have two seats on that board Messrs. Farrar Brothers would have two seats, and the Anglo-French would have two seats, thus constituting a board of six directors. It was arranged that the manager of the Jumpers Company should be the manager. It was arranged that Mr. E. J. Way, the engineer of the Anglo-French Company, should be asked, and that his services should be handed over to the Benoni Company in the ordinary way that these engineerships are done; that is, he was seconded for that work, and he became the official of that company for the work he had to carry out.

Controlling House.

With regard to the "controlling house" that has been a good deal spoken about this afternoon, and of that group in the past, it is to my knowledge and belief what is known as the Farrar-Anglo-French group, and I am not aware that any change has taken place. With regard to the association between Messrs. Farrar Brothers and the Anglo-French Exploration Company, I think that the position is this, that Mr. Way, when he was taken from the New Kleinfontein as general manager, and brought into town, Sir George Farrar was a party to that arrangement; and also, that in all business which goes through his office (Mr. Way's), Sir George Farrar has a right to claim a very material percentage of such business, and of all things that Mr. Way reports on. That was part of the arrangement. Therefore, I cannot, on behalf of the Anglo-French Exploration Company, Limited, in London—it would not be right for me to admit that the Anglo-French are what is generally known as the controlling house absolutely of the Benoni Company. It is true that the secretaryship is in this office, but that does not constitute control. There are six directors, and you have only got two directors of the Anglo-French on that board. Where does the control come in? You have the case of the pay limit of the ore reserves. This matter has been disputed, and, of course, there is a divergence on this question of ore reserves. There always is. The question of the rise or fall of 1s. per ton in working costs makes a great difference; but the fact remains that a report was made by Mr. Way that the payable value of the ore reserves should be increased to 5 dwts.; but it is just as well to hear the board minute on this. I only want also, like Sir George Farrar, to be perfectly straight and plain. There has never been anything more in my mind, and there is not going to be anything else on this point.

At this stage the secretary read the minute of directors dealing with the question of the ore reserves, and the report of the consulting engineer for the year 1912 was handed in to the secretary, from which certain parts were read dealing with the ore reserves.

Debenture Danger.

Colonel Dalrymple, continuing, said: Now, gentlemen, this is the whole story about the ore reserves, so you can form your own conclusions about it. Touching on this question of Anglo-French Exploration Company, Limited, not having up to date come forward to assist in any financial scheme, I will deal simply with the question of the financing of the Benoni Consolidated Gold Mines, Ltd., by itself, because, I think, at yesterday's meeting of the Apex Mines, Ltd., I, as clearly as possible and to the best of my capacity, showed the anxiety of the Anglo-French Exploration Co., Ltd., London, and their lack of desire at the present time to bring about such amalgamation, more particularly from the financial aspects, where in times like these, it entailed such a large debenture issue, the earning capacity of the company being confined to the coal section, and that from gold there would be no possibility of much being done in regard to profits for some time to come. Hence the risk that the Apex Company might fall into the hands of the debenture holders. Now, with regard to the financing of Benoni by itself, unfortunately—and I regret to say it there has not been that unanimity in bad times in connection with this company which the gravity of the situation deserved. When it was found that the equipment was not coming out satisfactorily, there was a combination of the Farrar section and the Jumpers section of the board, who made an effort to locate absolute financial and moral responsibility for the failure of this equipment on to the Anglo-French Exploration Co., Ltd. I refer to a certain letter which was written by them. Legal opinion was also taken. Then certain notes were put in by a member of the board, which flavoured very much of imputations of mala fides on the Anglo-French Exploration Co., Ltd. Now, gentlemen, we, as representing the Anglo-French Exploration Co., Ltd., locally were prepared to go a very long way in the matter of these imputations, because we know perfectly well that when difficulties arise there is a great deal of freedom of speech—a great deal of latitude of speech has to be allowed for—and I think I allowed for a great deal at these meetings.

Making a Scapegoat.

When this information got to London as to the attitude which was being taken, that is, for practical purposes, to bring it down to a point, to make a scapegoat of the Anglo-French Exploration Company, Limited, my board in London took exception, and used the expression that it was the first time that any such thing had been done on these fields, and it was highly improper, and they would probably have welcomed any lawsuit to show that there was no mala fides on the part of the Anglo-French Exploration Company, Limited, in any shape or form. Gentlemen, when you see peculiar atmosphere which prevailed, you can no doubt recognise the difficulties which have intervened. I have done my utmost in the interests of the shareholders of this company to get things put right. Personally, I feel a moral responsibility, sitting here as I do as acting chairman, for you have no chairman at the present time. I have done my best, but they are so incensed in London at the efforts made to saddle the whole of the responsibility on to them that it has been more than I can do to get them to put up money at the present time; but as far as I am concerned, I shall not feel satisfied in my own mind until this plant has been put in such a position as to give this company a reasonable show, for I feel sure it has not had a reasonable show in the past in any way, and I perfectly admit it.

Financing the Benoni Mine.

Now, Mr. Haley, I am not in a position to say to you what the Anglo-French Exploration Co., Ltd., are prepared to do in regard to financing the Benoni Consolidated Gold Mines, Ltd. The Anglo-French Exploration Co., Ltd., came forward some time ago, along with the others, and found a sum up to about ££25,000. At that time they were prepared to find a little more, but that was the total amount that was agreed on between the Jumpers Gold Mining Company, Limited, Messrs. Farrar Brothers and the Anglo-French Exploration Company, Ltd. In accordance with Mr. Bosqui's report I think that a sum of forty odd thousand pounds was necessary to put the plant in order and to get everything going and meet expenses until the cyanide plant could be reconstructed. It appeared that we required a sum of £75,000.

Mr. Black: "In all."

Colonel Dalrymple: In all we required £75,000; that is to provide for the renovation of the equipment and make it effective. Sir George Farrar has stated that he, at this juncture, is prepared to help the Benoni Company. Well, I think shareholders have every reason to be grateful to Sir George Farrar. I am not aware that a distinct offer for the financing of the Benoni Consolidated Gold Mines, Limited, alone was ever agreed to; that is, that there would have been co-operation and cohesion between Farrar Brothers, the Jumpers Gold Mining Company, Ltd., and the Anglo-French Exploration Company, Ltd., in putting up a substantial sum; I am not aware of it. We certainly have fought hard on the amalgamation question, but to put up further money for the Benoni Consolidated Gold Mines, Ltd., I am not aware that that reached any acute stage. It was considered, and then the amalgamation question came up, and that seemed to be more attractive to all of us than to put up an amount of £75,000, which would result in the Benoni Company having unsecured liabilities of £276,000.

Most Regrettable.

Gentlemen, the whole thing is most regrettable in every way, but I am not looking for scapegoats, and I think an effort has been made to find scapegoats. I say that as far as Mr. Way is concerned I don't think that he for a moment ever contemplated failure from the Arbuckle process. The board were guided by him, and the board must take its responsibility. We are directly responsible to shareholders, and we must accept the responsibility. It is no use going for Mr. Way, who is engineer, or who as the technical man has made his mistake; it is done, and he cannot help us further. I do not think I can say any more. I think, as far as individual shareholders are concerned, going outside the representation through the board of directors, I think they have been exceedingly patient, more than patient, and I am surprised that a great deal more has not been said by the individual shareholders who hold their thousand, or two thousand, shares. I am surprised that more has not been said by them. It has been a most trying business, and the board of directors during the last nine months have had it constantly. It has been nothing but a constant strain from one week's end to the other, and, of course, in ordinary times, as has been done in connection with other mistakes in equipment elsewhere, it might have been rectified. In times like these, where money is tight, and when the veneer might be said to be rubbed off everything exposed, the difficulty is to get money. It is most regrettable in every way. I have nothing more to say at the present time. I have no doubt that the board will be meeting shortly, and I will continue to impress on the Anglo-French Exploration Company, Ltd., London, the necessity of giving a hand at this juncture. I do not think there is any necessity to keep the meeting any longer.

Another Word from Sir George.

Sir George Farrar: I should like to say one word, sir. I think you misunderstand. There has never been any desire, to use your own words, to saddle the Anglo-French Exploration Company, Ltd., with the whole of this responsibility. I mean that I think that the offer I made shows that, as far as I am concerned, and my representatives on the board, we have always been prepared to accept our responsibility by coming forward to help this company through its financial difficulties, so that I would correct you by saying that there has never been any attempt whatever to saddle the whole of the responsibility on the Anglo-French Exploration Company, Ltd.; and I would also correct you in this way—I never made a statement except on the facts of the case, and all that I can say is that the whole of the March negotiations took place between yourself and myself and my brother in London as to getting the Anglo-French Exploration Company, Ltd., in London to agree to a scheme as to putting the company in a better financial position. As regards Mr. Way, as far as I am concerned, I know the difficulties of engineering. I know in putting up this plant he was acting in the best interests of the company. It has been an unfortunate mistake, and I think it has been a mistake for which no one can get out of responsibility, because, after all, we have, of course, a technical adviser and he has to judge. As far as I am concerned, I wish to say two things: (1) There was no question of saddling the Anglo-French Exploration Company, Ltd., with the whole of this responsibility, nor, as far as I am concerned, has there been any attempt to saddle the whole of the responsibility on Mr. Way. That latter point I want to make perfectly clear. In regard to the Jumpers Company directors in contesting the legal position, I would point out that they were in a dual fiduciary position to you, and, therefore, a fiduciary position to their own shareholders, and all through this business they have been in a very difficult position—a position with which I sincerely sympathise.

Colonel Dalrymple: With regard to what has been said just now, I would simply say that the letter received from the Jumpers Company was not only signed by the Jumpers Company, but we have the signatories here.

The chairman was asked what the letter was all about, and, in reply, stated it was in regard to the question of fixing responsibility and then eventually taking legal opinion with the view to saddling the Anglo-French Exploration Company, Ltd., with the whole of the responsibility. "I am absolutely correct in what I say on this paint," he said, "and I stick to it. There is no use twisting in regard to this business."

Mr. Black: There was no implication at all of mala fides, and I think, Mr. Chairman, that you had better close the meeting. Do not let us read any more letters, or some letters might be read here, and some of them might be very unpleasant.

The Chairman: I shall be delighted to have any more letters read, but if not, that concludes the business.

The appointment of Mr. C. R. Pinder as a director in place of Sir George Farrar, resigned, was confirmed, and Messrs. G. W. Higgins and C. R. Pinder were then re-elected to the directorate.

Messrs. C. L. Andersson and Company were reappointed auditors.

TRANSVAAL LANDS.

Mining Interests Reviewed.

Mr. H. C. Boyd's Speech.

The seventeenth annual general meeting of the Transvaal Consolidated Land and Exploration Company, Ltd., was held in the board-room, Corner House, Mr. H. C. Boyd was in the chair, and among those present were Messrs. S. Marks, M.L.C., F. W. Baxter, H. Daniel, E. Rothschild, C. Meintjes, J. Jeppe, E. T. Bourke, J. A. van der Byl, A. A. G. Gill, H. Eckstein, and the secretary, Mr. W. E. S. Lewis, representing 39,892 shares out of an issued capital of 971,214.

The Chairman, in moving the adoption of the report and accounts, said inter alia. As you are aware this meeting has stood adjourned till this month in order that shareholders might have the fullest opportunity of perusing the reports and accounts for the year ended 31st December, 1911, before giving their proxies for representation at the meeting. A special meeting of shareholders has been called to consider the advisability of altering the articles of association so as to permit of the ordinary annual meetings being held each year about this time. As the information regarding the affairs of the company will, as far as possible, be brought up to date at these meetings, the board has decided not to issue, in future, the half-yearly report per 30th June. The fullest information regarding the past year's work of the Company is given in the reports and accounts now before you, but as virtually half a year has elapsed since the period with which they deal, the opportunity will now be taken to report on the latest developments in regard to the chief matters of interest.

Survey Completed.

It is satisfactory to be able to record that the survey of the whole of our farms has now been completed, the final result being that there is a substantial increase in the acreage as compared with the original estimate of the area of the farms, now owned by the company at the official Government inspection before the War. At the close of the year we owned full rights over 3.368,730 acres and mineral rights over 67,041 acres. As is stated in the report, only one farm was sold during 1911, but this year the surface rights of five farms have been disposed of at a substantial profit. As usual full mineral rights have been retained in every case, and the proceeds of the sales have been written off property account. It may be pointed out here that there is a decided tendency for land generally to appreciate in value. The changes which have taken place during the past year in the property account are detailed in the report, resulting in a net increase of £8,030 15s. 5d. This year in addition to the above sales of farms only minor sales of town properties have taken place. The profit earned by the Braamfontein Company may be considered to be satisfactory. A fair demand still continues for building lots, but generally speaking, building loans are necessary in order to effect sales. During the current year the Braamfontein Company has somewhat restricted the granting of such loans and sales have in consequence been adversely affected. The company has now, however, decided to renew the granting of loans in approved cases.

Discovery of Tin.

The throwing open of a large number of our farms for public prospecting, of which mention has been made on previous occasions, resulted in discoveries of tin being reported during the past year in respect of four farms in the south-east of the Waterberg district. The Government has since notified us that a genuine discovery has been made in respect of two of these farms, Mutue Fides, No. 1844, and Tygerpad, No. 2300. The discoverer is, in consequence, entitled to the award offered by the company, namely, an area of 700 yards square, in respect of which a tributing agreement will be entered into on mutually advantageous terms between the company and the discoverer. Our representative has recently visited the scene of the discovery and is examining the remaining portions of these farms and other farms in the immediate neighbourhood. Though a certain amount of high grade ore has already been mined by the discoverer, but little is yet known as to the possibility of this discovery proving of permanent importance.

Unimproved Farms.

It is still a matter of difficulty to obtain responsible tenants for unimproved farms in the northern districts, where practically the whole of this company's available land is situated, in spite of the policy which is sedulously pursued of offering genuinely attractive terms to those likely to make successful pioneer farmers. The work is, however, quietly progressing, and small communities of farmers are becoming established in localities hitherto neglected for farming purposes. As the land in the more settled parts of the Union becomes more difficult to obtain, the number of our farms which will be beneficially occupied will undoubtedly increase. During 1911 ten farms which had not previously been occupied were leased, and almost an equal number have been let during the current half-year.

Cattle Breeding.

The land manager deals in some detail with our activities in connection with the development of our landed property. While these, in some cases, have failed to yield directly beneficial results, they have materially assisted in opening up the sections of the country in which we are mainly interested. The results from the farming of sheep in the northern districts have been, as has been reported on previous occasions, very disappointing, but on the other hand, as you will see from Captain Madge's report, the breeding of cattle has proved a genuine success, and it is to the latter that our operations in stock farming will in future be confined. There is no doubt that cattle ranching will prove to be one of the main factors in the development of the Northern Transvaal, and it is therefore very satisfactory to note that the menace of the spread of East Coast fever has been considerably diminished in this Province. The ostrich farm at Rondebochje is fulfilling the expectations which led to its establishment, and is bound to attract favourable attention to the district in which it is situated. The anticipation of a satisfactory breeding season has been realised, and one hundred and sixteen chicks have been successfully reared. There are, at present, two hundred and thirty ostriches in all on the farm. Perhaps the most satisfactory feature in connection with this enterprise is the good quality of the feathers grown, which is a practical proof of the suitability of the locality for this class of farming.

Cotton Growing.

Owing to the drought little progress was made during the past season with the cotton-growing experiments which are being carried out in conjunction with the Government on our Blaauwberg block of farms in the Zoutpansberg district, but it is satisfactory to note that the results of the previous year were considered by the Government expert to indicate great possibilities for the successful development of this industry. The experiments, which so far have only been carried out on a small scale, are being continued. Work is progressing in regard to the establishment of plantations of trees. The plantation at Holfontein now covers 265 acres, that at Groenfontein 120 acres, and at Pan about 195 acres. These areas are well established, and the trees, from recent inspection, are seen to be showing satisfactory growth. I would draw your special attention to, and endorse Captain Madge's remarks regarding the recently proposed legislation on the occupation of land by natives. Fortunately the Bill dealing with this matter has been withdrawn.

Prospecting Operations.

Expenditure on capital account amounted to £59,309, the largest individual amount being £21,752 15s. 9d., expended at the Groenfontein Tin Mine, the bulk of which was in connection with the hydraulicing plant referred to in this and previous reports. £32,933 13s. 9d. was expended on various mineral properties in course of development, the company's interest in which is detailed in the directors' report. In addition, £8,150 10s. 9d. was spent in general prospecting of the company's own farms and in examining and testing other properties. Mr. Garrard reports fully on the past year's work in connection with all this expenditure, and it only remains to amplify this information in view of later developments.

Fairview Claims.

The Fairview (T.C.L.) Limited, which has acquired the Fairview claims in the Barberton district, has a capital of £45,000 in £1 shares, in which our company owns 26,250 shares. Since the beginning of the year, 1,092 feet of driving, sinking, raising and crosscutting have been effected, principally with a view to preparing the mine for stoping, and it is at present practically ready to supply the mill, which is now on order. The reduction plant will have an estimated capacity of 1,500 tons per month, and should be working by the end of October. Meanwhile, development work has been practically suspended pending the completion of this plant. Full details are given in the engineer's report of the development to the close of the year, and the prospcts of this small mine are decidedly favourable.

Mount Morgan Mine.

At the Mount Morgan Mine, the total ore developed up to the end of May was 18,780 tons of an average value of 8.8dwts. over 62 inches, but owing to its width the reef on No. 9 level could not all be carried in driving, and crosscuts are being put in to expose the full width, when a considerable increase over the abovementioned tonnage should be shown. Even so, the results of the work undertaken on the lines mentioned in the engineer's report have been disappointing, and there is no justification for erecting the comparatively expensive plant which we at one time contemplated, should the development prove satisfactory. All the levels have now passed the limit of the main pay shoot and we shall shortly close down development work for the time being and continue the experiments, which we are conducting with a view to arriving at a method of recovering the values developed with the present plant, with small additions.

Shareholding Increased.

You will notice in the balance sheet that our shareholding in the Rietfontein (T.C.L.), Ltd., has been increased since 1910, by £9,289 16s. 10d. This is due to paying the balance due on our proportion of the working capital shares and to subscribing our proportion of a further issue of 5,000 shares. During this year the development work has been practically confined to preparing the mine for stoping, and but little addition has been made to the development results recorded in the Engineer's report. The mine is now ready to supply the reduction plant of a capacity of about 60 tons a day, as detailed in the report. The plant is practically completed, and at any moment we may hear that it has started running. We have in fact just received a telegram to the effect that it will probably start to-day.

Other Investments.

On what is termed the Butterfly-Cecil Group, Rhodesia, in which we have a 20 per cent. interest, prospecting has been carried out on a number of small gold propositions with indifferent results. One block of claims has, however, shown some promise, and a quartz reef has now been followed to an incline depth of 300 feet. The values are, however, erratic, and on the whole of moderate grade. A small battery belonging to the concern has been erected on these latter claims and milling has commenced. The ore in sight will probably repay the total expenditure on this venture On the Marico Zinc Mines, development has been rapidly pushed ahead with encouraging results. Besides the original zinc workings on the farm "Witkop," another deposit has been opened up on the adjoining farm "Buffelshoek." At date, a large tonnage of ore containing a profitable percentage of zinc blende has been developed, and active inquiry is being made as to the most suitable plant for the production of a marketable concentrate. During the coming year it is expected that the plant will be erected and earning profits. The direct railway line from Johannesburg to Mafeking, via Zeerust, which is now approaching completion, will pass within a couple of miles of the property.

Swazi Tins.

Special reference is made by Mr. Garrard to the prospects of the Swaziland Tin, Ltd. Progress has been slower than we had hoped, owing to delays in delivery of machinery, but there has recently been a marked increase in the amount of tin recovered, and working costs have been reduced by nearly half, thanks to the improved methods of working introduced. Unfortunately, the flow in the river which constitutes the main source of water supply has greatly decreased of late through the poor rainfall of the past season, but further steps are under consideration for the more effective employment of the water available, which should have a most favourable effect on the company's output of tin. You will notice that during the past year most of the payable ore exposed on the Zaaiplaats Lease was crushed at ethe Groenfontein battery, materially reducing the total expenditure on this prospecting by means of diamond drilling was perty up to the end of the year. Probegun at the beginning of this year, and encouraging values were located at a point 100 feet on the dip of the vein from which the ore crushed last year was stoped. Driving from a winze towards this point is now proceeding. Stoping operations were resumed in May, with encouraging results. The stope faces are at present looking remarkably well, carrying a large body of high grade ore, but how far the present values will continue it is, of course, impossible to say. It is clear, however, that they have only to continue a comparatively short distance to enable us to recover the total expenditure on the Lease. It is hoped that, when a considerable body of ore has been stoped, arrangements can be made for further crushing at the Groenfontein battery. This is the only instance, I believe, as yet, in the occurrence of tin in the red granite in this country where it has been possible to actually stope ore on an extensive scale.

Tributing Lease.

A tributing lease was granted last month to the Zaaiplaats Tin Mining Company, Ltd., over about 21 acres on the farm "Roodepoort," immediately adjoining that company's own claims. Under this lease our company receives the satisfactory proportion of two-thirds of all ore won, free of cost. Our reason for granting the lease of this ground was that it is situated so far from our own workings, that the cost of supervison would be unduly high, and that we did not feel justified in carrying out any considerable amount of dead work on it. An ore body has now been opened up by the lessors on this lease, and it is hoped that a fair tonnage will result as our share. The ore mined will be treated in due course at the Groenfontein battery.

Decreased Profit.

As you will have seen, the profit earned at Groenfontein during the past year has greatly decreased, compared with previous years' results. Generally speaking, all the various tin occurrences have become greatly impoverished, and during the past six months we have not been able to do more than cover current expenditure, which has, however, included a large amount of exploratory work, undertaken with a view to locating further profitable ore bodies. Since February, the mill has only been run on day shift, and the monthly output has averaged about 19 tons of concentrates. Of late, the monthly results show improvement, and while there has been no discovery of marked importance, there are encouraging indications at various points, and in addition we are preparing to treat a larger quantity of the accumulated slimes. We can, therefore, see our way clear, at the worst, to meet all expenditure, including that of exploratory work on a considerable scale, for some months to come. Naturally, in the event of any important discovery being made, the whole aspect would be changed and milling to the full capacity of the plant would be resumed. With regard to the heavy capital expenditure on the hydraulicing plant, it is evident that were it not for this scheme we should have to constantly stripping the overburden by hand labour to lay bare the granite in the hope of discovering more tin-bearing pipes (this being the only way in which our phenomenally rich discoveries in the past were made). If the money now being spent per month on hydraulicing this overburden were devoted to hand stripping, the result from past experience would be that in any case it would take twice the time to do the same amount of work while we should not be recovering the tin in the soil, which, on the average, should just about cover the working expenditure. Consequently, what we shall save on the cost of hand stripping will go a long way at any rate to repay the capital outlay on plant, the work will be done in half the time, while the plant itself will, with some additions, be still available for working the valley alluvial as soon as the hill sluicing has been completed. From our past experience of this property, it would seem more than likely that in the course of the active development programme now being carried out—I may mention that last month 475 feet of underground driving and sinking were accomplished—combined with the extensive stripping of overburden by the hydraulic sluicing, we shall encounter ore bodies similar to some of those rich deposits met with in the past. I now beg to move the adoption of the reports and accounts for the year ended 31st December, 1911.

Mr. H. Daniel deplored what he described as gambling in Swazi Tins, and thought the company should avoid gambling on the Stock Exchange.

Mr. Boyd objected to the description of the transaction as that of gambling, and thought the investment would turn out a success.

Messrs. H. C. Boyd, E. A. Wallers, W. H. Dawe, S. Marks, J. Jeppe, J. A. van der Byl, and B. T. Bourke were re-elected directors.

Messrs. Alex. Aiken and Carter and Mr. H. J. Vining were reappointed auditors.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

INVESTORS' DIARY.

The following company meetings have been announced:—

July 19.—Transvaal Consolidated Lands.

July 26.—Booysens Estate; Middelvlei Estate.

Aug. 30.—Treasury Gold Mines; Wit. Deep; Crown Mines.

Sept. 4.—New Kleinfontein.

Sept. 21.—Wit. Deep.

Sept. 23.—Crown Mines.

Sept. 27.—Sub-Nigel; Simmer and Jack Prop.; New Kleinfontein.

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Notes and News.

The Late Mr. J. G. Hamilton.

It is our painful duty this week to chronicle the death of Mr. J. G. Hamilton, M.V.O., President of the Chamber of Mines, and head of the Consolidated Mines Selection group of companies. Mr. Hamilton had been seriously ill for several days, but the news of his death on Sunday morning came as a painful shock to the whole community. The usual hackneyed expressions fail to reflect adequately the sincere esteem and genuine respect in which the deceased was held on the Rand. As a captain of industry and administrator of affairs, his reputation was among the highest in the place; as a public man he was recognised as unusually able and disinterested; and as a man he was held in the highest regard by those fortunate enough to possess his friendship. The industry has few who can equal him in general all round accomplishments and attributes so desirable in men of his position to-day. In him it has lost a leader of integrity and power; and his place will be most difficult to fill. The funeral on Wednesday was attended by all the leading men of the Rand, and provided unique testimony to the position of the deceased in the public esteem. To his sorrowing wife and family the sincere condolences of the whole place go out in respectful sympathy.

Bellevue Tins.

At one end of the claim area held by this Syndicate, the Sterk River, which runs through almost the whole length of the block, joins the Megalaguene. The former, flowing west of the red granite range and the latter to the east of it, have, naturally, conveyed a good amount of alluvial tin towards the lower country. A large amount of this alluvial material is reported from the Bellevue ground adjacent to the junction of the two rivers, and it is reported that a sub-flotation of this asset is being arranged.

* * * *

Giant and Eldorado.

Persistent rumours reach us regarding the rediscovery of the reef in the Giant, the loss of which had done so much harm to Rhodesian prospects generally. Official confirmation is still, however, lacking. From the Eldorado nothing can be learned with regard to the value and extent of the reef in the lowest levels, but the worst views are held on this side, where the stock has been largely beared. Generally, the outlook for Rhodesia is regarded as improving. Engineers lately returned speak with admiration of the pluck and determination which they encountered, and, should the ambitious programme which the Goldfields Rhodesian and other big corporations have in view be successfully completed, the mining industry in the territory is bound to go ahead.

* * * *

Montrose Diamond.

At the special meeting, held in London in mail week, of the Montrose Diamond Company, Ltd., to consider the increase of the capital by 100,000 6 per cent. preference shares of £1 each and twelve shares also of £1 each, the latter to be called Deferred shares and to be entitled to 3 per cent. of the value of the diamonds obtained from the company's property. The chairman, Mr. A. J. Davis, moved the resolution, which was seconded by Mr. Percy Marsden, a director, who was convinced that if they had not been hampered by lack of working capital they would be producing diamonds on a large scale. Their yield of diamonds from test washings has steadily increased: whereas they were formerly obtaining a yield of 8 carats per 100 loads from No. 1 Mine, they had recently obtained yields up to 35 carats per 100 loads, and they had even obtained high returns from débris discarded as worthless in the past. The resolutions were agreed to.

Illogical Precision.

The paper of Mr. F. Percy Rolfe on "Illogical Precision in Mine Reports"—which was, if not worthy of serious argument, at any rate an interesting topic for debate—has been discussed at a recent meeting of the Institution of Mining and Metallurgy. The opinion of the majority, while not in favour of a misleading appearance of accuracy in mine calculations, seemed to be in agreement as to the importance of avoiding rule-of-thumb or casual methods of presenting results. As a correspondent of this journal pointed out the other day, it is merely a question of carrying out calculations to a definite end, and as one of those present at the I.M.M. meeting well remarked:—"To depart from strict accuracy as far as it could be obtained, would simply be the thin end of the wedge; would probably lead in a short space of time to loose and misleading statements; and would encourage perfunctory investigation and the shirking of trouble." The President, Mr. Edward Hooper, said that he found himself not altogether in accord with the author of the paper, although of course he was in sympathy with the motive of his recommendations.

* * * *

Oceana Consolidated.

As a preliminary to important developments in connection with its varied interests, the Oceana Consolidated Company is offering for subscription by the existing shareholders 300,000 shares of 10s. each at par. The company's chief interest lies in its mining holdings, the majority of which are in West Africa, and probably the development of these will in future receive the principal attention of the board.

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The Waste of Compensation Money.

Instances multiply daily of the folly of entrusting workmen with compensation in lump sums of money. In England, even prior to the Compensation Act, 1906, it had become apparent that the system of paying lump sums to workmen was inexpedient from the point of view of the workman. He receives an amount which, even if well invested, can only bring in a very small income; and he is, therefore, tempted either to live upon his capital or to buy the goodwill of a business. Cases are frequently reported from which it appears that the workman who proposes to set up in business is generally misled as to the purchase price, and hopelessly fails to understand the business into which he is suddenly plunged. It was for the protection of workmen who squander their money in this fashion that the County Court Judges were authorised by the Act of 1906 to retain a lump sum and pay it out by instalments; but it is surprising what pressure is brought upon County Court Judges to make payment of a lump sum. A case is reported in the English papers where a workman, to whom an employer was under no legal obligation, had a choice of accepting £30 down or a pension of 25s. a week. He actually chose the lump sum, and spent it in about a month!

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A Municipal Engineering Scandal.

Winburg (O.F.S.) Municipality has, to say the least, a curious way of carrying out its civic duties. Its extraordinary methods are now exciting the ridicule of Johannesburg engineering firms because of a recent display of official bumbledom. Tenders, it appears, were lately invited for the supply of an electric lighting plant to the town, and a loan was contemplated from the Provincial Treasury to defray the cost. Several of the leading firms on the Rand put in competitive tenders, and most of them went to the expense of despatching engineers to investigate the possibilities of the scheme. Tenders were duly opened, published, and adjudged. To the general surprise, however though all the firms competing were of the highest standing, a tender other than the lowest was, for no ostensible reason, accepted. The accepted tender, indeed, was not nearly the lowest; in fact, there were a dozen below it, and repeated applications to the Town Clerk for an explanation of the slur thus cast on the plant offered at a lower price by the disappointed firms were met by a curt refusal to discuss the matter. The exact words were, "the interest of the ratepayers guided the decision." In the absence of a body such as the Home Local Government Board to investigate this extraordinary action on the part of the Mayor and Council of Winburg, it is highly desirable that the Administrator, Dr. Ramsbottom, take the necessary steps to remove the Municipality in question from the stigma of the insinuations that are now being freely made against it. We are glad to notice that our contemporary, the *Friend*, has already taken the matter up; and, should the loan not yet be granted, it is to be hoped that the Administrator will in this case exercise even more than his usual strict supervision.

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Robinson Central Returns.

A gratifying circumstance in connection with the June declarations is the return of the results obtained at the mines of the Robinson group. Hitherto the custom of providing early and reliable information with regard to mining operations month by month, which has been observed by the majority of the mining houses, has been rather pointedly ignored by the Mayfair administration, presumably in accordance with the desire of Sir Joseph Robinson, their chairman. The policy of allowing shareholders and others to draw their own conclusions has doubtless been found to be an injudicious one, especially in view of the more recent achievements of both the Langlaagte Estate and the Randfontein Central. The financial Press in Europe has shown an inclination to criticise matters somewhat harshly, and it will be remembered that Sir Joseph was lately asked in London to justify or explain the condition of affairs at Randfontein as indicated by the S.A. *Mining Journal* The new attitude adopted in regard to the publishing of results is a welcome change, and a sign, we trust, of a more sympathetic view of the shareholders' claim to be considered. The following are returns for the past six months, according to the figures supplied by the Chamber of Mines:—

1912.	Tons milled.	Yield. ozs.	Estimated Profit.
January	215,556	62,451	£74,000
February	211,443	59,288	65,000
March	229,642	61,354	53,000
April	199,518	56,856	58,000
May	210,138	61,441	72,780
June	198,547	58,732	75,250

It is pleasing to note a decided improvement in the profits, and a marked betterment in the yield.

* * * *

E.R.P.M.

The Secretary of the East Rand Proprietary Mines, Ltd., writes: "In future publications of outputs, profits or other mining matter, I am directed to ask you to be good enough to treat the East Rand Proprietary Mines as a separate unit. The company is controlled by no mining house in particular, and to group it with the companies administered by the Anglo-French Corporation is misleading."

* * * *

Duties of Mine Inspectors.

The following significant recommendations are made in the recent report of the New Zealand Mines Commission:—(1) That Government Inspectors of Mines be required to pass a special examination, higher than that of a mine manager, before appointment. (2) That, in order to enable Inspectors of Mines more effectually to carry out their duties and to enforce their orders, they have summary power of prosecuting in all cases affecting the safety of workers in mines; but that in cases of death, or serious bodily injury, or dangerous practices, the Inspector should consult the Inspecting Engineer of Mines before taking proceedings. We believe that if they had such powers it would have a better effect in compelling both the management and the men to observe the precautions necessary for safety. (3) That the Inspector of Mines be given power to withdraw men from dangerous places in mines, and that an Inspector's duties be restricted to inspections of mines and duties appertaining to mines only under both the Coal Mines and Mining Acts respectively. (4) That it be made compulsory for all deputies during their rounds to examine the roof and sides, irrespective of the examination by miners and workmen's inspectors.

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S.A. Tins.

Latest reports from the property of the S.A. Tin Company are of a more encouraging nature, and go to show that the company is coming through its troubles. The discovery of the duplication of the ore-body has saved the situation, and the mill is being fully employed to crush ore from the new workings. Indeed the question of adding fifteen new heavy stamps is under consideration. Last month 29 tons of concentrates were shipped from the property, and under the supervision of Mr. Michael Dodd—one of the directors, who is relieving the manager, Mr. E. A. Ford, on holiday—even better things are expected this month.

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Central Labour Organization.

The announcement in our last issue that the groups—excepting the Robinson—had agreed to form a combined labour recruiting organization has, naturally, been welcomed by shareholders and all friends of the industry. The tendency everywhere throughout the industrial world is for co-operation to replace competition; and that the mines of the Rand should have for so long persisted in an outworn form of costly competition for native labour was, to say the least, surprising, in view of the progress shown in other directions. In one important particular our article of last week calls for emendation. The administration of the new organization will be in the hands of a board of management, presided over by a paid chairman, who will be the head official of the new organisation. There will be no general manager, but the board of management and the chairman will have the assistance of Mr. H. M. Taberer in the capacity of General Superintendent. We understand that Mr. C. W. Villiers has been appointed Chairman of the Board of Management.

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Proposed Natal Labour Association.

The committee appointed by various unskilled labour employing interests in Natal have decided to report to their electing bodies that the original scheme for the formation of a Labour Association could not be successfully completed on account of the manufacturers having retired from the negotiations, and the Natal Agricultural Union having decided to again refer the scheme to affiliated associations in view of difference of opinion in regard to the financial proposals. At the same time the committee have agreed to submit to their electing bodies a memorandum of new proposals suggested by Mr. John Kirkman, representing the Sugar Growers' Association. This memorandum provides for the formation of an Executive Board of Associated Employers of Unskilled Labour, having for its object the preliminary work of investigating the requirements for the establishment of an Association for recruiting and distributing unskilled labour with the view of definitely forming a board for such recruiting and distribution.

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"Spratts" for Natives.

The name of Spratt is commonly associated with a kind of biscuit which is claimed to be excellent for dogs, but, as we pointed out the other day, the firm of Spratts Patent, Ltd., are the makers of a similar preparation which is said to be admirably adapted to the native stomach. Spratts' biscuits have been used for some time at the Consolidated Main Reef in place of the ordinary bread ration required by the regulations. Within the last few days the Native Affairs Department have consented to accept two of these biscuits as equivalent to the 8oz. ration, and the W.N.L.A. have entered into a contract with the makers' local representative to supply boys coming from Ressano Garcia with the biscuits instead of with bread, as hitherto.

TOPICS OF THE WEEK.

THE NEW PAYMENT SYSTEM ON THE MINES.

We are enabled in this issue to print in full the new general form of agreement for underground contract work to be introduced at the beginning of next month on all the mines of the Rand, except those of the Robinson group. The terms of this agreement are interesting because they represent an honest and painstaking effort on the part of the mines to meet the new conditions created by the Government Mining Regulations recently introduced on the Rand. An added interest has been lent to them by reason of the fact that the officials of the so-called Miners' Association, who have long been kicking their heels in obscurity, have seized upon the occasion to arouse the worst fears of the men. The chief, indeed the only, weapon in the hands of the agitators is the necessary complexity of some of the clauses in the agreement. That complexity, however, it will be apparent to any student of the matter, is necessitated by the number and variety of the conditions which the contract is designed to meet; and is shown, on application to concrete instances, to be more apparent than real. Again, much is made of the fact that there is united and uniform action on the part of the mines, and that the men are receiving notice in so precise and formal a manner. These grounds for suspicion and uneasiness, however, can only prevail with the most ill-informed, for the contract and the formal notice of its introduction are but as rendered necessary by the new Government Regulations. It may be asked why, if the complicated nature of the new agreement be admitted, no effort is made to explain it in detail to the men. The answer is that every mine manager and mine captain on the Reef has been given ample opportunity to discuss the document with the consulting engineers of the groups, and to make themselves thoroughly masters of it in order that they in turn might be able to elucidate it by word of mouth to their men. After all, there is no clearer way of explaining a difficulty than by word of mouth, and the consulting engineers no doubt have taken the wisest course, though we ourselves should like to have seen an explanatory printed memorandum accompanying the draft agreement. In its absence we are not going to attempt to take on ourselves at short notice to supply the deficiency, and we are content, therefore, this week to print the document in full, thus giving it, for the first time, complete publicity. It is an open secret that it has taken the consulting engineers of the groups quite six months and an enormous amount of patient study of the changed conditions to evolve it. Emphatically is it true that the new contract represents no Machiavellian attempt to reduce wages. Setting aside all the froth and fund-raising claptrap of the Labour extremists, it may be said at once that if the men do not understand or have any misgivings about the new form of contract, the heads of the mines and groups responsible for it will, no doubt, only be too glad to receive bona-fide deputations from employees on their mines to discuss the whole matter. Thus by the use of common-sense and patience, the men, we have no doubt, will suffer in no way from the innovation; and the only danger in the situation arises from the intervention of interested agitators or the men's own suspicion of change merely because it is change. It is clear that what disadvantages the new terms have are balanced by new advantages. The cost of stores and boys is to be reduced to offset any reduced price per fathom offered, and a fixed minimum day's pay is guaranteed to remove all fear of "coming-out-in-debt." This last is a very valuable concession, which goes far to offset any reduction in the big cheque. Apparently, however, the Labour extremists regard the opportunity as too good to be allowed to let slip. The men, however, will be well advised to remember their fate at the hands of the self-same agitators on a former unfortunate occasion, and to refuse to be dominated by extremists. The new agreement may, or may not, in practice justify the claims put forward on its behalf. Surely it is not unfair to ask the men to give it a fair working trial?

COMMON PROBLEMS OF DEEP LEVEL METALLIFEROUS MINING.

The reports of the Queensland and Western Australian Commissions on mine sanitation, which sat last year, have been followed by the report and proceedings of the New Zealand Commission which sat in the autumn of last year. The field covered by the last Commission included both coal and metalliferous mines. The most important questions dealt with were the prevention of accidents, the ventilation of mines, underground sanitation and miners' phthisis. In regard to the prevention of accidents, we note the following recommendations: That the maximum height of stopes be 8 feet 6 inches from the working floor; that there be two outlets from every mine; that a water-blast or similar apparatus be used after blasting; that "instantaneous" fuse be prohibited; that shift bosses be required to examine "backs" and sides of working places independently of inspectors. Passing on to ventilation, the report strongly urges that mechanical ventilation should be made compulsory in the deep metal mines of the Dominion. As regards vitiation standards, the English coal mine standard is followed as regards oxygen, viz., a minimum of 19 per cent., while as regards CO_2 a maximum of 1 per cent. is preferred to the English 1¼ per cent. No suggestion, however, is made for the periodical testing of the exhaust air and for analysis for other gaseous impurities. It is suggested that special rules should be made under which mines should be classified according to the amount of inflammable and noxious gases in the return air way; but if the Commission did not see their way to decide what were noxious gases or what proportion were admissible, it is rather evading the issue to say special rules should be framed to decide an important principle. As regards sanitation, the Commission found a "very unsatisfactory conditon" prevalent. For baths and "drys" there was a general request that these be provided and maintained at the sole cost of the mines. Their use, however, is to be left entirely optional. In regard to the treatment fo phthisis, the report has little that is new to the Transvaal. It is obvious that the question is not generally understood. Only two of the medical witnesses—*e.g.*, Drs. Conlon and Scott—had studied contemporary researches in other countries. Dr. Conlon is apparently the only investigator who has sought to get any statistics of mortality from miners' phthisis; he estimated the average age of death from phthisis for the past twelve and a half years in the Reefton at fifty-five, which places that district in a favourable light, as compared with Cornwall, the Rand, or most Australian camps. As remedial measures we may note the proposals for the water-blast, while the use of a jet or spray in "the battery or place where such crushing or drilling is done" is already provided for by the Mining Amendment Act of 1910. There remains to be considered the exclusion of consumptives from mines. Here the Commission are evidently mindful of the serious strike in New Zealand when it was proposed to examine miners after miners' phthisis was scheduled as an occupational disease. They state that the exclusion from work underground of infected persons is a matter insisted on by all authorities. But all they are prepared to suggest is that miners affected, or supposed to be affected, shall have free medical advice from the State, and that the State should give a grant-in-aid to the Gold Miners' Relief Fund for those suffering from miners' phthisis. These two benefits, however, are only to extend to persons resident in the Dominion for five years previous. The two miners who served on the Commission contributed a minority report designed to show that the two contributory causes of miners' phthisis are the contract system and the night shift. Extracts from their statement appear elsewhere in this issue, and throw an interesting sidelight on the part played by these as contributory causes of phthisis, in the opinion of the miners. The whole report—as may be seen from the extracts we print elsewhere— though obviously a little out of date, is an interesting commentary on the problems of modern deep level mining common to all fields.

THE SCARCITY AND INEFFICIENCY OF MINERS.

Chairmen of mining companies have over and over again in recent months railed at the inefficiency of the present white labour force and the scarcity of good miners. It would be easy to multiply quotations in support of these statements, but it may be enough to recall that of Mr. M. G. Elkan, who said, at the annual meeting of Messrs. A. Goerz & Co., Ltd., a few days ago: "With regard to skilled labour, while 1910, compared with 1909, showed an increase of nearly 2,300 white employees on the mines, there was a small decrease in 1911, namely, 171, as against 1910, but this is of no importance. Many complaints are, however, received relative to the quality of this labour, particularly as to its efficiency. Whether this is due to a want of knowledge on the part of the men, or to other causes, I am unable to venture an opinion, but I should like to express the earnest hope that, on close investigation, allegations such as have reached me lately, which would point to a kind of conspiracy to do so much and such quality of work and no more, will prove to be wrong. Such tactics would certainly not prove to be in the best interests of the white employees on these fields. Notwithstanding what agitators may say, it is a well-known fact that the mines have for years shown a keen desire to employ white labour in ever-increasing numbers. I think the white employees would be well advised not to make the employers regret this policy; they, the employees, would be the sufferers from a change." As a supplement to these significant words, it may be well to recall that, apart from the phthisis evil, the Rand as a field for skilled mine labour has advantages which are exceeded in few other mining regions of the world. It is said, of course, that the high rate of pay which prevails here is merely commensurate with, and dependent upon, the dangers incurred, including the danger of phthisis. To some extent this may be true, but when the wages paid to tradesmen generally is remembered, it appears that the scale of underground wages is in conformity with the scale of living which prevails in this part of the Union, rather than specially contrived as an offset to the dangers and discomforts of mining. Even so, the rate of wages is not a meagre one, and if other conditions were equally satisfactory, there is little doubt that miners would flock back again as in earlier days. In the report of the Department of Mines of Western Australia for 1910, we find that the wages payable to mining employees under various arbitration awards and industrial agreements—in which, according to all accounts, the employees have not come off second best—are materially lower than the wages paid to the same grades of labour on the Rand. Rock drill men, for instance, obtained from 15s. 6d. to 12s. 4d. per shift in the former region, according to the particular nature of their occupation, in shafts and elsewhere. In the latter field, pay for the same grades varied from 23s. 11d. to 20s. 3d. Miners on hand labour averaged from 15s. to 10s. 10d. in Western Australia, as against 25s. and 17s. 11d. for contract and day's pay on the Rand. It has to be borne in mind, moreover, that the wages in the first case are paid for actual work, whereas in the second they are paid, practically, for supervision. Trammers were paid as low as 10s. 10d. in Western Australia for doing work which trammers on the Rand were paid 13s. 6d. per shift for supervising. And so the list might be extended. There are allowances to be made for the cost of living, of course, but even with these the rate of pay upon the Rand is on the whole superior to that elsewhere to a marked degree. Despite this, the supply of good men is woefully inadequate. "The fact is," said Mr. R. A. Barry, the manager of the Nourse Mines, in a recent address, "there are not enough miners to go round; good men can pick and choose and move about in the most extraordinary way to suit any whim they may have, for billets are always obtainable; whilst poor miners are for ever being turned over by one mine after another in the search for the unobtainable. . . . We get inefficiency everywhere underground despite the tremendous wages we pay." The problem, we are glad to know, is now engaging the serious attention of the best brains of the industry.

THE PROGRESS OF WORKING COSTS AND PROFITS.

The Dawn of Better Days in 1909—Hopes Unfulfilled and Anticipations Falsified—The Tendency of the Last Three Years.

The year 1909 has the distinction of being that in which the lowest average level of working costs ever attained on the Rand, unequalled since, was reached, and if one reads the speeches made at company meetings during that period and the statements endorsed by consulting engineers, to say nothing of the enthusiastic treatment of the question in the Press, both here and in Europe, it is abundantly evident that the era of low working costs was believed to be still in the making. In August, 1909, speaking at the meeting of the New Modderfontein Mines, Mr. Samuel Evans, apropos of the economies to be obtained from the enlargement of the scale of mining, said: "No doubt the main reason for the rapid recent development of large-scale production is the general realisation of the wasteful character of small plants. In July last the working costs, exclusive of development, of the nine companies crushing 10,000 tons and under amounted to 20s. 6d. per ton, whilst in the case of the eight companies (for which returns are available) crushing, with one plant, over 40,000 tons, costs, exclusive of development, amounted to 12s. 11d., a difference of 7s. 7d. per ton. The importance of this will be realised when we remember that the dividends of Rand mining companies averaged for the four years ended December 31st last 8s. 8d. per ton milled. The fact is, we are in the midst of what I may term an industrial revolution, the far-reaching effects of which on the dividends of shareholders and on the prosperity of South Africa has not yet been realised by the public, and will, indeed, only be correctly appreciated in a few years' time."

Press Enthusiasm.

A writer in the *Investors' Guardian* of February 12th, 1910, several months later, it will be observed, quotes, also, the remarks of Mr. Leslie Simson, then superintending engineer of the Gold Fields group, with regard to the reduction of the capital cost of plant, and continues in the following strain: "These weighty statements as to the policy and views of such powerful groups as the Corner House and the Consolidated Gold Fields cannot fail to carry conviction to every unbiassed mind that a substantial decrease in the cost of Rand mining may be confidently anticipated without any undue display of optimism. Even now lower working costs have transmuted hitherto valueless ground on the Rand into more of the precious metal than any alchemist of the Middle Ages could have imagined in his most inspired visions, and when a yet lower range has been established the natural consequences will be that larger areas of ore deposits, off the reef as well as on it, now unpayable, will be brought within the scope of profitable mining operations. It is notorious that the Main Reef proper is so poor in many parts of the Rand that it did not pay to work it until a great reduction in cost had been effected. The richest gold producing reefs of the Witwatersrand series have been the Main Reef Leader and the South Reef, but now that such significant economies have been introduced the working of the Main Reef has resulted in a tangible and satisfactory addition to the total value of the Rand output. The reduction of working costs may also bring within the region of profitable mining a considerable portion of the Battery or Kimberley Reef, which has been worked at several points, especially on the West Rand. The West Rand Consolidated has been developing this reef, which underlies a large number of its claims, and proposes to draw large quantities of ore from it when the reduction plant reaches a scale commensurate with the area of the property."

Retrogression Begins.

The average working costs, including development, for the year 1909, was 17s. 1d. per ton milled. In January, 1910, when the preceding paean was put on to paper, costs came down to 17s. In February they rose to 17s. 6d. and fell in March to 17s. 1d. They have never been as low as 17s. 1d. since. The retrograde movement in costs ceased somewhat unexpectedly and the industrial revolution was checked.

The following figures record briefly and sufficiently the progress of affairs since the beginning of 1908, in which year the campaign against working costs began to shape itself efficiently:—

	Tons milled.	Recovery per ton milled.		Costs per ton milled.		Profits per ton milled.		Dividends per ton milled.
		s.	d.	s.	d.	s.	d,	s.
1908	18,196,589	31	5	18	0	13	5	9·38
1909	20,543,759	28	11	17	1	11	6	9·06
1910	21,432,541	28	6	17	7	10	6	8·28
1911	23,888,258	27	11	18	0	9	7	6·50

Although costs averaged 18s. in 1908 and 1911, the profit per ton milled fell 28 per cent. and the dividend per ton fell more than 30 per cent. Reduced grade was obviously the reason of the diminished declarations. In 1909 the biggest dividend ever paid by the Witwatersrand was secured, it will be seen, by the businesslike process of crushing a larger quantity of ore as an offset to reduced grade. The process was continued during the two following years, but the costs, instead of diminishing as might have been anticipated on paper, or, at any rate, remaining stationary, rose to a point which defeated the project, and showed the futility of the "small profits-large turnover" policy in the face of an uncertain and inefficient labour supply. In 1908 the average number of stamps dropping was 9,025, with 90 tube mills; in 1911 the average number of stamps increased to 9,432, with 216 tube mills. The milling duty rose from 6·19 to 7·88 tons per stamp per day during the same period. It is abundantly clear that a good deal of capital expenditure has been incurred and an enormous amount of effort exercised in a wrong direction during the last three years, with the result that more than a million and a half sterling has been lost in dividends, and an equipment has been provided which, in accordance with a long and apparently irrevocably established policy, has to be kept in full working activity. If it was difficult to keep 9,432 stamps, with 216 tube mills, continually supplied with rock of an average value of 6·57 dwts. during 1911, the difficulty is not likely to be diminished this year, unless development is materially advanced and labour becomes more abundant.

The Prospects of 1912.

It is interesting to observe the way in which things are shaping on the Rand this year, and the following table is given, therefore, for the purpose of showing the salient features of the past five months:—

1912.	Stamps.	Duty per stamp per day.	Sorting per cent.	Recovery per ton milled.		Cost per ton milled.		Profit per ton milled.	
				s.	d.	s.	d.	.	d.
January	9,485	8·02	12·59	27	6	18	10	8	11
February	9,420	8·16	12·81	28	3	19	2	9	2
March	9,525	8·29	12·72	28	1	18	11	9	0
April	9,416	8·31	12·72	28	6	19	0	9	8
May	9,480	8·31	13·08	28	6	18	9	9	10

When these figures are compared with those previously quoted it will be seen that while the monthly tonnage is being expanded recovery is being increased, with the result that profits are being bettered latterly in spite of working costs, which appear inclined to follow the rising tendency of the other columns. Allowance must be made for the fact that reserves are not now kept, so that gold which was formerly withheld from the "recovery per ton" column is now included in it. It is impossible to say at a glance, therefore, whether there is any real improvement in evidence or not. Sorting, it will be noted, which averaged 13·01 per cent. in 1911, having tapered off from 13·53 per cent. in January of that year to 12·11 per cent. in December, is being pulled up again. One feature that is not altogether satisfactory in the above statement is that of the working costs, and, taking things altogether, as far as they can be gathered from the figures given, there is an appearance of increased effort at greater cost and insufficient evidence of improvement in actual recovery. Even if one disregards the gold saved from the reserve account, there is on the best showing, that of May, an advance in recovery of sevenpence offset by an increase of ninepence in costs as compared with the average of last year.

The Essential Factor.

Working costs are obviously at the root of the whole difficulty, and unless steps are taken to remedy the position from this standpoint it seems inevitable that the present year will show no exception to the tendency which has been remarked in the first tabular statement which appears in this article. The agreement which has been arrived at between the rival employers of aboriginal labour will doubtless help to improve matters somewhat, but a more abundant supply is of no less importance than a cheaper one, and the agreement only affects the latter question.

ELECTRO-METALLURGY OF TIN.

Some Results of Recent Experiments in the Smelting of Tin by Electricity—Application to Transvaal Ores.

Mr. Gerard Bissik, Pretoria, writes us as follows:—In your issue of 29th June appear some very interesting details, taken from the *Journal du Four Electrique*, with regard to recent experiments in the electro-metallurgy of tin. As the figures quoted therein are, for the greater part, of a purely technical nature, it will probably be of interest to many of your readers to have the note in question supplemented with some practical results obtained in the smelting of tin by electricity. In the issue of the 7th March, 1912, of the *Elektrotechnische Zeitschrift*, an article is published on "Das Elektrische Schmelzen von Zinn," by Joh. Härdén, which, from the figures quoted, would appear to refer to the same experiments as those alluded to in the *Journal du Four Electrique*. The following is a short *resumé* of the most interesting information contained therein. The experiments were made last summer in Cornwall by Mr. Härdén for the Gröndal Kjellin Co., Ltd., of London:—

The Old Cornwall Method.

With reference to the old Cornwall method, it is stated that the smelting of tin has been carried on in that country for centuries. The ore (or concentrates) generally contains from 63 to 64 per cent. of tin, and is supplied to the smelter as a wet powder of a fineness of about 0·5 to 1 m.m. The Cornwall ore is seldom treated by itself, but is, as a rule, mixed with ore from Bolivia or the Straits Settlements. The first rich slag obtained by the usual Cornwall method contains 11 to 16 per cent. of tin, and is again treated. From the final slag with 6 to 7 per cent. tin and lead-residues, solder is made. In modern installations this percentage in the slag is brought down to 2·5 to 3, but 4 to 6 per cent. is not unusual. The tin obtained, which is still very impure, is then treated in the reverberatory furnace, and is separated into pure tin and so-called "hardhead." The further treatment of this "hardhead," containing a considerable quantity of tin, is very difficult, and one of the principal objects of the electrical method is to prevent its formation. The product from this second process, containing 96 to 98 per cent. of tin, is collected in large refining-pans heated from the bottom, and the further purification is accomplished by the introduction of oxidising agents and refined tin of a purity of 99·6 to 99·8 per cent. is obtained. This is usually cast into blocks weiching 28 pounds.

Electric Tin Smelting.

After comparing the effect of the high temperature produced in the electric furnace, with that of the reverberatory furnace, on the tin-oxide, it is stated that a slag can be obtained containing only 0·25 per cent. of tin. It appears, however, to be more economical to produce a slag with 14 to 16 per cent. and re-treat this in a second furnace to extract the metal. The article then speaks of the chemical reaction and the energy required, which, in detail, are the same as mentioned in the article already referred to in the *S.A. Mining Journal*. After experimenting on a small scale, it was decided to treat larger quantities. The necessary precautions were taken to prevent loss of metal through volatilisation and the consequent losses of tin amounted to only 0·5 per cent. and less. The treatment, which lasted from 10 to 12 days, as stated in the former article already alluded to, could be carried on continuously for months without interruption. In the treatment of ordinary Bolivian ore with only 49·5 per cent. tin and about 15 per cent. iron, an average product of 92 per cent. and on some days of 97 per cent. was obtained. The liquid metal was collected in the usual heating-pans and air was blown through by means of a perforated iron pipe. In this simple way tin of a commercial purity of 99·75 per cent. and higher was obtained. It was proved that a slag containing only ¼ per cent. of tin could easily be produced, but it is considered more advantageous to leave a higher percentage in the slag, and re-treat it in a separate furnace to extract the metal or to produce a solder.

Conclusions.

The experiments have proved that the electric furnace immediately and continuously produces a pure tin, which is not the case with the reverberatory furnace. The production of "hardhead" is much reduced. The electric furnace requires only 14 per cent. of reducing coal (anthracite) or charcoal, instead of from 20 to 25 per cent. in the reverberatory furnace. With proper supervision, natives could be employed as workmen. Briefly, the experiments described above will probably be continued with improved methods, which promise to give still better results. In view of the foregoing results, and the low cost at which power can be produced in the Transvaal, on acount of the cheapness of coal, it would appear that the electric smelting of tin-ore will be commercially possible, locally, in the very near future.

Rooiberg Minerals.

The following are particulars of the estimated results of operations on the Rooiberg Minerals Development Co.'s property for June:—Old mill, 10 stamps ran 29·7 days; new mill, 10 stamps ran 23·9 days; milling 3,459 tons; concentrates, 83·55 long tons; average assay value metallic tin, 67·2 per cent.; net capital expenditure, £3,464; estimated profit, £1,537; adjustments due to fluctuations in the price of tin to be deducted from estimated profit in respect of February shipments, £211; net profit for month, £1,323 8s. 11d. The concentrates in reserve at June 30th amounted to 17·33 tons (2,240 lbs.), of the net value of £1,616. The high cost of working is due to running both mills and changing over to and conditioning the new plant.

THE CONTRACTORS' NEW FORM OF AGREEMENT.

Facsimile of New General Form of Agreement for Underground Contract Work on Mines of the Rand—Debated Clauses in Detail—Uniform Draft Agreement Prepared by the Groups—A Much Discussed Document Found to be Without Alleged Sinister Significance.

In accordance with Chapter XI., Mines and Works Regulations, 1911, it is necessary for all contracts to be in writing, and therefore contractors on the mines are notified that as and from the 1st August, 1912, a general form of agreement for underground contract work, as per the following copy, will be in use. The rates for work will be as agreed upon between the management and employees; and the charges for stores will be as set forth in the copy of agreement. The following is a literal copy of the form of agreement drawn up by the groups, which is to come into force on August 1st:—

Agreement made and entered into by and between   Limited, of the one part, hereinafter called "the company," and   of the other part, hereinafter referred to as "the employed." The Company agrees to engage the services of the employed, and the employed agrees to accept service with the Company on the underground work set forth in Schedule "A" hereof, or in such other place or places in or upon the property of the Company as shall be mutually agreed upon subject to the following terms and conditions. (1) The employed declares himself to be a skilled and qualified person in the performance of the said work. (2) The employed shall not substitute any other person (except with the written consent of the Company) nor sub-let the performance of the said work, but shall, while this agreement is in force, personally devote all his time and energy in the performance thereof during the usual hours of work and subject to the customs, rules and regulations in force on the said Company's property. Any substitute appointed by the employed shall for the purposes of this agreement be the agent of the employed. (3) The employed shall satisfy himself as to the correctness of the measurement of his working place before commencing work for the first time in any working place. (4) The amount of work done by the employed shall be measured up monthly, and the amount of wages due under this agreement less any deductions hereinafter mentioned shall become due and payable to the employed on a day, not later than the seventh day of the following month, as may from time to time be notified by the Company by a notice affixed on the official notice board of the mine. (5) This agreement may be terminated at any time by either party giving 24 hours' notice to that effect. The Company, however, shall have the right instantly to dismiss the employed without any notice whatsoever for drunkenness when on duty, neglect of duty, incompetence, maltreatment of natives, refusal to obey any lawful order, or for wilfully causing any damage to machinery or other property of the Company, or for any breach of the terms of clause eight hereof. In the event of the agreement being terminated as provided for in this clause, the employed shall only be entitled to receive payment for work completed by him up to the time of such termination. It is, however, stipulated that in the event of the employed terminating this agreement before he has worked twenty full shifts since the date of the last measurement, or absenting himself from work without producing a doctor's certificate within two days as provided in clause six, it shall be optional for the Company to pay the employed on the basis of this agreement. In the event of the Company deciding not to pay on the basis of this agreement, they shall pay to the employed a sum of   per shift for the shifts worked in full settlement of all wages due, and the employed shall have no other claim against the Company. (6) In the event of the employed being absent from any working shift for any cause whatsoever, the Company shall have the right to continue the work, in which case it shall be optional for the Company to charge the employed with the actual cost of continuing the work, or to deduct from the net amount due to the employed a sum equivalent to the average rate per working shift due on this agreement for each shift so worked by the Company. Should the employed be absent from work without permission, the Company shall have the right to deem this agreement to have been abandoned unless a doctor's certificate of illness is produced within two days from the last shift worked. (7) The Company will as far as possible supply the employed with reasonable facilities for carrying out the work, but does not accept responsibility for failure to do so. (8) The employed shall hire all necessary skilled and unskilled labour from the Company, and shall purchase all stores and materials necessary for the said work from the Company, who shall supply the same to the best of its ability at the rates specified in Schedule "B" hereof. (9) The employed shall be held responsible for the machinery and tools entrusted to him. The Company undertakes to do all repairs which may become necessary through ordinary work and wear and tear and to supply the necessary working parts, but in the event of wilful damage, negligence, or incompetence, where damage shall occur to machinery or tools entrusted to the employed, the employed shall be held responsible and shall pay for all necessary repairs. (10) The net earnings under this agreement for any period shall be the amount by which the net sum due to the employed under Schedule "A" exceeds the net sum due to the Company under Schedule "B." Details showing how the said sums are made up will be set out in the Cost Sheet supplied to the employed as prescribed by the Mines and Works Regulations for the time being in force. When there is more than one employed person as party to this agreement the Company reserves the right to apportion the net earnings under the agreement on the basis of the number of shifts worked by each person. (11) (*a*) The moneys due under this agreement shall only comprise the net earnings less any deductions which the Company may be entitled to make under the provisions of clause six, clause nine, and clause twelve hereof; or (*b*) The guarantee of wages due under this agreement shall comprise   per shift for each shift worked (plus the net earnings less any deductions) which the Company is entitled to make under the provisions of clause six, clause nine, and clause twelve hereof. (12) Should in any month the sum due to the Company under Schedule "B" exceed the sum due to the employed under Schedule "A" the Company shall have the right to deduct the excess from the net earnings of the employed for the succeeding month or months. (13) This agreement is in addition to the ordinary agreement of employment existing between the Company and the employed. (14) The employed hereby acknowledges to have received a copy of this agreement, together with the attached Schedules, with the contents of which he has made himself acquainted. As witness whereof the said Company and employed have set their hands. Note.—Paragraph 11 (*a*) applies to "Flat Contracts" only, and should be eliminated from other agreements. Paragraph 11 (*b*) should be eliminated in the case of "Flat Contracts."

Schedule "A" shows shaft, working place, class of work, price per fathom, per foot, and remarks. Sizes of excavations:—Shafts,   feet wide x   feet; drives,   feet wide x   feet; cross-cuts,   feet wide x   feet; winzes,   feet wide x   feet; raises,   feet wide x   feet. All work shall be carried out in accordance with the instructions of the Manager or his representative. The cost of stripping, removing footwall or hanging wall, sliping, or regrading rendered necessary by the negligence of the employed will be charged against the employed. *Pillars.*—These are to be left as directed by the management. No payment will be made for drive pillars, *i.e.*, pillars left along the upper or lower limits of the stope or portion of stope let to the employed. Payment for pillars left within these limits (*i.e.*, stope pillars) will be made on a fathomage basis as though stoped, and will only become due to the employed completing the work; special pillars or pillars already partially cut at the commencement of a new agreement will be a matter for a special written arrangement between the parties to this agreement. Boxholes and manholes will be paid for at per foot up to a maximum of feet, except by previous written arrangement between the parties to this agreement. *Timbering, etc.*—In such cases where timbering or other such work necessary for the safety of the working place or places is required of the employed in addition to regular stoping, the work shall (shall not) be considered part of this agreement.

Schedule "B."—Cost of labour and stores supplied by the Company to the employed shall be debited against the employed at the following rates:—White labour (skilled), at cost: white labour (learners), at not less than 2s. per shift; coloured labour (hammer boys), ½d. per inch; coloured labour (all other), at cost (including bonus). Note.—Compound, recruiting charges, etc., are not charged in this contract. Gelatine (92 per cent.), 45s. per case; gelignite (60 per cent.), 35s. per case; fuse, 9s. per packet of about 600 feet; detonators (No. 6), 2s. per box of 100; detonators (No. 8), 3s. per box of 100; candles, 4d. per lb.; other stores, at cost.

THE CAMPAIGN AGAINST PHTHISIS.—IV.

Report of the New Zealand Government Commission—Preventive Measures Advocated—Some Lessons and Comparisons.

The report of the New Zealand Commission on Phthisis and Mine Ventilation has the following, *inter alia*:—From the evidence it is apparent that the disease has not in New Zealand assumed such proportions as indicated by the returns from Cornwall, Bendigo, Queensland, West Australia and the Transvaal. In proof to the same effect it should be stated that during the period between the 10th October, 1908, and the 24th December, 1909, when pneumoconiosis (a term which formerly was used to classify a group of diseases all similar in character, amongst which miners' phthisis is included) was a disease in contracting which a miner was entitled to compensation under the Workers' Compensation Act, not a single claim was made for compensation in respect of the disease. The preventive measures considered by us, and which have been generally recommended by other Royal Commissions elsewhere, are as follows: (1) The compulsory use of dust-preventing appliances, such as sprays, waterblasts and atomizers. (2) Improved ventilation of mines. (3) Use of bath and change houses at the mines. (4) Prevention of indiscriminate spitting and the destruction of tuberculous sputum. (5) Definite treatment of those affected with tuberculosis of the lungs in an advanced form. (6) Improved housing conditions and disinfection of work-places and living-quarters. (7) The exclusion from work underground of all persons infected with tuberculosis of the lungs. The use of dust-preventing appliances is provided for under section 19 (m) of the Mining Act Amendment Act, 1910, viz.: "There shall at all times be used in and about the battery or place where such crushing or drilling is done an adequate jet or spray of water, or such other appliances as in the opinion of the inspector will effectually keep the air pure and prevent dust circulating in the place where such operations are being carried out, and for this purpose an adequate supply of water shall be provided." In addition to which it would be advisable that an approved waterblast be used immediately after blasting in mines, a provision made compulsory in the Transvaal for the purpose of allaying the noxious gases, smoke and dust caused by blasting in close ends. The use of a waterblast of the James type is recommended by the Transvaal Royal Commission. The more adequate ventilation of all mines to a standard of quality, quantity and fixed temperature is dealt with under the heading of "Ventilation" in this report. The use of bath and change houses is elsewhere recommended by us. The prevention of indiscriminate spitting appears to be a matter requiring urgent attention by local bodies and by the Government. The dissemination of directions regarding the destruction of tuberculous sputum is very necessary. Improved housing conditions for miners and the definite treatment of tuberculous persons are matters which are being strongly advocated by many medical practitioners of this Dominion. The exclusion from work underground of persons infected with tuberculosis of the lungs is a matter insisted upon by all authorities. We therefore make the following recommendations:—

PREVENTIVE MEASURES.

Every working-place where rock-drills are in use shall be furnished with an approved waterblast or suitable appliance for laying the dust, smoke and gases after a blast; and no man shall return to an end, rise, winze or other close place until the air is free from dust, smoke and fumes caused by blasting.

MEASURES OF RELIEF.

That miners suffering, or suspected to be suffering, from fibrosis or superimposed tuberculosis of the lungs shall have free medical advice from the Government, such advice to be given by a medical expert appointed for the purpose. That, in addition to the homes and sanatoria already established, adequate relief be provided from the Gold-miners' Relief Fund for those suffering from miners' phthisis, which for that purpose shall be subsidised £1 for £1 by the Government. The qualifications for the above measures of relief to be five years' residence in New Zealand immediately prior to the application for relief, two years and a half of which shall have been occupied in mining underground or working at a crushing-mill in New Zealand.

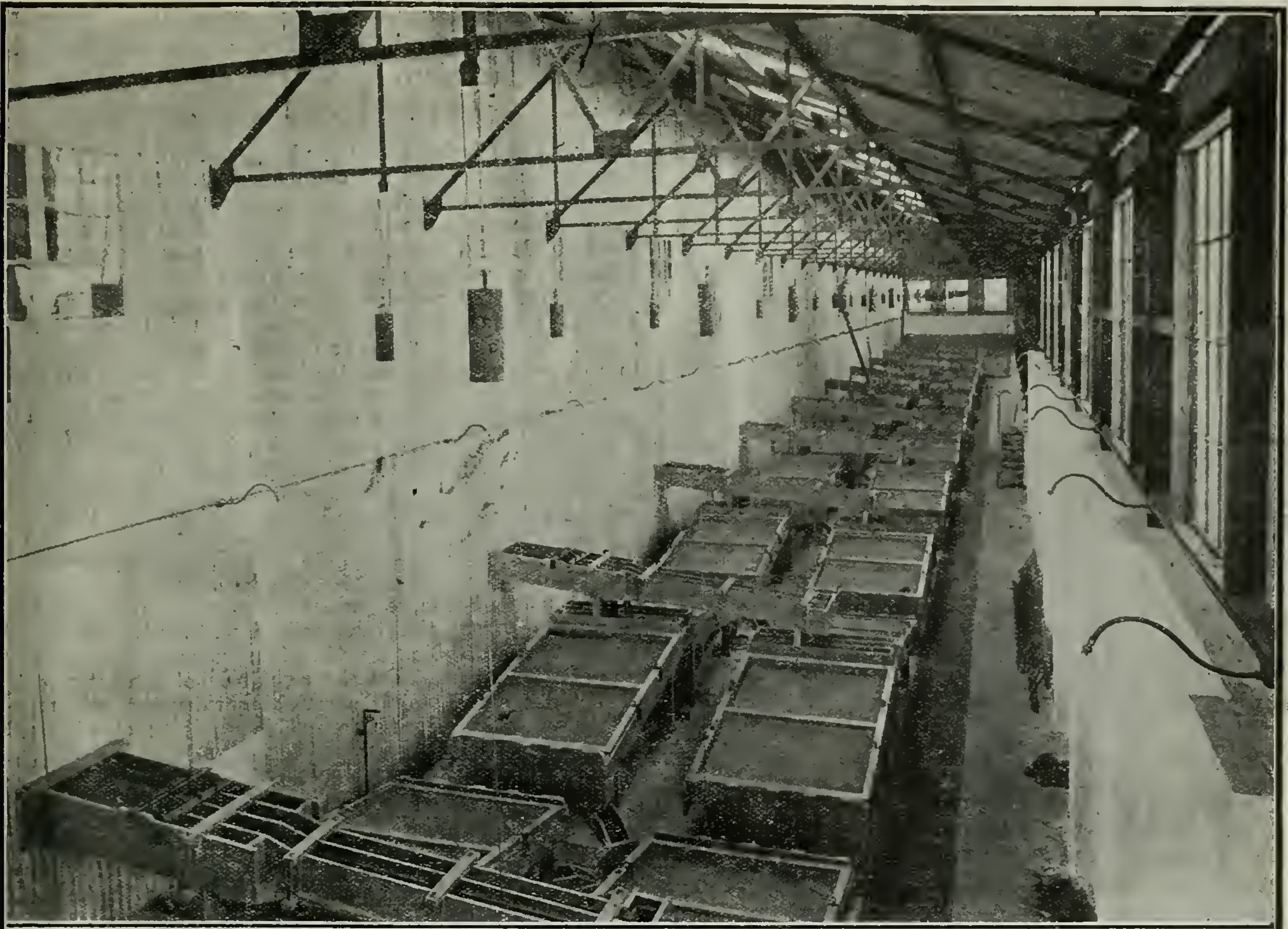
Jumpers-cum-Treasury.

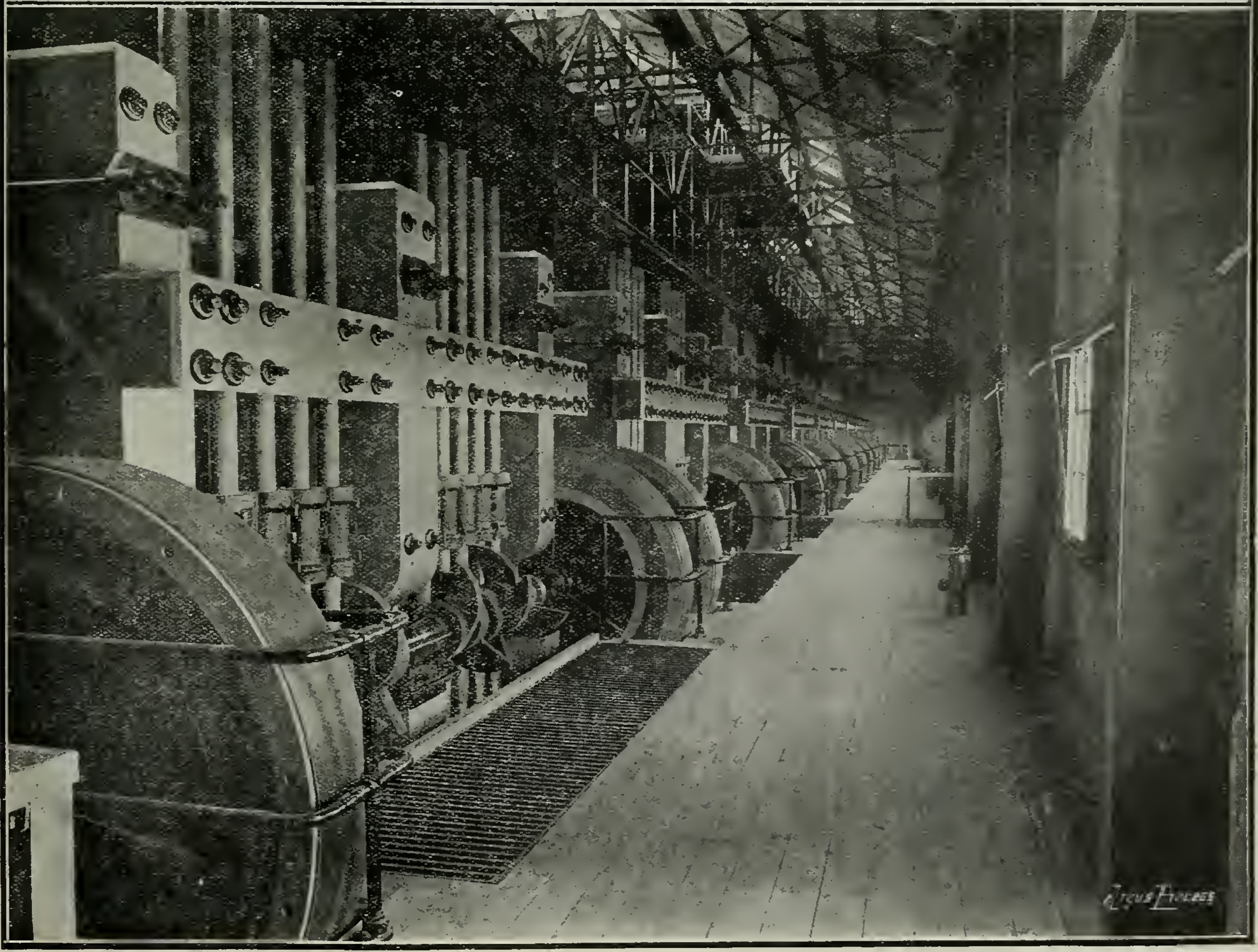
The following cable has been despatched to the London Agency of this company:—The following is the result of the joint working of the Jumpers and Treasury mines during last month: 75 stamps, working 25 days, crushed, 7,730 tons, yielding 2,162 ozs. of fine gold from mill, 1,070 ozs. of fine gold from tailings and cyanide, 330 ozs. of fine gold from current slimes, 194 ozs. of fine gold from accumulated slimes; total from all sources, 3,756 ozs. of fine gold; value of output, £15,775; joint profit for the month, £2,000; positon of gold reserve at the end of last month, 923 ozs. of fine gold.

Modder Deep Levels.

The secretary writes: I am directed to hand you herewith for publication the following particulars of work done on the property of the above-named company during the quarter ended 30th June last, viz.: Shafts Nos. 1 and 2 were sunk to the respective depths of 2,805 feet and 2,513 feet, the bottom of shaft No. 1 being in quartzite formation and that of shaft No. 2 in dyke. It is estimated that the reef should be cut in the No. 1 shaft at a depth of about 3,000 feet, this greater depth as compared with the original estimate of 2,750 feet being due to a steepening of the strata. The dip of the strata is 11 degrees.

CONSOLIDATED LANGLAAGTE NEW MILL.



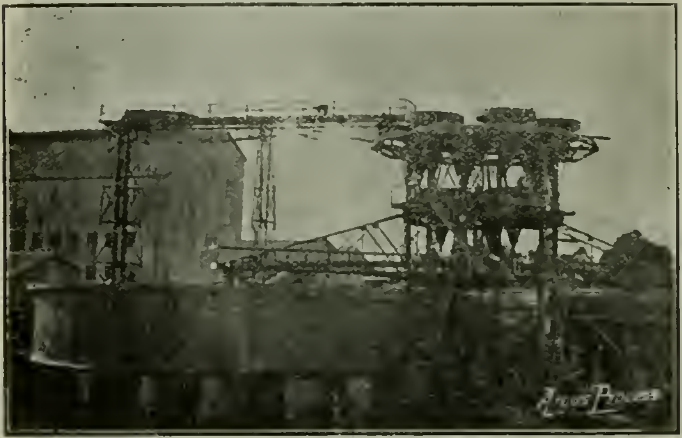


1. Plate House, Consolidated Langlaagte New Mill. 2. Cam Shaft Floor.

LANGLAAGTE CONSOLIDATED NEW REDUCTION PLANT.

Some Prominent Features—Classifier Plant, Plates, and Cam Shaft Floor—Segregation of the Clean-up and Smelting Department.

THE accompanying photographs show a few among the special features of the Consolidated Langlaagte new reduction plant to which reference was made in our issue of the 8th June last. The most striking, perhaps, is the sand collecting scheme. The series of classifying diaphragm cones, nine in number, of which six are erected upon the uppermost platform and three upon the next below it, in the steel tower-like structure which stands at the south-eastern corner of the mill, form perhaps the most prominent objects in the whole works. The final pulp from the secondary cones in the tube-mill house is pumped up the pipe on the left hand of the plant, through a height of 65 feet, to the upper cones. The underflow from these cones is divided between the three lower ones, and a thorough washing of the sand is thus effected. The slime passes away to the left along a launder to the slime plant, after passing through a set of four return sands classifiers, through which, also, passes the overflow from the sand collecting tanks. There are three of these, arranged radially around the cone tower. The sand, it will be observed, flows along launders to a distributor at the centre of each tank. Below the tanks will be seen the arrangement of three conveyor belts to each, which deliver in turn to a cross belt and thence to a Blaisdell distributor at the sand plant, which is situated to the right of the picture. As we were informed by the general manager, Mr. Payne, it is hoped to produce a separation of the pulp into 60 per cent. slime and 40 per cent. sand.



CONSOLIDATED LANGLAAGTE SAND COLLECTING PLANT

THE PLATE HOUSE.

The plate house, to which entrance is obtained by a single door from the tube mill department, contains 40 plates, each 5ft. 3in. by 4ft., four to each tube mill, in pairs back to back. On the right side of the interior will be noted a small staircase which provides the only means of access to and egress from the adjoining clean-up and smelting room.

CAM SHAFT FLOOR.

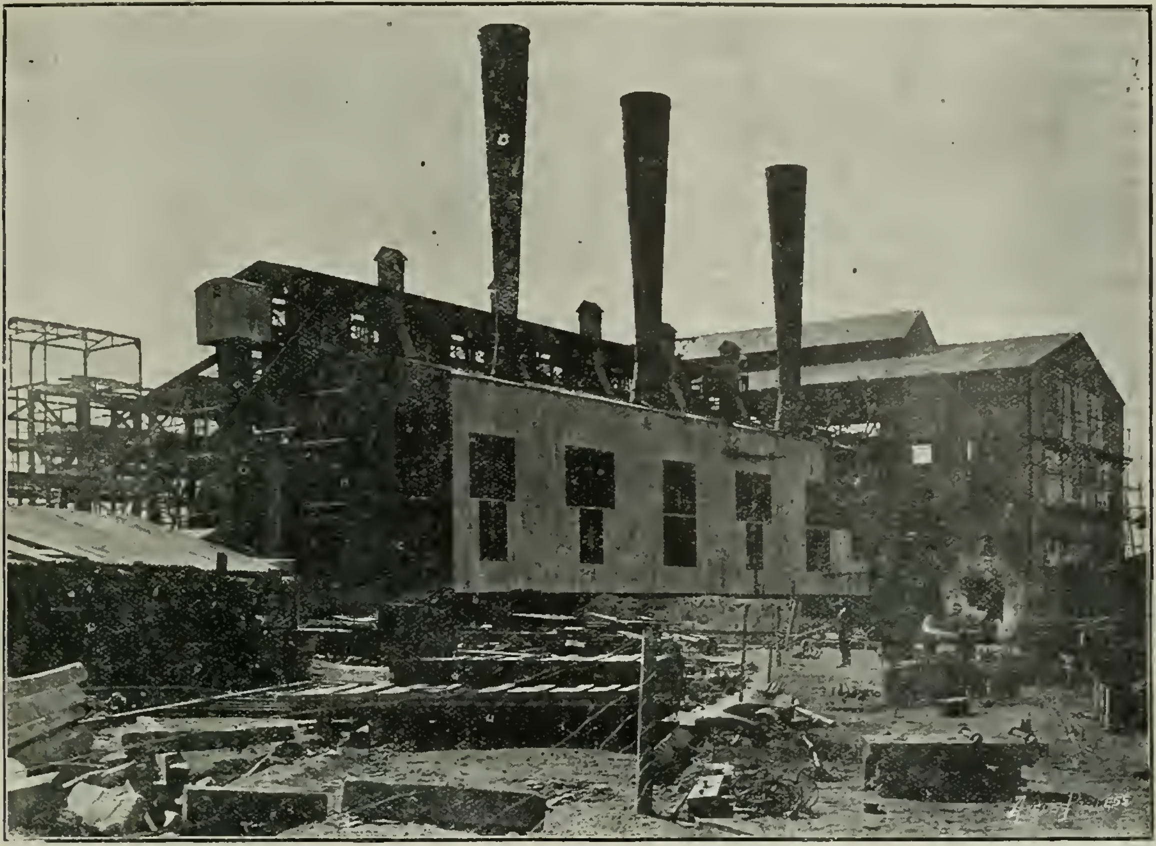
The feature of the cam shaft floor is its convenient roominess. There are 100 stamps in line, in units of 10, with three king posts to each unit, 5 cams to a shaft, and a separate motor drive for each pair of shafts. The stamps weigh 1,000 lbs., the battery being furnished by Messrs. Fraser & Chalmers.

THE VEREENIGING POWER STATION.

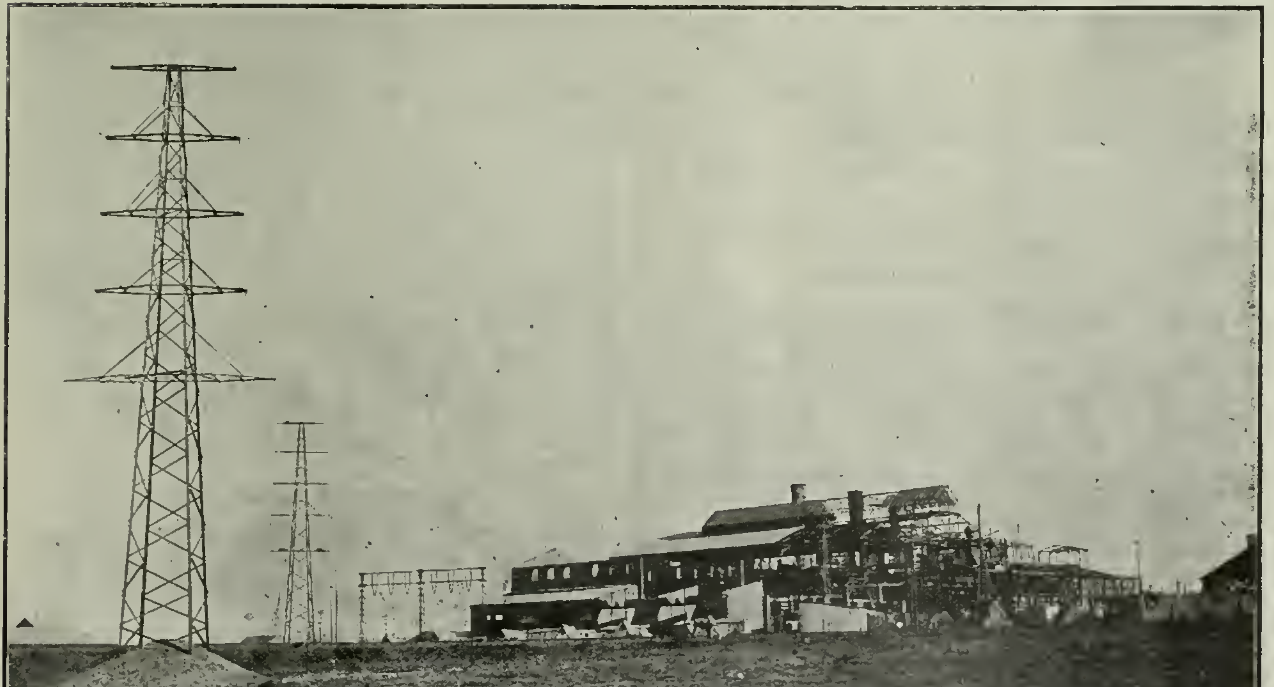
The Fourth Station of the Victoria Falls and Transvaal Power Company—One of the Largest of the Group—To Supply Current this Year.

THE new electric power station of the Victoria Falls and Transvaal Power Co., Ltd., which is now under construction upon the north bank of the Vaal River at Vereeniging, is the fourth of the great power stations to be erected by this company in the Transvaal for the purpose of supplying the requirements of the Witwatersrand mines. It is situated near the railway bridge which joins the Free State and the Transvaal, and forms a prominent object in a scene which has for many years been distinguished by the many evidences of industrial activity and progress to be seen in almost every direction. Eventually it will be one of the largest of the generating stations owned by the company, and will, therefore, be one of the largest in South Africa. The plant at present being laid down comprises two boiler houses, each containing ten Babcock and Wilcox marine type boilers, each being capable of evaporating 36,000 lbs. of water per hour and supplying steam at 220 lbs. pressure, superheated to 350 degrees centigrade, to four A.E.G. Curtis turbo-alternators. Two of the latter are rated at 12,000 K.V.A. and the remaining pair at 18,000 K.V.A., generating at 5,000 volts. An accompanying illustration shows one of the boiler houses nearly completed and the other with steel framing only in place. At the right hand, projecting beyond the end of the boiler house is the turbine room, which, it will be seen, is admirably lighted from the end, as well as from other parts of the structure. The situation at Vereeniging, some 35 miles south of the Rand, being determined by the proximity of an ample water and coal supply—the two essentials of a power station—there is necessitated a considerable transmission scheme to bring the power up to the Rand. For this purpose the pressure is stepped up to 80,000 volts, each set having its own transformer, and transmitted by duplicate overhead lines hung by means of suspension insulators from lofty steel towers, the spans being approximately 480 feet; and is protected at both ends by the latest devices for warding off the effects of lightning and kindred troubles. The switches controlling the lines are placed two in series with a resistance inserted according to the best modern practice, and are electrically operated by remote control. The lines, which are already practically completed, are connected on to the company's system at Robinson Compressor Station, where a new 80,000 volt transformer house has been erected. There the pressure is again transformed for distribution, being paralleled with the existing extension network all along the reef. It is expected that the new station will be supplying power in a few months' time.

THE VEREENIGING POWER STATION.



A Boiler House at the Vereeniging Power Station.



General View of Vereeniging Power Station in Process of Construction.

THE QUESTION OF UNDERGROUND TEMPERATURES.

Some Valuable Statistics—Comparison of Rand and Australian Conditions.

In the course of their report, the New Zealand Mine Commissioners state that in deep metal-mining operations it is sometimes necessary to circulate a larger volume of air than is required to produce, from a quality standpoint alone, adequate ventilation. For the purpose of reducing the temperature of the rock-surfaces a greater volume of air is necessary, for if this were not effected hard work would be either intermittent or unbearable in the heated atmosphere of many deep and hot mines, in which class those of the Hauraki Goldfield in this Dominion must be included. Observations made with the object of determining the rate of increment of temperature with depth in several countries where deep mining is conducted have shown considerable divergence in different places, as will be seen from the following comparisons of the results of temperature observations:

Locality.	Depth required for an increase of 1° F. Feet.
Comstock, U.S.A.	33
Witwatersrand, Transvaal	208
British Collieries (mean)	64
Bendigo, Victoria	77
Ballarat, Victoria	80
Thames, New Zealand	43·5
Waihi, New Zealand (approximate)	32·8

The relative rock-temperatures at the 1,000 feet level at Thames and at Comstock are 83° Fahr., and at Waihi approximately 85° Fahr., but it was found that, owing to various causes, the temperature throughout the Waihi Goldfield at any particular horizon was by no means constant. During the investigations the Commissioners found that the air in the working-places at Waihi and Thames was highly saturated, generally to the extent of 90 per cent. or more, and that the wet-bulb temperature of the air in working-places ranged between the following limits at the deepest levels:—

	Underground. (Wet Bulb).	Outside in Shade (Dry Bulb).
Thames Goldfield (1,000ft. level)	70·0° to 83·5°	55·0°
Waihi Mine (1,000ft. level) ...	61·0° to 82·5°	56·5°
Waihi Grand Junction Mine (944ft. level)	64·5° to 83·0°	55·0°
Waihi Extended Mine (960ft. level)	79·5° to 89·0°	50·0°

On the Reefton Goldfield the rock-temperatures are not nearly so great, the highest temperature recorded—viz., 78° Fahr., wet bulb—being obtained at the 1,266ft. level in the Progress Mine. To reduce excessive temperature and to cause an appreciable current to circulate through the heated stopes of the mines, an increased volume of air is necessary, but the extent to which underground temperature may be reduced by this means is somewhat limited, as our investigations have proved. The rate of increase in temperature of the outside air when conveyed into deep mines is demonstrated by the following measurements taken by us. During our inspection of the Thames mines we ascertained by actual measurement that atmospheric air which entered a Roots blower at the surface, and was forced at a velocity of 10 feet per second through a thin galvanised-iron 22in. air-pipe down a vertical shaft 1,000 feet in depth, and along a crosscut 670 feet in length, increased in temperature in the space of 2 minutes 47 seconds from 55° to 76° Fahr, being at the rate of 7·64° Fahr. increase per minute. The temperature of the air surrounding the pipe did not exceed 81° Fahr. At the Waihi-Grand Junction Mine we found that the temperature of the air, while passing from the top to the bottom of a vertical downcast shaft 955 feet in depth, increased at the time of measurements from 51° to 56° Fahr., the velocity of the air being at the rate of 16 feet per second. In this case the temperature of the air in the shaft increased at the rate of 5° Fahr. per minute. The return air in the fan passage at the surface of this mine was 69° Fahr. (completely saturated). From the foregoing examples it will be noted that in the North Island of New Zealand, where the outside temperature is equable (the mean surface temperature at Waihi being 55·7° Fahr.), the temperature of the air descending into the mine will have attained that of the rock-surfaces within seven minutes of entering the shaft. In discussing the effect of high temperatures on miners, the British Royal Commission on Mines (1909) reported as follows: "The influence of high temperatures on men is intimately dependent on the moisture in the air, and also on its motion, for the greater the dryness of the air and the greater its motion the more rapidly does warm air carry off the heat of the body and thus neutralise the ill-effect of the heat. The existing evidence indicates that in still and saturated air continuous hard work is practically impossible at temperatures exceeding about 80° Fahr., even when men are stripped to the waist, and that when the air-temperature is higher than this the result is the same if the wet bulb temperature rises about 80° Fahr. A temperature of 100° or 110° Fahr., with the air so dry that the wet-bulb temperature is only 80°, is thus no worse than air completely saturated with moisture at 80° Fahr. In other words, it is the wet-bulb temperature, and not the actual temperature of the air, that matters to a man when the air-temperature is high. In moving air, however, a somewhat higher wet-bulb temperature can be borne than in still air. At wet-bulb temperatures exceeding about 80° Fahr., the amount of continuous work which a man is capable of doing without serious rise of bodily temperature rapidly falls off and becomes practically nothing at 90° wet bulb."

The report adds:—"As a result of our investigations and deductions from the foregoing evidence, we are of opinion that, to secure a continuous distribution of the air in metal-mines adequate to reduce the temperature in hot working-places within reasonable limits, a standard or fixed temperature of 80° Fahr., wet bulb, should not be exceeded, unless it is not reasonably practicable to maintain the air at such standard, in which case a reduction of the hours of employment should be provided for. In three of the Australian States fixed standards of temperature are now provided by law, as follows: West Australia—Temperature not to exceed 80° Fahr. wet bulb, or 87° Fahr. dry bulb, without permission of inspector in case of impracticability. Victoria—Temperature not to exceed 83° Fahr. wet bulb, without permission of inspector in case of impracticability. Queensland—A reasonable limit of humidity shall be maintained, viz., at a temperature of 85° Fahr. by the dry bulb, the wet bulb should be at least 5° less, and in case of a higher temperature from 7° to 8° less.

New Kleinfontein.

The following are the results of operations at the New Kleinfontein mine during June: 220 stamps ran 28 days; 49,300 tons milled; 17,001 fine ozs. output; £71,246 value, less cost of realisation; £48,208 working costs; 19s. 7d. working costs per ton; £23,038 profit; £4,948 capital expenditure.

Brakpan Mines.

The following are the details of operations with respect to the June output of Brakpan Mines: 150 stamps ran 28 days, crushing 55,123 tons; 6 tube mills; ore hoisted, 62,323 tons; ore from dump, 1,400 tons; waste sorted out, 15·07 per cent.; fine gold declared, 21,089 ozs.; value declared, £88,983, equal to 32s. 3d. per ton milled; working costs, £48,179, equal to 17s. 6d. per ton milled; working profit, £40,804, equal to 14s. 9d. per ton milled.

CHANGED FINANCIAL POLICY AT THE NIGEL.

Brighter Outlook Encourages the Board.

THE general position of the Nigel has engaged the close attention of the directors since the annual meeting held in March last, and they have decided to take the earliest opportunity of informing shareholders that it is considered desirable to introduce a change in the financial policy of the company during the next twelve months. The desirability of freeing the company from debt and placing it in a secure financial position is obvious, and with a view to the attainment of those ends the board have decided:—Firstly, to discontinue the practice of setting aside £1,000 monthly out of profits in reduction of extraordinary capital expenditure. Secondly, to declare a dividend of 5 per cent. at June 30, 1912, and continue that rate of distribution half-yearly until all liabilities are liquidated, which should be before June 30, 1913, after which date the whole of the profits will be available as dividends. This change of policy has been adopted for the following reasons: (*a*) the extraordinary capital expenditure account, in reduction of which the directors during the past few years have allocated the sum of £1,000 monthly out of profits, has been reduced from £76,000 to £28,000, and the assets represented by that amount now stand in the books at below their actual value; (*b*) the manager advises that his estimate of profits, namely, an average of £4,000 monthly, can be maintained; (*c*) on account of the improvement of conditions at the mine, where development is proving much more satisfactory than for some time past. The outlook all round is certainly brighter, and the directors are confident that the adoption of the new policy will greatly strengthen the position of the company, and they hope their decision will commend itself to shareholders.

THE GEOLOGY OF THE WITWATERSRAND.

The Necessity for Sound Scientific Discussion.—Defects in Mr. J. S. Olver's Methods and Deductions—A Critical Causerie.

[BY "RHINESUCHUS."]

THAT those who set out to study geological phenomena, and who propose to make use of them as a basis for inductive and deductive reasoning, must, of necessity, be possessed of certain mental qualifications, in addition to other preliminary requirements—a sincere love of truth and a habit of industry and pertinacity, to wit—will doubtless be admitted by everyone. It is unnecessary, perhaps, to describe these mental qualifications at length, and, in any event, it is outside the purpose of this article. They may be summed up in the phrase, "the scientific instinct," and those who care to know more about them may read with advantage an admirable little essay by Professor J. Arthur Thompson, M.A., under the title of "An Introduction to Science," in the Home University Library series. Last, but not least, it may be added that practical experience is a factor of no inconsiderable value. The discussions which have taken place in connection with Dr. Mellor's papers upon the Geology of the Lower Witwatersrand tend to show that, although there is sufficient evidence of honest intention and undoubted proof of persistent industry in the field, there is little of that really scientific condition of mind without which the rest is of little avail, and not a striking amount of practical geological experience. The discussions have been terminated at the meetings of the Geological Society, *pro tempore*, at any rate, but they have been continued in the columns of the *S.A. Mining Journal*, and have reached what may be regarded as a magnificent climax in the throwing down of challenges under several headings by Mr. John S. Olver—challenges to a debate upon the merits or demerits of his particular theories. Although it is to be desired that one or more will take up the gauntlet, if only in the hope that additional evidence of a reliable kind may be presented, one can scarcely be surprised if there should be some hesitation in beginning a course of argument which, if it follows the lines already taken by Mr. Olver, may well go on for ever. It was, possibly, some such reason as this that led to the decision of the Geological Society to decline to publish his last contribution, added to the view that no new facts had been brought forward for consideration. In order to encourage a thorough investigation of his theories, a matter that involves no small amount of time and labour, it is necessary that Mr. Olver should provide his critics, or possible critics, with some more convincing evidence than he has so far presented, that he is really competent, in the full sense of the brief remarks at the beginning of this article, to give an authoritative sort of opinion upon points of geology. In other words, he must show some unmistakeable sign of that trained "geological instinct" that has already been referred to. One finds it neither in his little book on "Faults and Dykes" nor in his subsequent statements in debate in the pages of the *S.A. Mining Journal*. An extensive acquaintance with the movements and structure of faults and dykes in the mines of the Rand, such as is shown in the first part of the extremely interesting little volume mentioned, does not imply a capacity to sit in judgment upon geological problems of a different and much more varied kind in the field.

A DOMINATING THEORY.

In a chapter upon "The Main Reef Series" in the volume referred to, the author, in dealing with the Rietfontein puzzle, says:—"Now the author, some three years ago, formed a theory which seemed at first sight to explain satisfactorily the isolation of Rietfontein. His knowledge of the general geology of the Rand, outside the mines themselves, was at that time extremely limited. He set to work, however, to make a study of the area lying between, and for some distance beyond, Rietfontein on the east and Witpoortje on the west. The task has been a big one, but the original ignorance has proved to be an advantage in the long run. The work was always directed by the first broad theory, and the investigator was able to make an independent study, unhampered by the tendency to follow the lead of accepted authority. Difficulties were several times met with which appeared at the moment to be insuperable, but a reconsideration of the main theory always led to a renewal of faith in it; and the task was taken up again and again, with the result that every serious difficulty has been finally removed, and the author can now place his reading of the geology before the public with the utmost confidence, and with a degree of completeness to which he scarcely hoped to attain. . . . The author's method of working, as has been pointed out in an earlier chapter, is a dangerous one when used by careless workers, because it lends itself to the twisting of facts to suit the preconceived theory." An inexperienced worker is likely to fall into pretty much the same sort of dangerous position as a careless one under the influence of methods like this, and one can scarcely resist the conclusion that Mr. Olver has fallen a victim to overconfidence in himself. The all-powerful inspiration of the "broad theory" he speaks of so admiringly and reverently is apparent in every line, one might say, of his chapter on "The Main Reef Series" and the later chapters of his book, no less than in the whole of his subsequent discussions upon the geology of the Lower Witwatersrand. In his remarks with regard to "The Northern Main Reef" theory, conceived and promulgated by him, we find it stated, *inter alia*, "Whether the author's theory with regard to a northern outcrop of the Main Reef Series is sound or not can only be proved by actual boring operations, but it can be confidently claimed that the balance of evidence at present available is overwhelmingly in favour of the theory. The author is not, in fact, aware of a single piece of material evidence which points to an opposite conclusion. His study of fault problems has taught him that the potentialities of faulting are almost infinite, and that it is impossible to guard against every source or error in a problem as large and intricate as the one under discussion. He puts forward his solution, however, with a large degree of confidence; and he will welcome the most searching examination of his evidence, and the most remorseless, if honest, criticism of his deductions." It would be difficult to express reliance upon his own methods of investigation more emphatically, and yet within a few weeks this apparently well-balanced edifice of assumption was admitted by its builder himself to be unable to stand up. There is no intention to be sarcastic or to jeer in making this reference, because Mr. Olver's manly and honest attitude in regard to the withdrawal of the theory is deserving of admiration and warm approval. At the same time, if one overwhelmingly supported theory turns out to have been unworthy of serious acceptance, is it not probable that others formed upon a similar basis of reasoning and method may be equally undeserving of sustained and careful investigation.

Some Conflicting Views.

To take another instance of Mr. Olver's habit of thought; on p. 105 of "Dykes and Faults," there appears a diagram, Fig. 42, which raises the question of the movement of rock over irregular surfaces under pressure. On p. 109, he remarks in reference to this figure:—"It might seem impossible that the portion of country on one side of an irregular line such as E.C.G. in Fig. 42 should be moved in the direction of the arrow, and yet continue to lie closely against the country on the other side of the fault. Yet there appears to be no doubt whatever that such movements often occur. One is, therefore, forced to the conclusion that rocks are, or have been, far more elastic or more pliable than one is apt to suppose. An otherwise similar movement which has not been followed by the pressing together of the fault faces may explain the occurrence of dykes which vary greatly in thickness, and which are sometimes thinned down until in places they cannot be distinguished from ordinary faults. The dyke matter may have filled up cavities left along the irregular plane of the fault. Unless one realises the pliability of rocks, one is disposed to think it impossible that two faults, converging along planes which differ considerably in strike and dip, can combine without checking the movement along one of the components. Yet it is certain that faults with sharply divergent planes do sometimes unite. . . . It becomes easier to understand the power of rock masses to bend and adjust themselves to meet the altered conditions produced by movement when one realises the extreme slowness of the movement and adjustment."

In the articles which have appeared recently in the *S.A. Mining Journal*, Mr. Olver appears to repudiate this idea of the pliability of rocks altogether, and he devotes a large portion of the articles to an endeavour to disprove the possibility of a condition of things which is only partly suggested in Dr. Mellor's diagrams relating to the thinning of the beds observed by him along the south side of the Bezuidenhout Valley. On p. 651 of the issue of the *S.A. Mining Journal*, dated the 29th June last, Mr. Olver enforces his argument against compression by quoting the action and reaction between a pair of nut-crackers and a nut. If, after having read his remarks upon the matter the reader will turn to pp. 90 and 91 of "Dykes and Faults" he will find a section and plan of a fault in the Chimes portion of the New Kleinfontein mine which show conditions that are certainly not in accordance with the author's nut-cracker argument.

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"Scientific Thinking."

A final illustration of Mr. Olver's process of thinking may be quoted. On p. 426 of the issue of the *S.A. Mining Journal* of May 18th he draws an analogy between the existence of an unseen fault and the passage of a train through a tunnel. If, he says in effect, Dr. Mellor saw, emerging from one end of a tunnel, a train which was similar in every respect to one which he had observed entering the other end, would he, circumstances being normal, "think it an unwarrantable flight of imagination to suppose that it was the same train?" In the same way, then, if a fault is found entering the Jeppestown beds at the Princess Estate, and a fault is found emerging from them near Jeppestown, is it not reasonable to assume, conditions generally being favourable, that the faults are portions of one that continues through the whole distance. The difference between these illustrations is that while we know the tunnel exists we have no information whatever about the fault. It is a very great difference indeed, and quite destroys the validity of the tunnel as a basis for analogy.

The substance of Mr. Olver's articles and his statements generally have not been brought into consideration so far. It has seemed desirable to point out first of all that his theories and contentions do not come before us with those credentials of sound methods of investigation, cautiousness in their mode of expression, nor with that degree of consistency which might warrant the attention he almost demands. Nevertheless, some of his evidence is well worth attention, on the grounds that even error may serve a useful purpose; and it is not certain, of course, that all his views are erroneous.

THE BENONI—APEX AMALGAMATION PROPOSALS.

Report by Mr. C. D. Leslie—The Relative Position of the Two Companies—Conclusions and Suggestions.

The following is the text of the report made by Mr. C. D. Leslie, Superintending Engineer of the Consolidated Gold Fields, upon the relative position of the properties concerned from the point of view of a proposed amalgamation of interests. The terms of reference were mentioned at the meeting of the Apex and Benoni companies, which appeared in our last issue. The inherent interest of the report will be increased by the fact that it is the first of its kind that has, so far, been published *in toto* in any Rand paper.

Benoni Consolidated Gold Mines, Limited.—The mine is divided into three approximately equal sections, each having separate shaft equipment from the surface. Owing to unpayable reef disclosures in the western section development was abandoned there, and confined to the central and eastern sections, where it is estimated there are fully developed some 553,700 payable milling tons of an average assay value of 5.9 dwts., and, in addition, some 14,000 milling tons of partially developed ore of an indicated average value of 5.5 dwts., or a total of 567,700 milling tons of an average value of 5.9 dwts. Excluding as unpayable some 50 reef claims on the western portion of the western section, it is estimated that the mine contains 4,500,000 milling tons of payable ore of an average value of 5.9 dwts. The payability percentage of the claims included in this estimate works out at 58 per cent. Development has been confined chiefly to Main Reef, where disclosures indicate on the upper division of the property ascending values from west to east, and also ascending values on the lower division towards the southern (Van Ryn Deep) boundary. In the eastern section exposures in crosscut raise from the Main Reef, while proving the existence of payable areas on what is termed the Upper Main Reef, show the presence of low-grade ore on this reef in the lower levels, and in those approaching the central section of the property. Exposures on the Main Reef Leader overlying the Upper Main Reef have not shown payable values. Certain expenditure would have to be incurred to bring the tube mill, sand and slime plant into line with the capacity of the sorting and crushing plant and stamp mill, to provide adequately for the treatment of 30,000 tons of ore per month.

Apex Mines, Limited.—The intention was to sink two seven-compartment vertical shafts on this property, but the South Shaft was stopped at a depth of 107 feet, and the North Shaft only was continued, and intersected the reef at a distance from the surface of 1,720 feet. From the north vertical an incline shaft is being sunk southwards near the plane of the reef, at an angle of 11 degrees 30 minutes, in a direction which ultimately would have connected with the south vertical shaft, had the latter been proceeded with. This incline shaft was laid out skilfully so as to command the work to be undertaken on either side of it. On this large property development, which is confined to the Main Reef, covers only a small area on the northern side, being on the immediate dip of the western portion of the Benoni Consolidated Gold Mines. The fully developed ore reserves are estimated at some 220,800 milling tons of an average assay value of 5.9 dwts., per ton, and in addition there are some 91,100 milling tons of partially developed ore of an indicated value of 6.3 dwts. per ton, or a total of 311,900 milling tons of an average value of 6.0 dwts. per ton. It is estimated that the mine contains 14,300,000 milling tons of payable ore of an average value of 6.0 dwts. per ton. Taking into consideration the large extent of this property, the comparatively small amount of development accomplished and the information from disclosures in surrounding properties, it will still be seen that in calculating the total ore contents and value, exhaustive data could not be obtained. 65 per cent. of the tonnage is estimated as being payable. Subsequent disclosures indicate that the Apex Mynpacht was located with excellent judgment. The northern portion of the property is bounded on the east by the Brakpan Mines, where the considerable area already developed is approximately parallel to its boundary, and where the highly satisfactory values disclosed in early development are persistent also in the lower levels. It is worthy of note that the Apex western development, which is the furthest removed from Brakpan, has disclosed satisfactory reef width and value.

Apex and Benoni Combined Property.—It is estimated, as above, that the Apex and Benoni properties contain 18,800.000 milling tons of an average value of 5.976 dwts. per ton, and it should be stated that, in arriving at these figures, due weight was given to the reef widths and values met with in adjoining properties. The ore is characteristd by fluctuations in value over short distances. On this account, though it will be possible sometimes to stope around unpayable patches of reef which may be encountered, it will happen frequently that such patches will be stoped through, wholly or partially, so as to advance stope faces to richer ground beyond. There is evidence also that stretches, not always disclosed in development, of foot and hanging wall ore of low grade, which can be dealt with at a profit, will be met with and mined as stoping proceeds. In addition it might be anticipated that from blocks of ground previously excluded from ore reserves as unpayable, small areas of payable reef will be discovered and mined.

Recovery.—I estimate the average ore to mill as follows:—80 per cent. from ore reserves, at 5.976 dwts. per ton; 6 per cent. from development, at 3.000 dwts. per ton; 14 per cent. from ore as referred to in the preceding paragraph, at 4.500 dwts. per ton. Total, 5.591 dwts. per ton. Taking the average residue value at 0.3 dwt., an average recovery value is arrived at of 5.291 dwts. (22s. 2.7d.) per ton milled.

Working Costs.—On a milling basis of 40,000 tons per month, as prescribed in your letter of the 2nd instant, working costs are estimated at 19s. per ton for the first year, 18s. per ton for the second year, and 17s. 6d. per ton milled thereafter. The allowances for the first two years are by way of provision to get the plant and equipment into final tune, and to secure everywhere white and coloured efficiency and harmonious running. It is assumed that before crushing begins all connections between levels on payable reef will be opened out conveniently for stoping, and that the stopes will be equipped with such conveyor plant as may be considered suitable for removing broken ore to levels. The mine should start work with a full equipment of rock drills and accessories, drill steel, trucks, tipplers, tools, etc., and also such air and water services as are required in each working place. The cost of development work required to replace ore extracted from the mine is included in working costs, but shaft sinking, additions to plant, and also renewals of an extraordinary nature outside ordinary maintenance work are dealt with as a separate deduction from distributable profits. In estimating upon capital and running expenditure after the start of milling, results actually achieved elsewhere are taken into consideration, weight being given to variation of conditions such as reef width, percentage of payability, breaking quality of rock, and convenience for handling it, depth and accessibility of working, capacity, centralisation and condition of plant, etc. The Apex-Benoni has what might be termed on the Rand easy ground for breaking, and has excellent facilities for economic centralisation of surface plant. It is assumed that all plant to be erected will be designed with special attention towards taking full advantage of the best methods prevailing on these fields for dealing with the work and for labour saving, and also towards low maintenance cost in the future. In determining the amount of profit to be derived from the gold contents of ore on the Apex-Benoni property, capital expenditure and working costs are based upon the assumption that there will be no material change in working conditions. and that ordinary good management will prevail. On a milling basis of 40.000 tons per month the Apex-Benoni combined property would have a life of approximately forty-six years, and over such an extended period it would be reasonable to anticipate that the expenditure on capital account and running costs as estimated upon would be reduced. It is not clear to me, however, that I am justified in hazarding a prediction as to what that reduction should be owing to uncertainty as to future treatment for the mining industry by the Government of this country, and therefore I have refrained from making allowance for it.

Underground Expenditure to be Incurred.—As stated in your letter of the 2nd instant, a minimum of £215.000 will be available for shaft sinking and equipment of incline shafts, development and the proposed connection between the Apex and Benoni west shaft. I am satisfied that during the time allowed (twelve months) the underground work can be accomplished in a way that will be in accord with a desirable plan for the continuation of development in the future, so that there will be sufficient stoping faces to maintain on day shift only a monthly rate of crushing of 40,000 tons, provided a rate of development to replace the payable ore extraction is continued from the time crushing commences. It is estimated that the ore reserves would then be brought up from 879.000 milling tons. as at present, to 1,750.000 milling tons. I consider that the £215.000 provided for this work should leave a surplus sufficient to pay for the preliminary stoping necessary before crushing commences, and also for the rock-drill and truck service required.

Relative Value of Benoni Consolidated Gold Mines and Apex Mines.—The estimate of average working profit to be obtained from the enlarged company works out at 4/8.142d. per milling ton. After deducting Government Profits Tax, and a reasonable annual allowance for capital expenditure and machinery renewals, the total present value of distributable profit amounts to £1,092.976. The following statement shows the distribution of interests in the enlarged company:—Present value of distributable profit in working (exclusive of sundry revenue) based on 6 per cent. interest and 3½ per cent. redemption of capital: Benoni, £254.211: Apex, £838.765; total, £1,092.976. Value of cash and cash assets, incline shafts, standing development and equipment, gold in plant, etc., after deducting cash liabilities: Benoni, £278,033; Apex, £371,306; total, £649.339. Total interests: Benoni, £532.244; Apex, £1.210,071. Grand total, £1,742.315. Proportion, 1: 2.2735. Note.—The Apex coal rights are not considered in the above statement. Taking a basis of 300,000 shares for Apex, as required in your letter of 2nd instant, the relative shares to Benoni works out at 131.955. Considerable importance should be attached to the loss resultant from running at an underload a large property like the Apex-Benoni, and as an instance, it may be stated that the existing Apex vertical shaft can be equipped to deal eventually with the full tonnage to be hoisted to provide 70,000 milling tons per month when it may be found inconvenient to use any of the Benoni shafts for the delivery of rock to the surface. Great importance also attaches to the enhanced present value of profits which would accrue from any increased rate of milling, and from decreased working cost per ton, when dealing with increased tonnage, after deducting the amount of additional capital expenditure which would be required. On a milling basis of 70,000 tons per month, it would be safe to estimate that there would be a reduction in operating costs of 1s. 3d. per ton, as compared with working at a rate of 40,000 tons per month. From several points of views it would be considered undesirable to prolong the life if this mine to about half a century by limiting the capacity of its plant to 40,000 tons per month, and I suggest the following as an alternative scheme to that proposed in your letter of the 2nd instant :—(1) That the Apex-Benoni be made a live concern as quickly as possible by starting milling as soon as the plant can be brought to a crushing capacity of 30,000 tons per month, as referred to in the early part of this report. (2) That plans and estimates be prepared for the plant and work necessary to increase the capacity from 30,000 to 50,000 milling tons per month, and that this further work be put in hand as soon as convenient. (3) That after crushing at the rate of 50,000 tons per month is established satisfactorily, the final stage of the programme be enteren upon by proceeding to bring the mine and plant to a capacity of 70,000 milling tons per month. In this way the first stage of production would be entered upon with the least possible delay, after which the cost of extending it would be curtailed, because the cost of production would bear a fair share of standing charges. Such a programme would give the mine a fair opportunity for gradually working up the best efficiency with the minimum of loss, and would be the means of reducing expenditure, which otherwise would have to be incurred. To avoid loss it would be a simple matter to lay down plant with a view to its ultimate extension. The proposed connection of the Apex-Benoni workings can be regarded as a feasible and good working arrangement, assuming that it is made of suitable dimensions for adequate ventilation purposes, and that any mechanical ventilation plant which may be installed there will not interfere with the use of the connection, either as a means of egress from the Apex section or for natural ventilation during periods when mechanical ventilation is not being employed. This connection should be continued on reef as far as convenient, so that it may help the development of the mine and admit of being widened out on reef. The combined use of the Apex seven-compartment shaft with one, or if need be, two of the Benoni shafts, aided by mechanical means for accelerating the passage of air, would obviate the necessity in the future of sinking the Apex south shaft for ventilation purposes. The large mines more or less in their infancy, which adjoin each other in this district might well consider the mutual benefit and protection to be derived in sharing in a general scheme for ventilation and the pumping of water, so that the separation of mines by boundary pillars might be dispensed with, not only on account of the improved ventilation which would ensue, but for other important reasons, such as the ore value of these pillars, and the convenience and economy which would result from having drives extended under arrangement from the neighbouring mines through and beyond the dividing boundary pillar. In this way the Brakpan and Apex mines might derive mutual benefit by the extension of development from the Brakpan Mine into and along the eastern boundary of the Apex property, which might locate a new favourable centre for development long before it could be reached in the ordinary course of progress. Convenient arrangements can be made for handling men, material and rock in the Apex section, and adequate rock storage can be provided to balance the capacity of the vertical shaft which can deal with the full burden, so as to dispense with the south shaft which, in my opinion, need never be sunk.

Conclusions.—On a basis of 40,000 tons per month neither the Apex nor the Benoni properties, worked independently, can be considered as being as sound a mining proposition as when worked conjointly. The position is materially improved by combining the properties and milling at the rate of 40,000 tons per month, and if this programme is carried out, I consider it reasonable to expect that my estimate of profit to be derived will be fulfilled. I have to state, however, that the value would be greatly enhanced if the combined property is worked at a rate of 70,000 milling tons per month, which I regard as the minimum ultimate capacity for this mine, which would then have a life of some twenty-six years. Reviewing the whole position, I arrive at the conclusion that the consolidation of interests on a basis of 300,000 shares for Apex, and 132,000 shares —or even 133,000, as indicated in your letter—for Benoni is fair and equitable, and that the arrangement, if carried through, will lead to a profit from mining which will reflect creditably on the transaction as being just and advantageous to all shareholders. I attach plan showing the position of the Benoni and Apex properties in relation with the surrounding mines.

The following is an addendum by Mr. J. W. Craig, Acting Superintending Engineer to the Consolidated Gold Fields:

In accordance with instructions received from Mr. C. D. Leslie, I beg to submit the following estimates based on the recommendations made on page 12 of his report dated 10th May, 1912, namely :—That crushing be started at the end of one year at the rate of 30,000 tons per month, and raised in stages to 50,000 tons and 70,000 tons. I have assumed that 30,000 tons per month would be crushed for one year, 50,000 tons per month for the next year, and thereafter 70,000 tons per month; and that the working costs will average 20s. for the first year, 17s. 9d. for the second year, 16s. 9d. for the third year, and 16s. 3d. thereafter. The assumption of working cost of 16s. 3d. for the bulk of the life, as against 17s. 6d. when estimating on a smaller crushing capacity, would have the effect of slightly reducing the pay-limit, and this might possibly result in some blocks being now within that limit that were formerly excluded from ore reserves. The net effect might be to slightly increase the estimate of life, with a corresponding decrease in grade, but the difference is so small that I have not considered changing the estimates necessary.

Distribution of Interests in Enlarged Company.—The statement on page 10 of the original report would read now :—Present value of distributable profit on working (exclusive of sundry revenue) based on 6 per cent. interest and 3½ per cent. redemption of capital : Benoni, £498,849; Apex, £1,632,489; total, £2,131,338. Value of cash and cash assets, incline shafts, standing development and equipment, gold in plant, etc., after deducting cash liabilities : Benoni, £278,033; Apex, £371,306; total, £649,339. Total interests : Benoni, £776,882; Apex, £2,003,795; grand total, £2,780,677. Proportion, 1 : 2.579278. (*Note* : The Apex coal interests are not considered in the above statement.) Taking a basis of 300,000 shares for Apex, as required in your letter of the 2nd instant, the relative shares to Benoni works out at 116,312. In arriving at the present value of the combined company it is necessary to deduct from the "Present value of distributable profit on working" the combined cash deficit, and the capital expenditure to be incurred on shafts, development, reduction plant, and general equipment, but I understand that you will yourselves estimate these amounts. Mr. Leslie estimates that there should be standing 1,750,000 pay tons when the mill starts, and the present value of this expenditure advanced on working costs represents a further asset.

THE CASE AGAINST THE CONTRACT SYSTEM.

Many Evils Induced by it—Forcible Condemnation by Recent Commission—How it Makes for Accidents and Disease.

The Minority Report of the New Zealand Mines Commission, written by the two Labour members of the Commission, has the following condemnation of the contract system and night shift:—" One of the most important questions which the Commission has been called upon to consider is that dealing with the prevention of miners' phthisis. While we think that some of the recommendations made by this Commission, when carried into effect, will mitigate the disease to some extent, we have learned from the evidence and observation that the two chief contributory causes of this malady are the contract system and the night shift. In many instances, apart from the cost in money, a great deal of time is wasted and numerous lives are lost in trying to deal effectively with certain evils without legislating to embrace the most important contributory causes, and hence we find we are dealing with the effect instead of with the cause. Although this question of the contract system was mentioned in the findings of the British Commission and recommended for consideration, we are basing our conclusions in this report upon the evidence gathered by the present Commission, which evidence undoubtedly constitutes a strong indictment of the methods in vogue. All the witnesses on behalf of the workmen admitted before the Commission that the contract work and night shift were responsible for bad health and the major portion of the accidents, notwithstanding that their earnings are a little larger under the contract system than under the day-wage system. Knowing, as the miner does, that his occupation is hazardous, dangerous and unhealthy, in order to launch out in some other avenue of employment, he endeavours to try and make a cheque, and takes full advantage of the time spent underground to accomplish the object in view. The result is we find the men impatient; the pace, as a rule, is set by the strongest man physically in the contract party, and each member of the party is expected to do the same amount of work, and in the attempt the last particle of energy is expended. Not only is the 'rushing' a cause of serious accidents, but, as a consequence of the hard nature of the work and the vigour with which it is sustained, the men themselves are frequently so tired that they spend the largest portion of their time in bed when out of the mine, which time should be devoted to exercise and health-seeking. When to fatigue is added severe strain, the effects may be lamentable, as, for example, the pushing of heavy trucks, each of which weighs from 1 ton to 25 cwts., and the lifting of heavy machines, which all tends to lower the vitality and wreck the constitution. The worn appearance of the men in those districts where these systems are in vogue is a practical exemplification of the loss of vitality. This was noticed by the members of the Commission at Waihi, and in order to ascertain the state of the health and condition of the men in general, they made a requisition to the Government to appoint a medical expert to join the Commission. We regret that the Government did not see fit to grant the request, for had this been done we feel sure the conclusions would have been more satisfactory. Dr. Conlon, in giving evidence before the Commission, said: 'The contractors are the men who suffer most; the good miners always go under quicker.' In answer to a question by the Chairman on the subject, he further stated that the more the men exerted themselves the more likely they were to get the disease, and the 'the men who worked hard frequently go away from the district because their health is affected. A man cannot work underground and extend himself as he can on the surface. If you look through a list of the men who have suffered from the disease you will find that they are the men who worked as contractors.' Continuing his evidence, in reply to a Commissioner, he said that the work lowers a man's vitality, and he runs into places without waiting for the dust to settle, thus taking bigger risks; further, that the average age of men dying in the Reefton district, during a period of twelve years and a half, would probably work out at fifty-five. We also quote valuable information by Thomas Oliver, M.D., F.R.C.P., from his work on 'Diseases of Occupation.' He quotes Dr. H. Bremridge, who is on the medical staff of the Kolar Goldfield, India, as follows:

> In the Kolar gold mines there are 40,000 coolies employed; the rock is hard. Dr. Bremridge went to India expecting to meet with miners' phthisis, but failed to find evidence of the disease except in men who came from the Transvaal. He found that the native and white men kept good health. He attributes the freedom from miners' phthisis partly to the fact that the men take more leisure, and are not so eager to make a fortune as the miners in the Transvaal.

" Dr. Oliver also says:

> The miners on the Rand are paid for piecework; they are impatient, and as they prefer to run risks some persons may say the men are not altogether to blame. They rush back too soon after blasting to recommence work in the particular part of the mine, the air of which contains a slight excess of CO_2 when the explosion has been complete, and always a large quantity of dust. They neither allow the smoke to clear away nor the dust to settle.

" These circumstances show the desire on the part of the men to run these risks in order to earn one or two shillings a day more, not only in this country, but in every other country where this system is in operation; and we are of opinion that the system is also responsible for the bad distribution of air, as the men do not seem to give any consideration to the ventilation, in case doing so may impede them in their work. They push on for footage and tonnage, which determines the amount of wages they receive, and thereby assist the companies in evading the provision of adequate ventilation. In many cases it is more economical for the companies to give a prize to the men than establish proper ventilation. We contend that any system which embraces a decoy for men to run risks underground—returning too soon after firing, etc.—is dangerous to health, limb and life. Circumstances show that the broken rock tends, after blasting, to imprison poisonous gases. The subsequent liberation of these becomes a source of danger when the work is carried on before the air of that vicinity is perfectly clear from dust and all poisonous gases. We have observed that accidents are far more numerous in the districts where mining is carried on under the contract system than on day wages. This was also observed by Mr. Coutts, the late Inspector of Mines for the Hauraki district. He is reported in the *New Zealand Mines Record* of the 17th January, 1902. He brought a charge against Pile and Perry, at the Warden's Court, of having committed a breach of the Mining Act by neglecting to tell their mates, who were relieving them on shift, as to an unexploded charge. Mr. Coutts pointed out that he had brought the present case forward as a warning, especially in view of the fact that there had been more accidents at the Waihi mine during the last six months than had been the case for ten years previously. He was sure these accidents were in a large measure due to the contract system, as the men went to work hurriedly and they left as quickly, and somehow there did not seem to be the amount of care exercised when explosives were being dealt with that was necessary. In our opinion this statement by Mr. Coutts (who had had years of experience) amply proves that the contract men do their work more hurriedly, and consequently more risk is incurred, and at the same time shows that more accidents happened for the last six months than had been the case for the previous ten years, considering the ten years mentioned was worked on the day-wage system. Here we quote Thomas Oliver again. He said, in regard to phthisis amongst Cornish tin-miners:

> Taking this view of the malady, tin-miners' phthisis can be to a large extent prevented by laying of the dust by water-spraying, by the men not returning too soon to the particular part of the mine after the use of explosives, and by care taken in removing the ore.

" This authority advises, not only in one place in his valuable work, but right through his book, that one chief factor in the prevention of the malady is for the men not to return too soon after firing, and our contention is that any system of work that allures men to run these risks is a danger to the men employed and a menace to the community. The night-shift, more commonly known as the 'dog-watch,' is abhorred by all miners, and is known to be an enemy to the health and vitality of the worker. It was unanimously agreed by the Commission that it was detrimental to the health of the worker under the most favourable conditions, and yet the majority did not feel disposed to recommend its abolition. According to the evidence, men become very nervous on this shift, owing to the broken rest and the unnatural times at which they are compelled to take their meals, and consequently they are not in a fit state to exercise that care which mining demands in dealing with dangerous grounds and the use of explosives. The night shift, especially when added to the contract system (which undoubtedly fosters the continuation of night shift and makes it more frequent), has a most injurious effect on a man's health, hence his constitution becomes run down and leaves the worker an easy victim to phthisis. Dr. Oliver said: 'When a man is low in vitality it predisposes him to disease.' "

MINING PROSPECTS IN THE LOW COUNTRY.

Some Interesting Information—Leydsdorp and its Future.

The Selati railway extension has now practically reached completion so far as the Gravelotte, a mine on the antimony belt of the Murchison Range and a point at which it is nearest to Leydsdorp, a small dorp of about a dozen and a half inhabitants, although the rails are laid and a good deal of the ballasting done up to the Letsetelai River, which is about twenty miles further on than the Gravelotte. The great drawback to this part of the country is water. There are few rivers, and the rainfall is very little, even during the summer, while, of course, during the winter we have none at all. With the advent of the railway things round the district are expected to make a great move. The cry has been for years past "when the railway comes things must move," this on the part of the prospectors and private people who for years past have been hanging on to claims on the chance of some of the up-country people or mining house engineers coming to take up ground. Certainly in the district there are good indications of both precious and base metals: mica, corundum, gold, and copper, but for years practically little or nothing has been done to prove the deposits as prospecting is a very expensive game to indulge in.

TRANSPORT DIFFICULTIES.

In the past this country had a great deal to contend with in transport difficulties. Goods, stores, and machinery purchased in Delagoa Bay made, one might say, almost a circular tour, having to be sent to Pretoria, on to Pietersburg, and then by wagon a further 120 miles. This difficulty is now finished with, as the railway runs right through the heart of the district and should not be more than 25 miles from even the most outlying propositions, while it runs through others. Also, in the past supervision was very difficult on the part of the people up-country, and things at the mines were often carried on in a loose manner, much of the prospecting work was left almost entirely to kaffirs, while the prospector was enjoying himself with the contents of a bottle. This is true of many, while others did good conscientious work. Along the Murchison Range there are several promising properties, although in the past there has been great difficulty in treating the gold carrying body—the Antimony Reef—it is now strongly rumoured that a process has been discovered by which the gold can now be readily and cheaply separated from the antimony, and if this rumour be true the Murchison Range should very shortly have a series of mines, as undoubtedly good gold values are carried in this antimony reef. A water scheme to bring the head waters of the Thabina and Letsetelai Rivers to the Murchison Range and surrounding country has been on foot for some considerable time past, and I am given to understand a private Bill has been brought before "The House" to authorise this scheme, which, if carried out, will wipe away the water difficulty which the Murchison Range also had to contend with. This scheme should also greatly benefit the flats of the Rooi water country, which rather belies its name, as although the soil is good and it is otherwise adapted for farming purposes, water is, to say the least of it, none too plentiful.

MINING OPERATIONS.

In the course of a month or two machinery should be arriving for the United Jack G.M. Co., one of the properties of the Murchison Range, and this should give a filip to the country generally, while the boundaries of the Gravelotte property, a mine said to be very rich in gold values, have quite recently been cleared which gives colour to the rumour that this mine, which has been closed for many years, will shortly be reopened. The "Blue Jacket," a property belonging to the H.E. Proprietary, and which was closed for a good number of years, has recently been taken up on tribute, and is doing fairly well now that the water pipe line from the Selati River has been overhauled and a plentiful supply of good water obtainable. This is the property which contained a drive called "The Jeweller's Shop," on account of the large quantity of visible gold it contained. The "La France," a property situate about fifteen miles from Ledysdorp, eastwards, is said to be a good one, and belongs to some East Rand people. This property had a good deal of work done on it some twelve or eighteen months ago, and it was confidently expected in this neighbourhood that it was to be floated into a company, but I presume the money market was at that time against the flotation, which has been postponed pro tem. Much rumour has been in Leydsdorp about the Sutherland Reef—I think the oldest mine in the district—being reopened. Should this be so, great good would result to Leydsdorp.

A PRODUCING PROPERTY.

All eyes are turned to the Griffin G.M. Co., a property in which Mr. D. M. Munro, of Zaaiplaats Tin, is greatly interested, in fact, he is the largest shareholder in the venture. This property, "the hope of the country-side," is now running ten stamps. For more than twelve months this mine obtained its water from a borehole, but the supply was quite inadequate for the demands, and only five stamps were able to be run, and those often only half or three-quarter time. Now, a pipe line has been laid from the property to the Selati River, a distance of about two miles, and since the middle of March ten stamps have been constantly running. Although this company does not have its results published separately in the monthly gold returns published in the newspapers, I hear on first-class authority that the mine is doing extremely well. Most of the gold in this mine is free milling. Quite recently it has been found that on this property the schist on each side of the "Griffin" Reef which is of a width of about five feet, each side of the reef carries good gold values, and this will make a workable width of about thirteen feet, as the "Griffin" Reef itself is rich, mostly carrying visible gold. The mine should prove one of the most valuable in the neighbourhood, and no doubt ere long will be adding to its number of stamps as the 4 inch pipe line from the Selati will be able to provide sufficient water for an additional 10 stamps.

BASE METALS.

Regarding the base metals, I understand a large number of mica claims at Malalane, a mile or so from the Oliphants River, and about twenty miles to the east where the railway crosses that river, have been taken up quite recently by a London company, and that work is shortly to commence on them. There is one mica property being worked, situate about thirty miles from Leydsdorp and five miles from the Oliphants River. Three white persons are engaged and a considerable number of natives, and, I am told, several tons of mica are now ready for shipment to Europe This shipment should go a long way to prove if the mica belt in that particular neighbourhood is payable or not. Certainly great things have been expected in this district from mica. This property is known as The Leydsdorp Mica, Ltd. The only other base metal being worked in the district is corundum. This is situate about a mile east of the railway line and about five miles on the Leydsdorp side of the Oliphants River. The concern has only been started a few weeks, and is being financed by some Johannesburg people. The corundum occurs in lenses and in reefs varying considerably in thickness, and although I am unable to give the percentage of the mineral to the ton of ore, I have every reason to believe it is a high one. Although the venture is of so recent a date, considerably over fifty tons of the ore have already been shipped to England, but I have no knowledge for what price it was sold. Great results are looked forward to concerning this proposition.

PHYSICAL CHARACTERISTICS.

Regarding the district geographically, etc., it is one of a flat nature, speaking generally, with the Murchison and Blue Jacket Ranges running for a considerable distance through it, with occasional kopjes appearing frequently on the surface. The timber is of the scrub character, except along the river banks, where one comes across some rather fine timber trees, which make up into really nice furniture. As to the climate, this in summer, say from September to the end of March, is very trying. Hot winds from the east are very prevalent, especially before the early rains, and while these are on one wants to do nothing except lie down in the coolest place one can find. The nights, too, during the summer are very warm and trying. Fever, although not nearly so bad as formerly, is still with us, but it is not the hot bed of fever one is led to believe, say, when talking to Pietersburg people, who have never been here. According to the yarns one is told up there one has only to show his face in the district and he is down with fever, and as to taking a dog down to the Low Country, well, this, if you believe them, is a waste of money and the dog's life. I myself have had two dogs, brought from the High Veld into the district, and although they have been here nearly two years, neither has been sick the whole of the time. Labour is plentiful in the district, and it only remains for the people with the needful to put a little cash into some of our promising good things to prove whether this district is the good one it is generally thought to be by the people living on the spot.—A correspondent in "The East Rand Express."

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Luminator Apparatus.

PURIFICATION TREATMENT OF WATER FOR STEAM BOILERS.

To the Editor, *South African Mining Journal.*

Sir,—I think I can answer some of the questions put by Mr. William Cullen in your last issue in regard to the working of the luminator apparatus. Mr. Cullen says: " Neither has my somewhat crude luminator lost weight after a year's continual work. The author of an article on this subject in the Journal of the Chemical, Metallurgical and Mining Society had to admit this, for he said that the loss was infinitesimal. The best results, according to the same author, are obtained when the luminator is facing either north or south, but an essential condition is that it be exposed to direct light. Now, why should running water over aluminium affect any change at all? Frankly, I do not know. So far as I can gather, no one as yet has succeeded in proving a chemical change. Then it must be physical, one would say, but here again nothing has been proved." Answer: On account of the catalytic force of aluminium, there is no loss of aluminium possible. On account of the chemical force of the ultra-violet sun's rays the carbonic acid CO_2 contained in all water is decomposed, and escapes. As the $Ca\,CO_3$ and $Mg\,CO_3$ are only soluble in water owing to the presence of carbonic acid, they are precipitated in the aluminium launder. The sunlight acts like the boiling. It is a well-known fact that a water rich in calcium carbonate or magnesium carbonate deposits a crust of them on boiling owing to the presence of the carbonic acid. The running of water over aluminium effects a rapid chemical change on account of a larger surface being exposed to the sun's rays. I patented in 1910 a new plant and automatic process for the extraction of gold from zinc, sulphate waste solution, copper sulphate, silver arsenic sulphide solutions. My plant is composed of tanks in which aluminium sheets are lowered. The process for working is as follows: (1) The plant must be exposed to sunlight. (2) The aluminium sheets placed at right angles to the needle of the compass. In my process I utilise also three natural forces: (1) The ultra-violet sun's rays or photolyse, which produce a very energetic oxidising action; (2) the catalytic force of aluminium; (3) the electrical force of the earth-current. Having written to Madame Curie, professor at the Faculté des Sciences de Paris, expert in radio-activity, to ask if the radio-activity played a part in my process, and if she considered my theory was plausible, I received the following reply: " 1st June, 1912. Your hypothesis seems to me correct. I think also that the aluminium must act as a reducing agent, and that the precipitation of gold and zinc is produced by the simultaneous action of the aluminium and the sun's rays. In regard to the action of the orientation of the plant, I cannot yet give you an explanation.—P. Curie." The complete probable theory of my process will be published in detail in later numbers of the *S.A. Mining Journal.*—Yours, etc.,

G. JACQUIER, B.Sc.

40 Portland House, 101 Commissioner Street.

Cape Alluvial Tin.

To the Editor, *South African Mining Journal.*

Sir,—In the report by Mr. F. Douglas Osborne, attached to the prospectus of the Alluvial Tin Fields of Africa, Ltd. —the company recently successfully floated in London, which took over the properties of the Kuils River Tin Mines, Ltd., in the Cape Province—allusion was made to the lodes in the vicinity, and a statement was made that all indications pointed to the existence of rich tin lodes in the vicinity. After stating that the country rock to a depth of 350 feet is so broken that there must be great difficulty in locating the lodes for so long as work is confined on the hills, Mr. Osborne went on to say that in the profitable working of the alluvial deposit the bedrock will be cleaned up at some 500 feet below the hill lode workings, and that this would mean a cheap entrance into the settled country and in all probability the satisfactory location of the main lodes; and he finished up with a statement that the potential value of a discovery of this description (i.e., in the settled country) it is not possible to estimate, and that to him this was a most attractive element. Although Mr. Osborne referred only in his report to the broken lodes that have been discovered on the Kuils River and the adjoining property of the Cape Bischoff, the idea has consequently got abroad that the whole country around Kuils River is broken. It is, therefore, to be regretted that Mr. Osborne did not inspect some of the work done by me on the Vlaggeberg, adjoining the property of the Alluvial Tin Fields to the south-east. On this hill two well-defined lodes of a stoping width, one containing wolfram and the other tin, in payable quantities, run parallel at a distance of some 150 feet. Both these lodes have the same strike (N. 23° W.) and the same dip (80° E. 23° N.). Some 150 feet lower than the second lode an adit was driven at right angles to the strike of these two lodes, and in this adit four veins were struck, striking and dipping exactly the same as the two lodes higher up the hill, thus showing that on the Vlaggeberg at least the country is certainly settled.—I am, etc.,

S. S. KEYZER.

68, St. Georges Street, Capetown,
1st June, 1912.

Sheba Railway: A Correction.

To the Editor, *South African Mining Journal.*

Sir,—I notice a paragraph in your current issue, in which it is stated that it is proposed to run a 3ft. 6in. gauge to the Sheba mine. This information is entirely erroneous, and I shall be glad if you will insert a contradiction in your next publication.—Yours, etc.,

H. B. WHITE,
General Manager, Sheba G.M. Co.

Eureka, Transvaal,
9th July, 1912.

Far Eastern Rand Geology.

To the Editor, *South African Mining Journal.*

Sir,—The views hitherto held and considered as proved beyond doubt regarding the geological age of the Van Ryn reef are being disputed and discussed just now with the result that some remarkable geological complications are involved. Attempts are being made, as already noted in the *South Africa Mining Journal* of the 8th inst., to form a syndicate with a capital of £40,000 to prove an alleged continuation across the Lower Witwatersrand beds through the farm Klipfontein No. 242 of the Van Ryn reef to the neighbourhood of the New Rietfontein mine. An enquiry into the feasibility of such a continuation ought not to be without interest to your readers. Mr. Olver, who can scarcely be regarded as an orthodox geologist, has carefully examined both the Van Ryn reef and the New Rietfontein reef and considers that there is a great similarity between the two and that they are probably both contemporaneous with the Main Reef Series. He does not, however, claim that the Main or Van Ryn reef wanders from its true geological horizon and cuts across the Lower Witwatersrand formation between the Van Ryn and New Rietfontein mines. Mr. Olver is of the opinion that the Van Ryn reef follows the exact course, prospecting operations have proved it to take from the Kleinfontein mine across Benoni, Apex, Rietfontein, Vogelfontein, on to Driefontein, leaving the farm Klipfontein No. 242 out in the cold and quite destitute of the Main or Van Ryn reef. The New Rietfontein reef Mr. Olver considers to probably belong to the Main Reef Series and to have been faulted into the position it now occupies, and claims to have found the reefs usually overlying the Main Reef Series which is a remarkably strong point in proof of his contentions. Although the New Rietfontein or Du Preez reef may have been regarded by orthodox geologists probably as of Elsburg age, there is a good deal to be said in favour of Mr. Olver's views, whilst the peculiar manner in which the Du Preez reef is faulted and isolated makes it exceedingly difficult to identify with certainty. Now Mr. Olver appears to agree with the views of the promoters of the Rietfontein—Van Ryn Extension Syndicate, Ltd., only so far that the Rietfontein—Du Preez reef is probably the same as the Van Ryn reef, but seems diametrically opposed to the views entertained by the promoters of the Syndicate to the effect that the Van Ryn reef occurs in the Lower Witwatersrand beds and is therefore not of Main Reef age. Evidently the promoters of the Rietfontein—Van Ryn Extension Syndicate are of the opinion that the Rietfontein and Van Ryn reefs are one and the same, and not only belong to the Lower Witwatersrand beds but are continuous between Rietfontein and Van Ryn. Such a view is not only opposed to that held by all orthodox geologists but distinctly opposed to what are genrally recognised as facts as firmly established by boring, shaft sinking, and mining operations so extensively conducted between Boksburg and Van Ryn. If, as urged by the supporters of the above syndicate, the Du Preez and Van Ryn reefs are continuous and constitute a reef series in the Lower Witwatersrand beds quite distinct from the Main Reef series, it may be advisable to examine the mining and geological facts bearing upon this question. About two years ago a remarkable map was published of a portion of the Southern Transvaal comprising the whole of the Witwatersrand gold fields and their extensions, purporting to show that the country due east and south-east of the town of Boksburg did not contain any portion of the Upper Witwatersrand beds carrying the productive gold reefs of the Rand. This map was apparently intended to show that the dolomites and coal measures rest directly in the hitherto considered barren Lower Witwatersrand beds. It is possible that the suggested continuity of the Van Ryn and Rietfontein reefs is based on this particular theory. It might perhaps seem fairly safe, seeing that the whole of this country is covered with these newer beds, to make such a suggestion as actual occular demonstration in the field is not obtainable, but it must not be forgotten that the whole of this disputed area has been penetrated by mine shafts and many hundred boreholes. In no single instance has it been shown that the beds overlying the Van Ryn reef belong to the lower division of the Witwatersrand goldfield; fine grained quartzites or slates may have been found, but this occurrence is neutralized in value by the discovery in every instance in their proper geological horizon of the whole of the reefs and other markers known to overlie the Main Reef series. If this important tract of country had never been proved, there might be some justification for launching such a theory, or had the Main Reef series stopped short at Boksburg and proved to take a right angle turn to the south as suggested. As a matter of fact, it has been proved to take no such course, but almost foot by foot has been shown by borehole and shafts to swing round to the north, and emerge from under the coal measures and outcrop on Benoni, Kleinfontein and at the Van Ryn mine. Further, if this far eastern section of the Witwatersrand was, as suggested, solely occupied by the Lower Witwatersrand beds, not only would the Main Reef series be absent but all the other overlying reefs as well. That such a suggestion as that offered in support of the Van Ryn reef being identical with the Du Preez reef, and involving the absence of the overlying reefs, is a mistaken one is shown by the fact that actual mining and boring operations have proved the Kimberley, Bird and Livingstone series to occupy their proper geological horizon throughout the whole of the Far Eastern goldfield. The Kimberley series has been proved to run all the way from its undeniable outcrop at the Cinderella Deep, through the Apex, Benoni, Modderfontein, Geduld, Grootvlei and Daggafontein farms, and under it the other characteristic reefs, so how can it be urged, then, that the Upper Witwatersrand beds are absent when every characteristic bed and reef of that division are proved to be present? It is certainly far too late to come forward now with such a suggestion. Twenty-five years ago, when so little was known about the actual geology of the Far Eastern Rand, such an idea might have received some credence, but it seems scarcely creditable to any one's intelligence after twenty years of active prospecting and the sub-outcrop of the Main Reef series established along with those of the overlying reefs to come forward to-day and ask any one to believe that these reefs, as certainly proved, do not exist. Taken on the whole, the Far Eastern goldfield is a true replica of the Upper Witwatersrand beds of the Rand—not so well developed perhaps from a geological standpoint—but from a mining view it must be regarded as a valuable section of the Rand and quite undeserving of the reproach now attempted to be placed upon it. That it will give a good account of itself in the future, regard need only to be paid to Brakpan, Modderfontein, Geduld, Van Ryn and Kleinfontein, developed and producing properties, and there are not wanting signs that some of the undeveloped properties may give an equally good account of themselves. From the foregoing statements it may be taken as proved that the productive Upper Witwatersrand division does undoubtedly exist on the Far Eastern Rand beyond Boksburg, and no tangible fact has been advanced to prove that the Van Ryn reef does not belong to the Main Reef series. Mr. Scott Alexander has, however, argued for years that the Van Ryn reef is distinct from the Main Reef series, but at no time has he expressed the view that the Van Ryn and the Du Preez are identical or continuous. Such a view would involve the Van Ryn reef leaving its present geological horizon and identifying itself with the Lower Witwatersrand unproductive division, a suggestion, however difficult to credit, is easier with an isolated faulted outlier such as that occupied by the New Rietfontein mine. Dr. Mellor has shown that the New Rietfontein reefs and accompanying quartzites rest on granite, and boreholes by the New Rietfontein Company have also proved this to be correct. Moreover, the New Rietfontein Company has discovered that to the south as well as to the east, the Du Preez reef is broken off entirely; and under these circumstances, how can it be continuous with the Van Ryn or any other reef? Some time ago the Du Preez Consolidated and others put down boreholes to the east of the New Rietfontein mine, but it was never proved that they had discovered the easterly continuation of the Du Preez reef, and if this and other boreholes cannot find it, it is scarcely logical to argue that it is continuous with any easterly extension when all available evidence goes to show that in that direction the reef is probably lost for ever. Dr. Mellor has of late given some close attention to the Lower Witwatersrand beds to the west of the Rietfontein mine, and has shown that although the Du Preez reef disappears, the Government series is well defined, and far more constant and continuous than geologists formerly regarded it to be. He has also shown that in the Lower Witwatersrand beds there are other reefs, but nowhere between the New Riefontein mine and Witpoortje does he seem to have recognised the Van Ryn reef which he undoubtely would have discovered had it existed. If the Van Ryn reef is identical with the Du Preez in the east, and can be seen outcropping, it will also exist about the same horizon in the west of the New Rietfontein mine, for Dr. Mellor has been able to trace and follow in detail all the recognised markers of the Lower Witwatersrand beds and would scarcely have missed, in making a detailed geological survey, such a conspicuous object as the Van Ryn reef. Is it not possible that the technical advisers of this syndicate have become mixed in their identification, and confused the reefs with some of those Dr. Mellor has shown to traverse the Lower Witwatersrand beds? To prove that the Van Ryn is identical and continuous with the Du Preez reef, one would have thought that work would have started and followed the reef in a westerly direction from the Van Ryn outcrop itself, and not midway between the two points sought to be connected up where geological correlation is doubtful, as seems to have been done by prospecting in Klipfontein, midway between Van Ryn and Rietfontein mines. The mere picking up a reef here will prove nothing, except confirm the work of Dr. Mellor, who has shown that there are continuous reefs in the Lower Witwatersrand beds as well as in the Upper Witwatersrand beds. To start with, having proved a huge hiatus at the Rietfontein mine end of the field, and to avoid starting at the Van Ryn end does not seem an ideal method of prospecting with the object of showing that the Van Ryn reef and that worked at New Rietfontein are one and the same reef and continuous. The only way to prove the reef extension is to commence at Benoni, and trace the outcrop by boring and shafts in the same manner as others have done during the last twenty years between Van Ryn and Boksburg. All well-wishers of the Rand will hope that if the attempt is made to show that the Van Ryn reef is continuous with Du Preez, extending and forming another line of reefs throughout the whole length of the Rand, every success will attend the efforts, but to have confidence in the venture, they naturally desire to see the work carried out in a scientific and workmanlike manner. In a recent issue of the *South African Mining Journal*, page 576, it was stated that a good deal of money was being spent on the East Rand to support the convictions of those who dispute the accuracy of the mapping of Dr. Hatch. Now, it may be pointed out that whilst geologists can scarcely be all expected to see eye to eye at all times with Dr. Hatch and his geological conclusions, there are few who will be able to find fault with his work on the Far East Rand. Twenty years ago, Dr. Hatch commenced studying the geology of the Far East Rand, especially in connection with the productive or Upper Witwatersrand division, and few geologists have enjoyed the same facilities for arriving at correct conclusions or had equal experience in this particular field. Twenty years ago, Dr. Hatch was consulting engineer for the Van Ryn mine, when all the Far East Rand, save within a radius of a mile of Van Ryn mine, was an unproved goldfield. In the work of proving that goldfield, Dr. Hatch has played a conspicuous part, and no one has done more to build up its geology and establish it on sound scientific lines. It was Dr. Hatch who, starting twelve miles east of Springs, proved the sub-outcrop of the Main Reef series, when the Oceana Consolidated and several others were looking for its extension to the east and north, thirty miles or more away. Its northern sub-outcrop was also proved under the guidance of Dr. Hatch, who, having established its northerly and easterly limits then proceeded by boreholes and traced its existence up to the points other companies travelling east had proved the reef to exist. Not only so, but Dr. Hatch proved the existence of the characteristic reefs or markers overlying the Main Reef series, and established beyond any possible dispute the identity of the Van Ryn with the Main Reef series. It comes rather late in the day and requires some self assertion to even dispute what by good, sound work has been proved to be the geological age of the Van Ryn series, let alone to dispute the existence of the Main Reef series in such a simple geological region as that of the Far East Rand. The Van Ryn itself, its proved continuation by its more or less sub-outcrop all the way to Boksburg, and its linking up with the outcrop of the East Rand Proprietary Mines, not to mention the wholesale manner in which the Kimberley, Bird and Livingstone reefs have been proved in the Far East Rand goldfield by actual mining operations, are in themselves such undeniable proofs of their existence that any one with an adequate knowledge of Rand geology would not feel justified in attempting to dispute it.—Yours, etc.,

G. R.

Stope Timbering.

To the Editor, *South African Mining Journal.*

Sir,—The writer of the article on stope timbering states that he considers the old Cornish saying, "Let the stick well fill the hitch," upholds his arguments, and what he advocated in his article, yet he distinctly states he cuts the hitch to fit the stick. How does he do it? The end of a stick is generally of a most irregular shape. He cannot cut the stick before the hitch is cut, because he cannot get the length before the hitch is cut. He cannot obtain the exact shape of the end section until that section is resting on the footwall, and it cannot rest on the footwall until it is inside the hitch. If by a miracle he cut a hitch the exact shape of a stick, the stick would not fill the hitch; it would simply cover the bottom of the hitch, which is quite a different thing. To bevel a stick and place it in a bevelled hitch is the practical way. There is no loss of strength, as the bevelled sides of the stick rest on the bevelled sides of the hitch, which tends to keep the stick together when it is inclined to split, in addition to keeping the stick in its place. His statement that the wedges in the footwall will not rot quicker than the foot of the stick is only right when the wedges are made of wood as durable as the stick. As the vast majority of wedges on the Rand are made of soft wood, and the very few hard wood wedges made are certainly not made of wood as durable as the usual colonial timber used as sticks. I still maintain it is bad practice to place wedges under the foot of a stick. In my criticism of his article, I asked if he would be surprised to hear that there are several ways of putting in a stick which are all right under certain conditions. Now, the funny part of it is that *under certain well-known conditions* you cannot do better than stand a stick on its toe (exactly as shown in your author's diagram) and jamb any kind of wedges—preferably soft wood ones—under it. The conditions which make this method "preferable" seldom or never occur on the Rand and to state that this is *the* method of putting in a stick shows want of experience. If he did not obtain the term "underlie" from the classroom, that is where it undoubtedly originated. No practical man would use such a term, because the term is impracticable. You could not tell a man to put in sticks at a certain angle of underlie in any ordinary stope. Take 50 sticks in any stope, and though they may all be put in right, their angle of underlie would differ greatly indeed, owing to irregularities of hanging and of the sticks themselves. No two men would agree as to what the angle of underlie of any particular stick was. What a practical man tells a timberman is about how many inches he wants the head of the stick to be placed above the position (which it would be in if placed) at right angles to the dip. An inch or two makes no difference if the object is kept in view, i.e., that the stick shall tighten its hold when the hanging makes the slightest movement in the direction of the dip.—Yours, etc.,

A. WILKS.

Mr. Olver's Views.

To the Editor, *South African Mining Journal.*

Sir,—I see, according to Mr. Olver, in his lengthy "Criticism of Dr. Mellor's Views," in your *Journal* of the 6th ult., he agrees with Drs. Hatch and Corstorphine, that the quartites on which the Geldenhuis Mill stands are the Hospital Hill quartzites. Dr. Mellor recognises them as Government Reef quartzites. What they really belong to, reef shales and all, is the Blue Sky series, which, in the tightest stratigraphy, to wit, the centre of Johannesburg, is over a mile away from the Hospital Hill quartzites, and the Government Reef series, of course, is no distant neighbour of the latter, except at Witpoortje, on the West Rand, where a good mile divides them. Where the fanning out of country has taken place, distances count for nothing, and can be absolutely disregarded, but the stratigraphical sequence remains the same, viz., Blue Sky, Van Ryn, Du Preez, Government Reef series, and so on up to the Hospital Hill quartzites, etc. Looking from the Geldenhuis Mill across the valley, one looks in vain for any of these series, as they have gone under, dropped into the earth's crust, as a matter of fact, and become covered with molten diabase, nature's cement, which she invariably uses to fill in little gaping gaps, such as Bezuidenhout Valley, to prevent her chosen microbes from breaking their necks trying to negotiate. I forget, for the moment, but I rather think that a few miles of Hospital Hill shales, from off the end of the range leading round to Sir George Farrar's farm, slipped in on their own account also—but what matters? The squeezing, elimination, extensions are in evidence and in perfect sequence in the hill to the east and west of the mill, squeezed to a certain extent, it is true, but what would not become squeezed in the embrace of those horrid, "stale," intrusive granites, which have a knack of wedging themselves in where they have no right, according to most geologists, who want things their way? The bit of badly broken Du Preez series, with its shales top and bottom, which broke loose from the Geldenhuis-Knights ridge during the upheaval, very nearly slipped into the molten mass when it slithered a mile or so north: but it is still there on the brink of the cooled cauldron to tell the tale of what kind of earthquakes they must have had in those days, and how they effected all series interlarded with slippery beds of shale—nature's lubricants.

Fortunately, the Main Reef proper, with its accessories, was embedded in hard, hard rocks, and defied the shocks and knocks of the volcanic waves which have forced up and fanned out, where they could, all the slippery customers from beneath. To illustrate what I mean by the missing Bezuidenhout Valley beds having fallen into the molten mass, after seeing the light of day for a few moments perhaps, imagine you are standing on the edge of Langermann's Kop, overlooking the Park—with a large P—face north, stretch out the right hand horizontally to the east, let the fingers represent the various series from Main Reef to Orange Grove quartzites, drop the middle finger, curl it under as far as you can without moving the others, and there you have it! The beds are not lost, but gone under, to be discovered some day by some enterprising individual who does not funk drilling into diabase in search of hidden treasures.

Whilst criticising Dr. Mellor's many faults and dykes in the pages of your *Journal*, I notice that Mr. Olver, like all the members of the Geological Society, believes in the "Witpoortje break." and in another important article of faith, viz., that by some miracle Main Reef series extension was taken out of the hands of nature at the Saxon and thrown holus bolus up on to Grey's Mijnpacht—the Mecca of the modern geologist, and the despair of the antiquated prospector. So that what with the agreements and the disagreements of these gentlemen, their controversy is likely to end in a draw, and the public will probably not gain much enlightenment regarding the *locale* of the economic series of the Rand, which, after all, to the layman, is the most interesting part of the discussion. In my opinion, geologists should first thoroughly study the stratigraphy of the Rand. Let them worry about the faults and dykes afterwards. But apparently the majority favour the reverse. Unfortunately there are no fossils to speak of in South African stratigraphy, as in Europe, to guide the learner (as they are all learners who come to this country). The student, if he is not keenly observant, or happens to be slightly colour blind, as many men are, without knowing it, will break his little heart at first, trying to get the 26,000 feet sequence of the Rand's geological age off by heart, to say nothing of the other four ages of equal thickness, all of which—with the exception of our coal measure age—are smashed, broken, scattered in all directions, for these must also be studied to make one comprehensive whole, so that he may "read as he runs." Unfortunately we have no really reliable geological books or maps to help the student: the country is too young, and what there are, perhaps he would be better without, as it is always more satisfactory to ferret things out quietly in consultation with nature's books than follow other men's ideas who may be utterly wrong. The proper way to begin is with the schistose age of Barberton or the Low Country which is world-wide—then the Lydenburg age; and, lastly, our coal measure age, or carboniferous—"nature's icing on the cake," which has not been disturbed by those fearful earthquakes, which played such havoc with all the rest. Granites and matters of that sort—Nature's filling—which we stumble across daily, and belong to no particular age, being ubiquitous, can be studied at leisure.—I am, etc.,

SCOTT ALEXANDER,
"Rand Stratigraphist."

Johannesburg, July 10th, 1912.

The Scientific Feeding of Mine Boys.

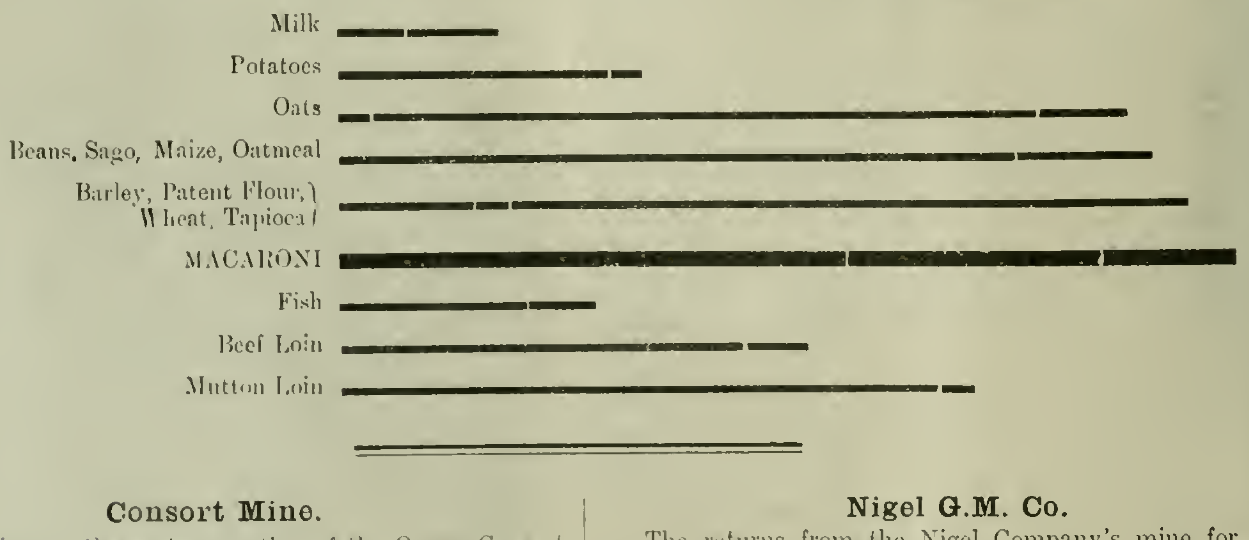
To the Editor, *South African Mining Journal.*

Sir,—"The Scientific Feeding of Mine Boys," as dealt with in a very interesting article in your issue of 25th May, has found a very good support and corroboration in the letter, signed "Engineer," of 1st June, and I wish to convey him my congratulations. The writer of "Scientific Feeding of Mine Boys" (25th May) points out the great nourishing value of a concentrated food of genuine wheat produce, this being indeed the most valuable foodstuff. "Engineer" has emphatically endorsed it, that a genuine wheat product as Spratt's biscuits meant for natives, is far better than certain bread of about 30 per cent. of water content. Wheat and genuine products of wheaten flour, as I am going to show it by the following comparative graphic table, are indeed the most nourishing, the most flesh, bone, and muscle-building material in the line of cereals and leguminosi. My friend "Engineer" will meanwhile have heard of the endeavours of the S.A. Macaroni Factory (the first gold medal prize in this line in S.A.) to introduce their product as another and very important foodstuff in the diet of natives in mine compounds. And "Engineer" will agree with me that macaroni being the richest of cereal foodstuffs, the most digestible, and therefore the most nourishing, combined with butterine and peaflour, as a morning or evening soup for the natives, will succeed in becoming the standard food in all native compounds. As a matter of fact already a good number of leading mining companies have introduced the products of L. Fatti & Co., S.A. Macaroni Factory, in their compounds and native hospitals. The cost of an abundant ration of such an excellent macaroni peaflour soup varys from only ½d. to maximum ¾d. The following graphical table of comparative nourishing values of the most prominent articles comprised in the Native Food Regulation will perhaps give my friend "Engineer" occasion to communicate with his most respectfully,

HELVETICUS.

Box 3314, Johannesburg,
10th July, 1912.

Graphic demonstration showing the contents of the nourishing proteids and carbo hydrates, plus fat, in the foodstuffs and foodstuff groups (taken from "Chemie der Menschlichen Nahrungsmittel," by Dr. J. Koenig, vol. II., 4th edition):—



Consort Mine.

Prospecting on the eastern portion of the Queen Consort has resulted in the discovery of a new reef of high value. In two places small shafts have been sunk on this reef. The value in both places is stated to be high.

Glynn's Lydenburg.

The following are the details of the output for June at Glynn's Lydenburg: Tons crushed, 3,201; yielding 1,718 ozs. fine gold, valued at £7,191. Estimated profit for the month, £3,202.

Nigel G.M. Co.

The returns from the Nigel Company's mine for June are as follows: Gold, 4,621 fine ozs.; profit, £4,702; stamps working, 75; value of gold, £19,629; tons milled, 13,000.

Sheba and Rosetta.

The following are the details of the output for June at the Sheba and Rosetta:—Sheba: Mill ran 28 days; crushed, 6,550 tons, yielding 2,987 ozs. fine gold. Estimated profit for month, £3,877. Rosetta: Crushed, 259 tons, yielding 119 ozs. fine gold.

Rhodesian Section.

LATEST FROM THE MINING DISTRICTS.

Lonely Reef G.M. Co.

The following extract is made from a cable despatched to the London office of the Lonely Reef Gold Mining Co. on June 19th:—No. 8 level continues to open up splendidly. North drive 85 to 105 feet, average width of reef is 42·25 inches, assaying 3 ozs. 14 dwts. At 105 feet the reef is 47 inches wide, assaying 4 ozs. 10 grains. South drive 65 to 85 feet, average width of reef is 66 inches, assaying 2 ozs. 2 dwts. At 85 feet the reef is 86 inches wide, assaying 1 oz. 15 dwts., not all exposed. No. 7 level south drive is improving in face. At 705 feet the reef is 18 inches wide, assaying 1 oz. 2 dwts. 12 grains. Consider this very important development, being furthest point in the mine south of shaft at which pay ore has been found, indicating new extension of the shoot. Main shaft 94 feet below No. 8 level at June 18th. Extract from cable despatched to London office on June 26th:—No. 7 level south drive 700 to 715 feet, average width of reef is 15 inches, assaying 1 oz. 15 dwts. 16 grains. No. 8 level north drive 105 to 115 feet, average width of reef is 42 inches, assaying 3 ozs. 17 dwts. Reef in face June 25th shows slight pinching in floor, probably only local. No. 8 level south drive 85 to 100 feet, average width of reef is 78·6 inches, assaying 4 ozs. 8¾ dwts.

Lubumbashi Smelters.

It is rumoured that Mr. Alan Gibb, consulting engineer, and Mr. Halewyck, general manager, will not return to the Lubumbashi smelting works, but that the late manager, Mr. P. K. Horner, will return in August, bringing with him another expert from the United States.

Bwana M'Kubwa Copper.

A new American manager has arrived at the Bwana M'Kubwa copper mine, and has started in to shake up things and to weed out the staff. It is believed that some construction work will soon be commenced, though if it be true that concentrates are to be shipped to Europe, no smelting works of any consequence will be required.

Eiffel Flats.

The main shaft in the Motor mine has now reached a depth of 610 feet. The sixth level crosscut will be put in at 650 feet.

Bechuanaland Copper Company.

Cable: Bushman mine.—Footage sunk and driven for April, 309; total, 7,408 feet. No. 5 shaft, 200 feet level. V. Lens assays 10 per cent. over a width of 36 inches and a length of 60 feet; the faces continue satisfactory. Preliminary treatment tests of the ore having given satisfactory results, a shipment of 30 tons of bagged ore of an assay value of 30 per cent. is being despatched to London for testing on a commercial scale.

Eileen Alannah.

From 1,305 feet to 1,320 feet the values of the Eileen Alannah, taken every 5 feet, vary from 11 to 12·4 dwts. over widths going from 59 to 77 inches. At 1,325 feet, however, the value rose to 1 oz. 5 dwts. over 65 inches.

Cam and Motor.

The present width of the reef in the last crosscut in the Cam and Motor mine off the south drive at 255 feet south is 44 feet value 11 dwts. and on the east crosscut 15 feet value 1 oz. 1 dwt.

Giant Mines.

The following is a copy of the cable recently despatched to London to Mr. Gordon Dickson, which caused a jump in Giants: "Mineralised matter has been met with in the 7th borehole exactly similar to that which has been met with in the 3rd borehole and at the same depth and parallel with the line of strike of the lode, thereby proving a length of 170 feet. Now sinking 8th borehole from same chamber as 5th borehole, on which met with acid dyke rock, the same as the acid dyke known down to the No. 6 level. Prospects now more hopeful than at any previous period, having definite information to work upon."

Rezende Mines.

Mr. S. R. Jameson, general manager of the Rezende, is now in England, and at the annual meeting of the company in mail week assured shareholders that they might, now that they had absorbed the Penhalonga mine, look forward to a prosperous year and steady profits. With the Penhalonga plant and the auxiliary plant now in course of erection it is hoped to deliver at the mine something like 1,000 h.p. The Penhalonga ore reserves amount to 120,220 tons, and these it is proposed to exhaust so long as the work can be done profitably.

Rhodesia Chamber of Mines.

In their report for the month of May the Executive Committee of the Rhodesia Chamber of Mines state:—The following is a summary of the returns of native labourers employed on Southern Rhodesian mines at the end of the month of March. The returns for April have not yet been received. The attention of the Government has been drawn to the late date of the publication of the labour returns. The figures for February are given for comparison:—

	MARCH.	FEBRUARY.
Local	13,426	12,115
Portuguese Territory	7,074	7,062
North-Western Rhodesia ...	4,167	4,165
North-Eastern Rhodesia ...	5,279	5,356
Nyasaland	4,676	4,550
Other sources	994	989
	35,616	34,237

The number of natives employed in March shows a decrease of 2,609 when compared with the corresponding month of 1911. The distribution was as follows:—

	MARCH.	FEBRUARY.
Producing gold mines ...	21,551	20,448
Non-producing gold mines..	12,908	12,596
Coal and other mines ...	1,157	1,193
	35,616	34,237

The consideration of the Native Pass Consolidation Ordinance, draft of which was introduced at short notice, was postponed by the Legislative Council in order to allow time for its further consideration by public bodies and others interested. The Committee are now examining the Ordinance and preparing detailed suggestions for its amendment. Amongst other matters which have received the attention of the Committee during the month are: Rail rates on meal; native labour; revision of the Mining Law, etc.

THE PICKSTONE MINE FLOTATION.

Points from the Consulting Engineer's Report.

The prospectus of the Pickstone Gold Mine, Ltd., appeared in our last issue. The capital of the company is £50,000, divided into 50,000 shares of £1 each, of which 24,000 fully paid shares will be allotted to the vendors in payment of the purchase price and 12,000 shares are offered for subscription at par, of which 2,500 are offered for subscription in Southern Rhodesia. Fourteen thousand shares will be held in reserve. The first directors are Messrs. William McDonald Stokes, Alfred Ernest Ward, and Baillie Munro Stokes; two others will be appointed, who will join the board after allotment. The secretary and registered offices (pro. tem.) of the company are the Salisbury Board of Executors, Ltd. The company has been formed to acquire from the S.L. Syndicate, five blocks of claims in the Hartley district, known as the Pickstone No. 1 West, Pickstone, Pickstone No. 1 East, Pickstone No. 2 East, Pickstone N. D.B., together with an option to acquire two further blocks known as the Duchess and Duchess No. 4, for the sum of £700 cash. The purchase price of the Pickstone blocks, together with all the plant and machinery thereon at February 28th, 1912, has been fixed by the vendors, the S.L. Syndicate, at £21,000, payable in shares.

Consulting Engineer's Report.

The report of the consulting engineer to the company, Mr. R. W. Pringle, A.R.S.M., of Gatooma, states that the five Pickstone blocks cover a length on the strike of two deposits of nearly 6,000 feet; the property is situated 17 miles by road from Hartley. Two distinct classes of gold-bearing mineral are worked, that in the Pickstone West Mine consisting of nearly pure hematite carrying gold values and containing some quartz, while in the Pickstone and Pickstone 1 E., the ore is in the form of gold-bearing quartz veins. The total tonnage available in the Pickstone W. for immediate etxraction is estimated at 15,000 tons of an average value of 8.32, and there is a further reserve of 51,949 tons of low-grade ore, which, however, it is not proposed to work at present. From the Pickstone Mine gold to the value of £26,715 10s. 7d. has been won from 2,300 tons of rubble and quartz during the period November, 1907, to September, 1911. Up to July, 1911, the plant of the Pickstone Mine consisted of one Tremain mill only. From the Pickstone No. 1 East Extension, 2,657.49 ozs. fine gold, value £11,175 14s. 1d., have been won from 2,074 tons of ore during the five months January to May, 1912. The developments on this principal vein now show a strike of 1,200 feet, and the final limits are not yet demonstrated. It is proposed to erect gravity stamps and Chilian mills capable of treating approximately 100 tons per day or more, and the plant is estimated to cost about £9,000. Mr. Pringle estimates that a deposit of the magnitude of the hematite body in the Pickstone West can be mined and treated for 10s. 6d. per ton, and with the costs at that figure and allow 0.5 dwt per ton loss in treatment, the profits to be expected from the ore already developed in that section of the property are estimated at £48,615. No estimate of the amount of ore reserves or of the profits to be realised have been attempted in tho case of the quartz veins in the Pickstone and Pickstone No. 1 East, but the prospectus points out that the record of the past five months indicates the class of ore being developed and the consequent possibilities.

In conclusion, the prospectus states that the estimated profits are already sufficient to redeem the whole of the proposed capital, leaving profits from future developments as a net gain, and in addition, there is a likelihood of the hematite body continuing eastwards into the other three Pickstone blocks on a line parallel to the system of quartz veins, but 200 to 300 feet to the south of them and taking everything into consideration, the property becomes more valuable the more it is opened up, and a brilliant future appears to be assured. The only contracts entered into by the company are an agreement dated June 18, 1912, between William McDonald Stokes, Bailie Munro Stokes, Harry Stokes, and Alfred Ernest Ward, carrying on business together as the S.L. Syndicate of the one part, and James Edward Nicholls, as agent of the Pickstone Gold Mines, Ltd., of the other part, being the agreement of sale from the vendors to the company of the blocks of claims referred to in the prospectus, and two other contracts for supplies of native food and explosives to be taken over by the company from the vendors. The qualification for every director is the holding of shares to the nominal value of £100. Applicatioos for shares may be made to any branch of the Standard Bank of South Africa, Ltd., from whom copies of the prospectus and forms of application can be obtained. The vendors undertake to purchase at par all the unsubscribed shares of the present issue, and also for a period of six months from the date of registration of the company, they agree to withhold from the market at least 75 per cent. of their vendor share holding.

Rhodesian Mining.

Mr. F. W. Denbigh, a well-known mining man, contributes to *Rhodesian Opinion* of last Friday an interesting article on gold mining in that territory, which well repays reading. He regards the country as the prospector's paradise—a splendid country for small propositons; " but," he asks, " what is the good of it if one cannot get any capital to help one "; and the remedy he proposes is a very simple one. He suggests that the Chartered Company should put a good round sum in the estimates, and allocate a specific amount to each mining district, to be dealt with by a board to be elected in each district by prospectors and small workers. This plan, he tells us, is adopted in New South Wales and Western Australia, and works well. He also advocates the establishment of public batteries, and sets forth in detail how such mills are provided and worked in Western Australia. The crushings, he says, are arranged by ballot, and the cost runs to about 10s. per ton. He has a good word for the B.S.A. Company's Development Company, and, as regards assays, he thinks the Chartered Company should do them for bona-fide prospectors free of charge.

Gaika G.M. Co.

The following particulars are taken from the Gaika report for the quarter ended March 31st, recently issued: Development during the period was confined to the north section. Five stamps ran 79·68 days and the Chilian mill 77·44 days; tons milled, 8,962, giving a duty per day of 112·4 tons; yield from mill, 3,249 ozs.; yield per ton milled, 7·25 dwts.; tons cyanided, 4,269; yield, 440 ozs.; yield per ton milled, 0·98 dwt.; working expenses, total, £9,738; total value of bullion recovered, £15,509; estimated working profit, £5,771; sundry revenue, £36; capital expenditure, £6,898.

Exploring Land and Minerals.

The report of the Exploring Land and Minerals Company for 1911 states that since December 31 last 101,000 shares have been issued at a premium. Of the total capital of £375,000, divided into shares of 5s. each, 412,061 shares are now held in reserve. The liquid assets at June 7, 1912, are stated to have amounted to £81,504. During the period under review the Lesapi Flat Farm of about 3,290 acres was sold at a good profit, and since December 31 the M'bobo Flat and Marngu Farms of about 8,900 acres have also been disposed of. Land in Rhodesia has advanced in value since the date of the last report, and the price obtained for the farms sold was considerably in excess of what could have been realised during the previous year. It is the intention of the board to form a ranching company, and to transfer a large area of land thereto.

Amalgamated Properties of Rhodesia.

According to a Reuter cable, it is reported that the following are the terms of the agreement between Sir Abe Bailey and the Amalgamated Properties of Rhodesia. Sir Abe Bailey to take back all the properties he sold to the Amalgamated and 400,000 Rhodesia Copper shares, and also loan the Amalgamated Properties £100,000 for a term at 5 per cent., in return for which he shall have a call on the unissued capital.

Development on Mr. Luxat's Orcus claims is being rapidly pushed ahead by Mr. Playfair for the Exploring Land and Minerals Company, Ltd., who have an option on the property. The main shaft is now well below 100 feet. We learn that the London and Rhodesian Mining and Land Company, Ltd., have given up their option on Mr. W. H. Fletcher's claims, the St. Aldwyn.

THE JUNE GOLD OUTPUT IN DETAIL.

Decrease Reflects Difference of a Day on Previous Month.

The gold output for the Transvaal was declared by the Chamber of Mines on Wednesday at 753,936 ozs. fine gold, of the value of £3,202,517, which is a decrease on the May production of 25,726 ozs., value £109,277. The decrease is about equivalent to the difference in the number of working days in the month. The Rand yield of 722,588 ozs., value £3,069,360, which shows a decrease of 24,360 ozs., value £103,473, reflects almost exactly a day's shortage in the production on the May basis of output, as also does the return of 31,348 ozs., value £133,157, from outside districts, the decrease being 1,366 ozs., value £5,804. It will be noticed that the Ferreira Company has disappeared from the list as a contributing unit, and the Midas Deep has also ceased to contribute. May put up a record in both average daily yield and profit, which June has almost equalled. The increase in the group profits, it will be seen, is due to the Robinson group coming into line and furnishing the salient features of its month's work for the benefit of its shareholders, as all the other groups have done for years past.

THE SALIENT FIGURES.

The following are the salient figures:—

Total output	753,936 ozs.
Value	£3,202,517
Decrease	25,726 ozs.
Value	£109,277
Rand output	722,588 ozs.
Value	£3,069,360
Decrease	24,360 ozs.
Value	£103,473
Outside districts	31,348 ozs.
Value	£133,157
Decrease	1,366 ozs.
Value	£5,804
Total stamps	10,093
Increase	20
Rand	9,515
Increase	35
Outside districts	578
Decrease	15
Tube mills	266

THE YIELD AND PROFIT ASPECT.

The yield and profit aspect for the past fifteen months for the Rand is as follows:—

	Days.	Daily yield.	Daily profit
1911—			
April	30	£90,395	£28,123
May	31	90,188	26,765
June	30	93,028	28,255
July	31	93,160	27,112
August	31	93,834	27,799
September	30	94,834	27,240
October	31	92,891	26,040
November	30	97,905	27,483
December	31	93,282	27,605
1912—			
January	31	97,188	26,182
February	29	98,868	28,032
March	31	100,011	35,167
April	30	100,071	29,932
May	31	102,350	30,961
June	30	102,312	33,829

LABOUR.

There is again a decrease of 4,254 for June according to the Witwatersrand Native Labour Association figures, compared with May, on the total employed on gold, coal and diamond mines. There is a decrease on gold mines of 5,335, and an increase in coal mines of 81, while diamond mines increased their complement by 992. The figures for the past three months of the number employed by members of the W.N.L.A. at the end of each month read:

	April.	*May.*	*June.*
Gold mines	197,937	193,829	188,494
Coal mines	8,364	8,460	8,549
Diamond mines	13,785	14,538	15,530
Totals	220,086	216,827	212,573

STAMPS.

The stamp position shows an increase on the Rand, and a decrease outside. The Rand increase is due to a few mines being able to put more stamps in commission, while the reductions are due mostly to insufficiency of labour. The details of changes are as follows:—Rand: Increases—Bantjes, 5; Brakpan Mines, 20; Ferreira Deep, 75· Jupiter, 5; Robinson Deep, 15; Roodepoort United, 5; Simmer Deep, 10; miscellaneous, 5; total, 140. Decreases—Consolidated Main Reef, 10; Ferreira, 80; Jumpers-cum-Treasury, 5; Knight Central, 5; Vogelstruis Estate, 5; total, 105; total increase, 35. Outside: Decrease: Miscellaneous, 15; total increase, 20. There were 259 tube mills operating on the Rand and 7 in outside districts.

THE FIRST DOZEN.

The order is changed by the Crown Mines ousting the East Rand Proprietary from first place. A further alteration is made by the entrance of the Ferreira Deep, enabling it through its absorption of the Ferreira to take fifth position. Brakpan Mines goes up from ninth in May to seventh for June, despite the Ferreira Deep coming in, and New Modder falls from sixth to ninth. Geldenhuis Deep falls from eighth in May to eleventh for June, and the Village Main disappears from among the first twelve, while the Robinson Deep retains the last place in the first dozen. The short month decrease is somewhat counterbalanced by the advent of the Ferreira Deep. The comparative aggregate figures show that 50 more stamps were operated and three more tube mills. The tonnage milled was 30,684 tons less and the value recovered £44,994 below that of May. The following are the details of production:—

	Stamps.	Tube Mills.	Tons Crushed.	Value.
Crown Mines	660	22	161,200	£255,161
East Rand Proprietary	820	25	152,850	249,881
Randfontein Central	700	29	198,547	249,478
Robinson	250	6	45,900	104,724
Ferreira Deep	235	7	52,660	104,305
Rose Deep	300	7	61,700	95,837
Brakpan Mines	150	6	55,123	89,584
Simmer and Jack	320	7	75,800	86,955
New Modderfontein	180	7	42,000	86,225
Nourse Mines	260	7	54,300	84,067
Geldenhuis Deep	300	7	52,400	83,447
Robinson Deep	245	6	52,400	80,023
Totals	4,420	136	1,005,880	£1,569,687

GROUP PROFITS.

The following are the profits returned for April, May and June by the mines controlled by the different groups:—

	April.	May.	June.
Rand Mines	£224,289	£238,284	£242,288
Rand Mines-Eckstein group	225,284	243,784	231,590
Gold Fields	113,026	117,305	113,230
East Rand Proprietary	114,608	114,541	92,256
Barnato	63,336	66,133	67,467
General Mining	60,494	67,968	63,403
Neumann	55,333	57,213	60,362
Cons. Mines Selection	30,949	40,317	40,804
Goerz	10,649	14,255	15,017
Anglo-French	—	—	23,038
Robinson Group	—	—	88,450
Totals	£897,968	£959,890	£1,014,867

Increases and Decreases.

The following returns of the June output have been filed with the Chamber of Mines. Increases and decreases compared with May are subjoined:—

The Witwatersrand.

	May.	June.	Inc.	Dec.
	£	£	£	£
Aurora West	17,165	17,649	484	—
Bantjes	36,497	34,215	—	2,282
Benoni	7,663	353	—	7,310
Brakpan Mines	88,442	89,584	1,142	—
City and Suburban	53,700	52,621	—	1,079
City Deep	75,915	75,168	—	747
Cinderella	29,649	25,444	—	4,205
Consolidated Langlaagte	30,469	30,150	—	319
Consolidated Main Reef	33,022	34,993	1,971	—
Crown Mines	262,726	255,161	—	7,565
Durban Roodepoort..	15,062	14,778	—	284
Durban Roodepoort Deep... ...	38,026	37,533	—	493
E.R.P.M.	275,295	249,881	—	25,414
Ferreira Deep	80,626	104,307	23,681	—
Geduld	19,302	18,626	—	676
Geldenhuis Deep	91,624	83,447	—	8,177
Ginsberg	21,808	21,566	—	242
Glencairn	16,626	16,456	—	170
Jupiter	44,495	41,471	—	3,024
Jumpers-cum Treasury..	16,664	14,158	—	1,506
Knight Central	29,989	27,521	—	2,468
Knights Deep...	51,368	50,187	—	1,181
Luipaardsvlei...	15,589	15,755	166	—
Lancaster West	25,707	24,492	—	1,215
Langlaagte Estate	63,508	61,694	—	1,814
Main Reef West...	31,845	32,355	510	—
May Consolidated	17,373	17,828	455	—
Modder B	59,485	60,067	582	—
Meyer and Charlton.	28,990	25,852	—	3,147
New Kleinfontein	63,045	72,216	9,171	—
New Primrose	35,995	35,711	—	284
New Modder	94,593	86,225	—	8,368
New Unified	17,021	17,161	140	—
Nourse Mines...	84,492	84,067	—	425
New Rietfontein...	20,835	20,045	—	790
New Goch	30,167	26,574	—	3,503
New Heriot	23,588	23,876	288	—
Princess..	24,539	24,514	—	25
Randfontein Central..	260,985	249,478	—	11,507
Robinson	104,549	104,724	175	—
Rose Deep	97,426	95,837	—	1,589
Robinson Deep	79,726	80,023	297	—
Roodepoort United Main Reef	33,430	30,660	—	2,770
Spes Bona	6,257	6,529	272	—
Simmer East	29,403	31,369	1,966	—
Simmer and Jack..	92,384	86,955	—	5,429
Simmer Deep...	44,397	44,015	—	382
Village Main Reef	81,505	79,012	—	2,493
Village Deep	71,362	69,998	—	1,364
Van Ryn	55,862	50,765	—	5,094
Vogelstruis Estates...	13,478	12,773	—	705
Witwatersrand	46,636	46,559	—	77
Wolhuter	41,636	40,299	—	1,346
West Rand Consolidated	37,703	35,970	—	1,733
Witwatersrand Deep.	53,959	52,859	—	1,100
West Rand Central...	3,865	3,581	—	284
Miscellaneous...	18,914	24,262	5,348	—
Outside Districts.				
Barrett...	1,138	714	—	424
Glynn's Lydenburg...	7,744	7,298	—	446
Nigel...	20,168	20,410	242	—
Sheba	12,679	15,959	3,280	—
Sheba Rosetta	731	1,253	522	—
Sub Nigel	8,984	8,096	—	888
Transvaal G.M. Estates	40,273	36,637	—	3,638
Worcester	5,666	5,539	—	127
Miscellaneous	41,578	37,251	—	4,327

Our Monthly Table.

The following is our usual monthly table:—

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	13,946	80	4,155	17,649
Bantjes Consolidated	24,000	85	8,055	34,215
Benoni Consolidated	—	—	83	353
Brakpan Mines	55,123	150	21,090	89,584
City Deep	40,200	110	17,696	75,168
City and Suburban	27,449	140	12,388	52,621
Cinderella Consolidated ...	17,902	80	5,990	25,444
Consolidated Langlaagte ...	19,290	140	7,098	30,150
Consolidated Main Reef ...	23,556	110	8,238	34,993
Crown Mines	161,200	660	60,070	255,161
Durban Roodepoort	13,707	90	3,479	14,778
Durban Roodepoort Deep ...	23,660	100	8,836	37,533
East Rand Proprietary ...	152,850	820	58,825	249,881
Ferreira Deep	52,660	235	24,556	104,307
Geldenhuis Deep	52,400	300	19,645	83,447
Ginsberg	14,501	80	5,077	21,566.
Glencairn Main Reef	19,458	160	3,874	16,456
Geduld Proprietary	14,320	50	4,385	18,626
Jupiter	43,200	120	9,763	41,471
Jumpers-cum-Treasury ...	7,730	75	3,333	14,158
Knights Deep	59,700	270	11,815	50,187
Knight Central	22,500	105	6,479	27,521
Lancaster	19,400	100	5,766	24,492
Langlaagte Estate	52,008	200	14,524	61,694
Luipaardsvlei Estate	16,200	60	3,709	15,755
Main Reef West	19,782	100	7,617	32,355
May Consolidated	14,930	100	4,197	17,828
Meyer and Charlton	13,896	75	6,056	25,852
Modderfontein B.	32,100	80	14,141	60,067
New Goch	26,066	120	6,256	26,574
New Heriot	12,200	70	5,621	23,876
New Kleinfontein	49,300	220	17,001	72,216
New Modderfontein	42,000	180	20,299	86,225
New Primrose	24,000	160	8,407	35,711
New Rietfontein	15,700	120	4,719	20,045
New Unified	11,150	60	4,040	17,161
Nourse Mines	54,300	260	19,791	84,067
Princess Estate	18,200	60	5,771	24,514
Robinson	45,900	250	24,654	104,724
Robinson Deep	52,400	245	18,839	80,023
Randfontein Central	198,547	700	58,732	249,478
Roodepoort United	33,726	60	7,218	30,660
Rose Deep	62,700	300	22,562	95,837
Simmer Deep	49,450	135	10,362	44,015
Simmer and Jack	75,800	320	20,471	86,955
Simmer East	35,500	130	7,385	31,369
Spes Bona Tribute	—	40	1,537	6,529
Van Ryn	37,760	125	11,951	50,765
Village Deep	48,800	180	16,479	69,998
Village Main Reef	39,660	220	18,601	79,012
Vogelstruis Estate	10,945	70	3,007	12,774
West Rand Central	2,371	20	843	3,581
West Rand Consolidated ...	26,600	100	8,468	35,970
Witwatersrand	39,600	220	10,961	46,559
Witwatersrand Deep	36,990	245	12,444	52,859
Wolhuter	29,400	120	9,485	40,290
Miscellaneous producers ...	—	—	4,712	24,262
Heidelberg—				
Nigel	13,000	75	4,805	20,410
Sub Nigel	4,300	30	1,906	8,096
Barberton—				
Barrett	—	—	—	714
Sheba-Rosetta	—	20	—	1,253
Sheba	6,550	70	770	3,271
Worcester Exploration ...	5,000	40	1,304	5,539
Lydenburg—				
Glynn's Lydenburg	3,201	20	1,718	7,298
Transvaal G.M. Estates ...	13,173	75	8,625	36,637
Klerksdorp—				
Miscellaneous producers ...	—	248	8,770	37,251

Rand Mines Group.

The following are the results of crushing operations of the subsidiary companies of the Rand Mines, Ltd., group for June:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	62,700	18/ 2	22,562	£37,681
Geldenhuis Deep .	300	7	52,400	26/ 2	19,645	13,510
Nourse Mines ...	260	7	54,300	20/11	19,791	25,842
Ferreira Deep ...	235	7	52,660	20/ 8	24,556	48,137
Crown Mines ...	660	26	161,200	17/ 9	60,070	108,868
Dur. Rood. Deep	100	3	23,660	24/ 4	8,836	8,250
Totals & averages	1855	57	406,920	20/ 1	155,460	£242,288

The declared estimated monthly profits for 1912 are:—January, £206,122; February, £209,989; March, £267,731*; April, £224,289; May, £238,284; June, £242,288.

*Including £50,129 special declaration of reserve gold.

The increased profit of the Ferreira Deep is due to the inclusion of the Ferreira Gold Mining Company, Ltd.'s, profit owing to amalgamation.

The following are the results of crushing operations of the Eckstein companies of the Rand Mines, Ltd., for June:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	32,100	17/ 9	14,141	£30,782
New Modder... ...	180	7	42,000	21/ 6	20,299	39,734
City Deep	110	9	40,200	23/10	17,696	26,024
Village Deep ...	180	6	48,800	19/10	16,479	20,611
Village Main ...	220	6	39,660	18/ 0	18,601	42,067
Robinson	250	6	45,900	15/10	24,654	66,848
Bantjes	85	3	24,000	23/ 5	8,055	5,524
Totals & averages	1105	42	272,660	19/10	119,925	£231,590

The decreased profit of £6,160 of the New Modderfontein was due to the lower tonnage crushed. The manager reports shortage of labour.

The declared estimated monthly profits for 1912 are:—January, £221,326; February, £213,242; March, £373,426;* April, £225,284; May, £243,784; June, £231,590.

*Including £151,119 special declaration of reserve gold.

Neumann Group.

The following are particulars of the results achieved by the crushing companies in this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep	36,990	£52,341	£17,207
Wolhuter	29,400	40,270	15,026
Consolidated Main Reef ...	23,556	35,079	11,557
Main Reef West	19,782	31,975	11,671
Knight Central	22,500	27,161	4,468
Jumpers-cum-Treasury ...	—	—	433
		Total for group	£60,362

The Wolhuter has 2,493·227 ozs. in reserve.

The monthly profits for 1912 are: January, £44,280; February, £46,072; March, £52,686; April, £55,333; May, £57,213; June, £60,362.

Barnato Group.

The following are the results of operations for June on the producing mines of the Barnato group:—

COMPANY.	STAMPS.	TONS.	REVENUE.	PROFIT.
Consolidated Langlaagte .	140	19,290	£30,149	£9,852
Ginsberg	80	14,280	21,564	7,058
Glencairn	160	19,458	16,457	2,948
New Primrose	160	24,000	35,712	18,368
New Rietfontein	120	15,700	20,047	3,407
New Unified	60	11,150	17,162	5,188
Quest	30	2,517	2,923	508
Witwatersrand	220	39,600	46,558	20,138
June totals	970	145,995	£190,572	£67,467
May totals	970	147,771	£192,526	£66,133

The monthly gross profits for 1912 are:—January, £59,227; February, £58,273; March, £61,223; April, £63,336; May, £66,133; June, £67,467.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of June of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit
Simmer and Jack ...	320	7	75,800	20,471	£46,165
Robinson Deep	245	6	52,400	18,291	33,460
Knights Deep	270	6	59,700	11,816	16,227
Simmer East	130	3	33,500	7,385	6,267
Simmer Deep	135	8	49,450	10,362	4,642
Jupiter	120	1	43,200	10,063	5,100
Sub Nigel	30	1	4,300	1,906	1,369
Totals	1250	38	318,350	80,294	£113,230

Reserve Gold.—Simmer and Jack, 1,455 ozs.; Robinson Deep, 3,362 ozs.; Jupiter, 250 ozs.; Sub Nigel, 500 ozs.; total, 5,567 ozs.

The "total profit" shown above includes sundry revenue, viz.: Simmer and Jack, £1,500; Robinson Deep, £561; Knights Deep, £326; Simmer East, £99; Simmer Deep, £338; Jupiter, £240; Sub Nigel, £389; total, £3,453.

At the Robinson Deep, in addition to the above, 549 ozs. of gold were obtained from the old mill plates, the proceeds of which, namely, £2,300 have been placed to the renewals fund.

The declared profits for 1912 are: January, £101,429; February, £111,697; March, £120,190; April, £113,026; May, £117,305; June, £113,230.

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For Pumping Sands and Slimes.

Minimum Maintenance Costs, Highest Efficiency,
Unrivalled Accessibility to all parts and Flexibility
in raising tailings to any height.

The Pump that Supplanted the Tailings Wheel.

Further particulars from the Licensees:—
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TARRY & COMPANY, LTD., Johannesburg.
ROWE & JEWELL, Johannesburg.
WRIGHT, BOAG & CO., Johannesburg.

Patented Transvaal., Gt. Britain, Australia, United States of America, &c.

The Albu Group.

The June operations of the producing mines of the Albu group are as follows:—

Company.	Stamps.	Tube Mills.	Tons Crushed.	Total Cost.
Aurora West	80	—	13,946	£13,617
Cinderella Consolidated ...	80	3	17,902	21,460
Meyer and Charlton	75	2	13,896	12,769
New Goch	120	4	26,066	21,790
Roodepoort United	60	4	33,726	27,318
Van Ryn	125	6	37,760	30,340
West Rand Consolidated ...	100	4	26,600	29,586
	640	23	169,896	£156,880

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	19/ 6·3	£17,653	£4,036
Cinderella Consolidated ...	23/11·7	25,518	4,058
Meyer and Charlton	18/ 4·5	29,557	16,788
New Goch	16/ 8·6	26,538	4,748
Roodepoort United	16/ 2·4	30,760	3,442
Van Ryn	16/ 0·8	54,325	23,985
West Rand Consolidated ...	22/ 2·9	35,932	6,346
		£220,283	£63,403

The monthly gross profits for 1912 are:—January, £62,797; February, £48,400; March, £61,777; April, £60,494; May, £67,968; June, £63,403.

At the Cinderella Consolidated the smaller tonnage and profit are due to the stoppage of the mill for two days for the purpose of installing man cages in the shaft.

At the New Goch the underground position is now practically normal, and an early improvement in tonnage and profits is fully anticipated.

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of June are:—

COMPANY.	STAMPS.	TUBES.	TONS.	VALUE.	PROFIT.
May Consolidated ...	100	—	14,930	£17,783	£6,132
Princess Estate ...	60	5	18,200	24,455	1,080
Lancaster West ...	100	3	19,400	24,433	3,393
Geduld	50	2	14,320	18,581	4,412
	310	10	66,850	£85,252	£15,017

The monthly profits for 1912 are: January, £11,860; February, £12,242; March, £11,231; April, £10,649; May, £14,255; June, £15,017.

Robinson Group.

The following are the results of the working of the mines of the Robinson group during June:—

	Tons.	*Ozs.*	*Profit.*	*Per ton.*
Langlaagte Estate ...	52,008	14,524	£15,200	5/10·00
Randfontein Central ...	198,547	58,732	73,250	7/ 4·56
Totals	230,555	83,256	£88,450	—

E. J. MOYNIHAN,

CONSULTING ENGINEER.

PLANS, SPECIFICATIONS, REPORTS AND ADVICE, MINING EQUIPMENT, STRUCTURAL WORK AND FINANCIAL ADVICE.

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MINING MEN AND MATTERS.

Mr. F. von Hessert has sailed for England.

* * * *

Mr. D. Q. Henriques has resigned the chairmanship of the Oceana Consolidated, but retains his seat on the board.

* * * *

The Hon. F. S. Malan, Minister of Mines, is visiting the Rand, and personally studying conditions on the mines.

* * * *

A concert will be held to-night in the Government Miners' Training School at the Wolhuter, in commemoration of "Foundation Day" of the institution, when, it is hoped, the Minister of Mines will be present.

* * * *

It is notified that the Minister of Mines has been pleased to appoint the undermentioned gentlemen to be additional members of the Miners' Phthisis Prevention Committee: Dr. Louis Godfrey Irvine, M.B., Dr. Wilfred Watkins-Pitchford, M.D., F.R.C.S., D.P.H.

* * * *

Mr. Robert Pill has been appointed Joint Technical Adviser to the General Mining and Finance Corporation, in which capacity he will supervise the operations of the mines of the group in the western portion of the Rand. The subsidiary companies of the group from the Meyer & Charlton eastwards will remain under the technical supervision of Mr. J. W. H. Stubbs.

* * * *

The monthly meeting of members of the Geological Society of South Africa will be held in the council chamber, Chamber of Mines, on Monday evening, the 15th of July, at 8.15 p.m. The following papers will be open for discussion: "Iridosmine from the New Rietfontein Mines: its Occurrence, Analysis, and Genesis," by C. Baring Horwood, B.Sc. (Lond.), A.R.S.M., A.M.I.C.E. "Topography and Geology of the German South Kalahari," by Dr. Paul Range. "Note on a Specimen containing Bastnasite and Wolframite from Welgevonden, No. 777," by D. P. McDonald, M.A., B.Sc. "Note on the Relationship between the Black Reef Series and the underlying Diabase," by C. Baring Horwood, B.Sc. (Lond.), A.R.S.M., A.M.I.C.E. The following papers will be read: "Notes on the Pebbles of the Rand Banket," by R. B. Young, M.A., D.Sc. (Edin.). "On the Occurrence of Dwyka Conglomerate in the Klip River Valley," by David Draper (hon. member). "Some Sections on the Farm Zuurbekom," by David Draper (hon. member).

Zaaiplaats Tin Mining Co.

The following is the June output of the Zaaiplaats Tin Mining Company, Ltd.: The mill of 15 stamps ran 27 days; tons ore crushed, 2,632; duty per stamp per 24 hours, 6·498 tons; average yield concentrates, 5·129 per cent.; concentrates won, 135 tons; average value of concentrates, about 68·95 per cent.; estimated working costs (including mining, milling, tramming, concentrating and roasting of concentrates, but not including realisation costs), £3,500; total development for the month, risen, driven and sunk, 456 feet; tons ore mined, 3,323; estimated profit for the month, not allowing for Government profit tax or head office expenses, £10,000. Development on No. 6, Roodepoort section, continues satisfactory, and the general indications are encouraging. The ore bodies, which still trend towards the Zaaiplaats boundary, continue of considerable size. The grade is satisfactory, and work is being pushed along as rapidly as possible. The company is entitled to one-third of the ore won during development on the leased portion, and this is now being put through the mill.

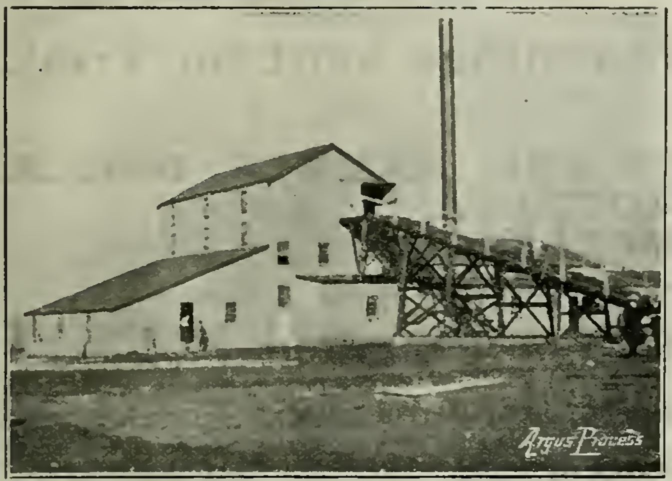
Rand Gold Mines.

New Heriot G.M. Co.

The returns for last month's operations at the New Heriot Gold Mines are as follows: Tons milled, 12,200; ounces recovered, 5,621; profit, £9,110.

City and Suburban.

The results of operations for June at the City and Suburban are as follows: Tons crushed, 27,449; gold recovered, 12,388 fine ozs ; profit, £21,676.



West Rand Unified Mill.

Labour Position.

The following labour figures for June are compiled and furnished by the Chamber of Mines:—Number of natives employed last month by members of the Witwatersrand Native Labour Association and contractors: On gold mines, 188,494; on coal mines, 8,549; on diamond mines, 15,430; total, 212,573.

Transvaal G.M. Estates

The following are details of the output for June at the Transvaal Gold Mining Estates:—Central Mines: Tons crushed, 11,200; yielding 7,561 ozs. fine gold, valued at £31,671. Elandsdrift Mine: Tons crushed, 644; yielding 681 ozs. fine gold, valued at £2,854. Vaalhoek Mine: Tons crushed, 1,329; yielding 384 ozs. fine gold, valued at £1,609. Total value of month's output, £36,134. Estimated profit for the month, £20,780.

Voorspoed Diamonds.

Messrs. E. Friedlander & Co., Ltd., secretaries, state: The following cable has been sent to the London transfer secretary for publication: "Publish quarterly returns. 200,176 loads hauled, 188,963 loads washed, 26,933 carats, average 14·253."

A discovery of carbonate of soda has been made at the Salt Pan, near Hamans Kraal, about 20 miles from Pretoria. A Johannesburg syndicate has leased the farm from the Government and are putting down boreholes, which so far have proved the deposit to extend to millions of tons, and it increases in value according to depth.

A nugget weighing 14 lbs. has been found by an alluvial digger at Kaapsche Hoop.

Outside Districts.

Ceylon Lydenburg Output.

The following are the details of the output for June at Ceylon Lydenburg: Tons crushed, 773; yielding 506 ozs. fine gold, valued at £2,103. Estimated profit for the month, £1,131.

Lydenburg Farms.

The payment of 6s. 8d. per share in cash in the reduction of capital in the Lydenburg Gold Farms is now being made. Shareholders are requested to send in their shares for the purpose of examination, etc.

Piggs Peak.

The following is the record of last month's operations by the Piggs Peak Development Company, Ltd., viz.: 25 stamps ran 26½ days; crushed, 3,161 tons, yielding 488·152 ounces; total recovery, 1,233·223 ozs.; value, £5,238; working expenses, including development, £2,157; profit, £3,081. Concentrates for June under treatment have been carried forward to July account. Time was lost repairing the Pelton wheel.

Pilgrims Rest Activity.

According to the *Pilgrims and Sabie News*, the Pilgrims Creek G.M. Co. will be able to "open cast" a considerable amount of their ore, thus making for low working costs. Glynn's Lydenburg seem to be a good line at 24s. The mynpacht of 342 claims is opening up well, and they are well ahead with development. Efforts are being made to get the telephone installed at Vaalhoek, and a petition is being sent to the authorities signed by all the residents. The R. Burnham Syndicate output for June is valued at £2,500, and there is every probability of July being more than this. The Mac-Mac Syndicate have been paying more attention to development of late, we understand, and a set sum of money is expended every month in exploiting the various reefs on the farm. On the next hill to the battery, nearer the town, reef has been located for half a mile, showing values from 6 to 25 dwts. over payable width. This undoubtedly will do much to place Mac-Mac to the forefront of our mines. The Miche claims on Graskop have seen a change, two of the syndicates selling out to Sabie men. Development is going ahead again now, and reports being exceedingly promising. It is hoped that the venture will meet with success and add another payable mine to the district. The Maid o' the Mist is forging ahead, having the reef in three places. They are well ahead with development, and have some good ore, values up to 2 ozs. being found. It is hoped that working costs will be low. Water is a difficulty in the dry season, and the management are at present undecided as to the advisability of putting down a gas engine, we hear. Possibly a change from the water-wheel to a Pelton may solve the problem. The C.B.M. mine at Ledouphine promises to be something solid, for, as far as can be seen, it is going to have a long and prosperous life. A heavy five-stamp mill has been ordered and will soon be erected.

Prospecting in German South-West Africa has been proceeding. Gold has been found at Chorichas and Choabendus in sufficient quantity to make it advisable to continue investigations. In Kaokofeld large deposits of iron ore have been located, containing over 60 per cent. of iron, which could probably be mined at small cost. The presence of these deposits should be an important factor in deciding upon the construction of the proposed railway from Port Alexander (Angola). Traces only were found of copper, and the prospects of finding tin are considered small. No coal was discovered.

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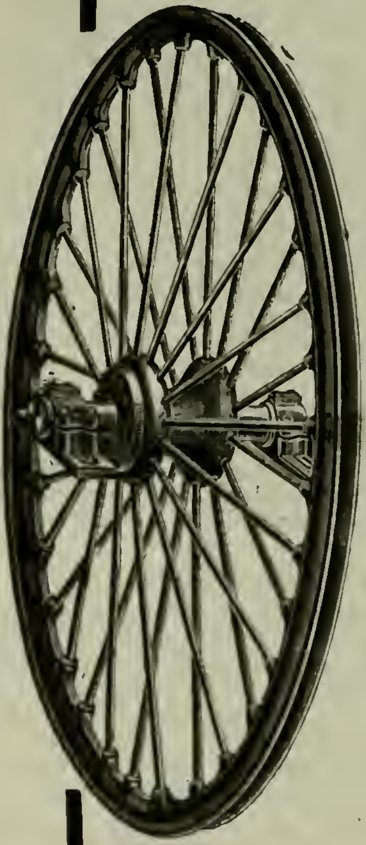

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Engineering Notes and News.

OXYGEN AND ITS USES.

Important New Rand Industry—Many Important Subsidiary Industries.

Extensive works are now about to be erected at the New Transvaal Chemical Works by the British Oxygen Co., Ltd., London, for the production of pure oxygen by the liquid air process. This company has extensive works in London, Cardiff, Birmingham, Manchester, Sheffield, Newcastle, Glasgow, and Australia. Briefly expressed, the process consists of liquefying the air completely in the first instance by the self-intensive system, and then, whilst obtaining almost complete transference of heat from the compressed air entering the apparatus to the liquefied air, the liquid is submitted to a special process of rectification, by means of which oxygen of any degree of purity up to 98 or 99 per cent. can be obtained. A typical small plant produces 17,000 cubic feet of oxygen per day. The plant is driven by a Diesel engine, which develops from 80 to 100 brake horse power, the engine being placed about the middle of the machinery. Air is compressed by a four-stage, belt-driven compressor. Between each stage of compression of air is restored to normal temperature by passing through coils contained in a cooler, through which water circulates. The system of purification of the air is very complete, all the moisture and carbonic acid being practically eliminated first in purifiers containing unslaked lime and calcium carbide, while the final traces of moisture are subsequently removed by freezing in a forecooler, which is employed partly for this purpose and partly to pre-cool the air before it enters the separator. The lower part of the forecooler is reduced in temperature by a small CO_2 refrigerating machine of the usual type, but the upper part is cooled by the waste nitrogen from the separator. The bottom of the separator contains liquid air, or, more correctly speaking, liquid oxygen; and the compressed air, on its way to the expansion point, is conveyed through this liquid, by which means it is largely condensed. It then passes through the regulating valve, at which point it expands, and it is ultimately discharged into the top of an inner central chamber, which forms the rectifying column in which the separation of oxygen and nitrogen is effected, oxygen descending in a liquid state to the bottom of the separator, and nitrogen ascending in a gaseous or vapourous condition to the top. The nitrogen is allowed freely to discharge into the atmosphere through the forecooler, as already explained, and the oxygen is allowed to boil off in any desired quantity by the adjustment of an oxygen discharge valve. Both gases, however, as already stated, on leaving the separator, are kept in intimate contact with the coils conveying the incoming air so that, before leaving the apparatus, the heat of the incoming air has been mostly transferred to the gases.

The Oxy-Acetylene System of Welding.

The value of oxygen for obtaining high temperatures in metallurgical work has long been recognised by engineers. The oxy-coal-gas system of lead burning was introduced by Brin's Oxygen Co. (now the British Oxygen Co.) many years ago, and has made such steady progress in the favour of lead workers that it has now to a large extent superseded all other systems. The oxy-hydrogen system of autogenous, or fusion, welding for more refractory metals than lead, has also in recent years, particularly in France, Germany, and Belgium, come into very general favour amongst engineers., having in many instances superseded electric welding, and now the oxy-acetylene system affords to engineers the most powerful and valuable method yet discovered of dealing simply and economically with an immense variety of metallurgical operations. The rapidity with which the oxy-acetylene blowpipe has been taken up by engineers in Britain and on the Continent is the most striking testimony as to its merits. The oxy-acetylene system of blowpipe welding is at present employed in two forms, which may be described as the high and low pressure system. The first to be introduced was the high pressure system, by which both gases are delivered to the plowpipe under pressure. Oxygen is supplied from an ordinary trade cylinder, and acetylene from a cylinder in which it is dissolved in a porous material soaked in acetone. Acetone is a liquid hydro-carbon, which has the property of absorbing 25 times it own volume of acetylene at atmospheric pressure, and it continues to do this for every atmosphere of pressure that is applied to the gas. This system affords an excellent and safe method of transporting acetylene, and it supplies engineers with the means of using the oxy-acetylene blowpipe in its most portable form. It has many useful applications, and for repair work generally, but more especially on board ship, this system is admirably adapted. All blowpipes employed with the low pressure system of oxy-acetylene welding are based on the injector principal first introduced in the Jackson jet and the oxy-coal-gas blowpipes for lead burning. In all injector blowpipes the oxygen, under a pressure of from 15 to 40 lbs. per square inch, is made to draw the necessary quantity of combustible gas into the blowpipe, and then deliver both gases well mixed and under sufficient pressure through the burner nozzle. In addition to acting on the injector principle already referred to, it must be very carefully designed and proportioned to meet all the special conditions with which the oxy-acetylene blowpipe must comply. To make it perfectly safe for use, it must be so constructed, even in the largest sizes, that the flame cannot strike back. The gases must be well mixed in a chamber of special construction before they issue from the nozzle of the blowpipe, and the nozzle itself so constructed that carbonaceous deposit in the orifice is entirely obviated. As regards cost, much depends on the nature of the work and the capacity of the workman, but it may be stated generally that the system compares very favourably with the cost of most rivetted or brazed jobs. It is not claimed that the system will supersede ordinary forge welding where that is applicable, but the blowpipe is such a clean, convenient, and portable tool that it enables a large variety of difficult welding to be done *in situ*, where rivetted or brazed joints would otherwise be necessary. It therefore greatly extends the scope of welding. Some idea of the strength of an oxy-acetylene blowpipe joint may be gathered from the fact that bars of Staffordshire iron fused together by this system have given tests of over 29 tons per square inch at the joint, and plates of iron and steel, varying in thickness from 20 gauge upwards, when welded together by the blowpipe have proved stronger at the joint than in the body of the plate. The speed at which work can be welded by the blowpipe varies to a considerable extent with the character of the job and the capacity of the workman. It may be stated, however, that any ordinary workman very quickly becomes proficient in the use of this blowpipe system, and a general idea of the speed at which work can be done may be gathered from the table below, in which the approximate foot-run of weld per hour on iron sheets is given corresponding to various blowpipes :—

	Inch.	Inch.	Inch.	Inch.
Thickness of plate	3-64	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$
Foot-run per hour	45	21	9	6

The above figures are results obtained when working on cold plates. By previously heating round the part to be welded in the case of plates of $\frac{1}{4}$ inch thickness and upwards, the time and cost may be reduced from 30 to 50 per cent.

General Applications of the Blowpipe.

It is impossible to enumerate in anything like detail all the work which may be executed by the oxy-acetylene blowpipe rapidly and economically, but the following are some of the applications for which it has already been advantageously employed :—

Iron and Steel.—The repair of steam boilers, boiler flues, and other apparatus *in situ*. The fusion jointing of pipes of every description and shape for steam superheaters, etc. The fusion welding of steel or iron tanks, etc. As a substitute for rivetting in thin sheet ironwork, such as enamel ware. In the manufacture of safes. The fusion welding of all joints in metallic casks, petroleum barrels, etc. The repair of cracks, blisters, and flaws in iron and steel castings, forgings, etc. The fusion welding of domestic and other hot water boilers. In the manufacture of iron or steel motor or other boats as a substitute for rivets. The fusion welding of frames, wheel rims, etc., for motor cars. The fusion welding (in place of brazing) of bicycle frames, forks, tee standards, wheel rims, etc. Artistic ironwork. As a substitute for brazing in nearly all instances.

Copper.—As a substitute for brazing in many kinds of copper work. By means of the blowpipe, copper pipes and many kinds of sheet copper structures can be fused together where brazing would otherwise be necessary. It is well known that in many instances accidents have occurred through the deterioration of brazed copper joints under galvanic action. This action is obviated by fusion welding, by which means a joint of equal strength can be obtained without any such liability to deteriorate. From the above particulars some opinion can be formed of the work for which the blowpipe may be advantageously used. In recent years oxygen has come very prominently into use for the purpose of cutting wrought iron and steel plates and structures of all sorts. The process is based on the well-known fact that a jet of oxygen directed upon a previously heated spot of metal ignites it, with the result that the metal, acting as its own fuel, burns away rapidly in the form of iron oxide.

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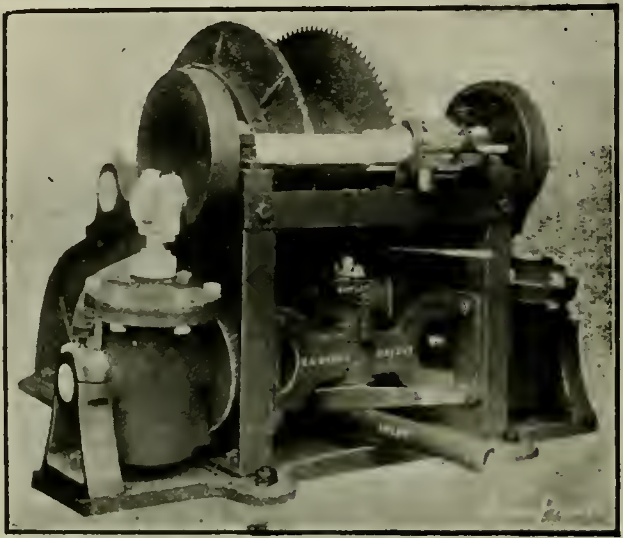

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Rope, 500 yards, ½″; Powerful Foot Brake.
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THE WEEK IN THE SHAREMARKET.

Still in the Doldrums—Paris Selling—Improving Outlook.

THE market is still in the doldrums and appears to be losing strength daily. Paris, for some reason of its own, continues to be a seller, and that fact has the usual weakening effect here and in London. Nevertheless, the situation is not without its good factors. The political horizon in Europe is brighter, the leaders of the Rhodesian market have settled their differences, labour recruiting and combination on the Rand may mean considerable saving. Whether these things are powerful enough to remove the prevailing apathy remains to be seen, but they are, at any rate, something to be grateful for. Meanwhile the outlook for tins and diamonds is improving, and, in these counters, early activity is expected.

	*	*	*	*		
	Friday, 5th.	Sat., 6th.	Monday, 8th.	Tuesday, 9th.	Wed., 10th.	Thurs. 11th.
African Farms ...	15 3B	15 3	15 3B	15 0B	15 3	15 0B
Adair-Usher Process	...	1 6S	1 6S	1 6S	...	..
Apex Mines ...	28 0	...	...	28 0B	...	27 6
Bantjes Consolidated	22 0B	...	...	22 0B	22 0B	22 0B
Benonis	4 6B	4 6	4 6B	4 9	4 9	4 7
Bushveld Tins ...	...	1 2B	1 2B	...	1 1B	1 1
Brakpan Mines ...	73 6S	72 0B	72 6B	72 0B	72 6B	72 6B
Blaauwbosch ...	20 0B	21 0	20 0B	21 0B	21 0B	21 0B
British S A. ...	...	26 6B	...	26 0B	..	26 0B
City and Suburban ...	46 6B	46 6B	47 0B	47 0B	47 0B	46 0B
City Deeps	55 6B	56 0B	56 0B	56 0B	55 6B	55 6B
Cloverfield Mines ..	4 9B	4 9B	4 10B	5 3	5 0B	5 0B
Cons. Langlaagtes ...	22 3B	22 0B	22 3B	22 3B	22 3B	22 3
Cons. Main Reefs ...	18 6B	19 0	19 6	19 0	19 0	18 9B
Coronation Freeholds	0 6	..	..	0 4B	0 6B	..
Clydesdales	...	...	..	11 3B	...	...
Cons. Mine Selections	12 6B	13 0	...	...	...	...
Crown Diamonds ...	...	4 0S	4 0S	...	...	4 0S
Crown Mines	130 0B	130 0B	130 0B	...	130 0B	...
Concrete Cons. ...	...	..	6 0B	5 0B	6 0B	...
East Rand Cent. ...	9 0B	9 3B	9 0B	9 0B	9 0B	9 3
East Rand Coals ...	2 4B	2 4B	2 4B	2 4B	2 4B	2 4B
East Rand Deeps ...	2 0B	2 1B	2 1B	2 1	1 11	..
East Rand Props. ..	56 6B	56 0B	56 0B	57 0B	57 0B	56 0B
East Rand Deb. ...	£92	£92	...	£92	£92½	£91
Eastern Gold Mines	1 9B	1 10B	1 9B	1 9B	1 9B	1 9B
Frank Smith Diam...	9 3S	8 3B	8 0B	...	...	8 6B
French Rands ...	1 0B	..	1 0B	1 0B	1 0B	1 0B
Govt. Areas... ...	23 3B	23 9	23 6B	23 3	23 0	22 9
Glynn's Lydenburgs	25 0B	25 0B	25 0B	25 6B	...	26 0B
Ginsbergs	27 0B	27 0B	28 0B	26 9B	27 6B	27 0B
Glencairns	..	...	...	...	3 9B	4 0B
Glencoe (Natal) Colls.	...	6 3S	...	...	5 6B	5 9B
Geduld Props. ...	21 0B	21 0B	21 0B	21 0B	...	20 0B
Jupiters	...	...	10 9S	10 6S	9 0B	9 0B
Kaalfontein Diamonds	...	...	...	...	0 6B	0 7S
Klerksdorp Props. ...	3 0B	3 0B	...	3 0B	...	...
Knight Centrals ...	13 3B	13 3B	13 3B	13 3	13 0B	13 3
Luipaardsvlei Estates	7 3B	7 3B	7 6B	7 6B	7 6B	7 6B
Lace Props.	...	...	3 0B	3 0B	3 4B	3 0B
Lydenburg Gold Farms	2 0B	2 0B	2 0B	2 1B	2 1B	2 1B
Main Reef Wests ...	24 3B	24 6	24 6	25 0	24 9B	25 0
Modder B's	57 3	57 0B	57 6	57 0B	57 6B	58 0B
Midas Deeps ...	0 6S	0 6S	0 6S	0 6S	0 3	...
Middelvlei Estates...	1 5B	...	1 4B	1 4B	1 3B	1 4B
Modder Deeps	...	...	...	...	...	25 3B
New Eras	7 6S	7 0B	...	...	..	7 0B
New Kleinfonteins...	28 3	28 0B	28 0B	28 3B	28 0B	27 9B
New Rietfonteins ...	7 6B	...	..	7 6B	...	8 0B
New Unifieds ...	18 0S	18 0S	18 0S	18 0S	18 0S	17 0B
New Boksburgs ...	2 0S	...	...	...	1 6B	..
Nourse Mines ...	...	35 0B	35 0B	35 0B	35 0B	35 0B
New Heriots ..	...	...	..	85 0B	85 0B	...
Orange Diamonds ..	1 5B	1 5B	1 5B	1 4B	1 4B	1 4B
Pigg's Peaks ...	11 6B	...	11 6B	11 6B	11 6B	11 6B
Premiers Deferred	...	180 0B	...	...	..	..

B Buyers. S Sellers.

	Friday, 5th.	Sat., 6th.	Monday, 8th.	Tuesday, 9th.	Wed., 10th.	Thurs. 11th.
Pretoria Cement Co.	53 6S	...	53 6B	50 0B	...	50 0B
Pretoria Estates ...	...	...	...	...	17 6S	...
Paardekraal Estates	0 6B	0 6B	0 6B	0 6B	0 6B	0 6B
Princess	0 9B	10 3	10 3B	...	...	...
Rand Collieries ..	7 0B	...	...	...	...	..
Rand Nucleus ...	2 9B	2 9B	2 9B	2 9B	...	2 9B
Randfontein Estates	26 3B	26 6B	27 0	26 9	26 3B	26 6
Randfontein Deeps...	4 0B	4 0B	4 0B	4 0B	4 0	4 0B
Rooiberg Minerals ..	33 0	33 0S	32 9B	32 6B	32 6B	32 3
Rand Klips	4 4B	4 4B	4 5B	4 6B	4 4B	4 5B
Ryan Nigels ...	3 9B	3 9B	3 9B	3 9B	3 9B	3 9B
Simmer Deeps ...	4 0S	...	...	3S	...	..
South African Lands	4 2B	4 3	4 2B	4 1B	4 2	4 0B
S. Randfontein Deeps	3 3B	3 3B	3 0B	...	...	3 3B
Sub Nigels	5 0B	5 3B	5 0B	5 0B	5 0B	...
Springs Mines ...	...	...	15 6S	15 6S	15 6S	15 6S
Trans. G.M. Estates	..	...	43 0B	43 0B	...	..
Temple Tins	...	3 0B	3 0	3 3S	3 3S	3 3S
Trans. Coal Trusts...	44 6S	15 0S	43 0S	43 9	43 0B	44 0S
Tudors	...	...	..	1 0B	1 0B	...
Van Ryn Deeps ...	16 6B	16 9B	17 0B	17 0B	17 0B	17 0
Village Deeps ...	...	..	39 0B	...	38 0B	38 6B
Vogel. Cons. Deeps...	0 6B	1 1S	1 1S	1 0	1 1S	...
Voorspoed Diamonds	8 0B	10 0S	10 0S	10 0S	8 0B	8 0B
Van Dyks	1 0B	...	...	...	2 0B	1 0B
Wit Townships ...	22 0B	..	...	...	..	24 0
Witwatersrands ...	...	...	51 0B	...	51 0B	51 0B
Wolhuters	20 0	20 0	19 9B	19 9B	19 9B	19 9
Witbank Collieries...	42 6B	42 6B	42 6B	42 6B	42 6B	42 6B
Wit. Deeps	...	46 6B	...	...	...	..
West Rand Est. ...	...	...	...	...	..	2 6B
Zaaiplaats	45 0	44 6B	44 6	43 0	42 0B	41 6

B Buyers. S Sellers.

ANSWERS TO CORRESPONDENTS.

"Investor."—Whaling concerns are being overdone. Leave them alone.

"Tin."—No report is yet obtainable.

"Rho."—The outlook for the company is brighter since Sir Abe Bailey settled his differences with Amalgamated Props.

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Finance, Commerce, and Industries.

Railway Rates Reductions.

The Lourenco Marques *Guardian* understands that the reductions in railway rates proposed at the recent meeting of the joint board in Capetown, whereby the Portuguese section of the eastern through route would suffer an approximate loss of £22,000 annually, has been postponed. This and other changes in the tariffs to secure a still closer approach to the convention obligations in respect of the division of oversea traffic will be dealt with at the next meeting of the Board in August.

* * * *

Irrigation.

In the course of his report for the year 1911, Mr. Kanthack, Director of Irrigation for the Union, states that it is proposed to make a new circle, with headquarters at Graaff-Reinet, which will relieve the Cape, Midland, and Lower Orange River circles. This new circle, which will complete the full number authorised, will also open up a very large area of the central Karoo, which has been sorely neglected and is full of potentialities.

* * * *

Artificial Manure.

A report from H.M. Acting-Consul at Christiana, Norway, states that the local newspapers have signalised the production of a new artificial manure, which has received the name of bi-phosphate. This is stated to be actually a by-product in the manufacture of nitrate of lime at the Notodden Works. The nitric acid produced in making nitrate of lime is used to dissolve apatite (bone earth) or other raw material, and the manure is produced by subsequent treatment of the product. It is expected that the price of the new manure will be low: its chief use will be the replacement of superphosphate and basic slag.

* * * *

Helping the Fruit Farmer.

Evidence of the practical sympathy with farming industries which a State may show is afforded in the proposal of the New South Wales Government to establish fruit-canning, vegetable-canning, and jam-making factories in the Burrinjuck Irrigation Area on the Murrumbidgee. At these factories the produce of the settler will be handled at moderate rates, and, subsequently, the factories may be taken over by the settlers themselves, under a co-operative arrangement. The experiment will be carried on by the Department of Agriculture. The fruit-growers will be encouraged to plant only the best varieties of fruit, and will be taught how to specialise in those varieties that are most useful for canning purposes.

* * * *

Brewery Profits.

The directors of the South African Breweries, Limited, recommend a dividend of 10 per cent. on the ordinary shares, making 17½ per cent. for the year, less income-tax, placing £20,000 to reserve and carrying forward £37,394. The report of Ohlsson's Cape Breweries for the year ended March 31 states that the profit, after charging working expenses, repairs, and maintenance of freehold and leasehold properties, and after making provision for bad and doubtful debts, amounted to £77,393, making with interest on investments, fees, and the amount brought forward a total of £122,398. It is proposed to pay a dividend of 7 per cent. on the ordinary shares, carrying forward £45,361.

* * * *

Real Estate Corporation.

The report of the Real Estate Corporation of South Africa, Limited, to be presented at the meeting on the 26th instant, covers the financial year ended March 31, 1912, and shows a net profit for the year of £17,668, an increase of £3,368. The capital expenditure during the year amounted to £816, on Johannesburg properties. There has been no capital expenditure on Kimberley properties, which stand at the same figure as last year. A sum of £1,000 has been written off against depreciation of the corporation's properties, which now stand at £224,481. The balance from last account, after payment of the final dividend of 5 per cent. for the year was £13,142, and the balance at credit of profit and loss, after payment of two interim dividends of 2½ per cent. each, and the deduction of the £1,000 written off against depreciation, is £22,311, out of which the directors recommend the payment of a final dividend of 5 per cent., making 10 per cent. for the year. This will absorb £7,500, and leave a balance to carry forward of £14,811.

* * * *

Beira Railway.

In the twelve months ended September 30 last the gross receipts of the Beira Railway amounted to £555,524, or an increase of £119,229, whilst working expenses at £173,106 were only £30,299 higher. This improvement has been more than maintained since, for the gross revenue of the seven months ended April 30 last came to £310,699, as compared with working expenses £123,407. Out of the net receipts of the year ended September 30 last the company claimed £161,553 as its proportion, and including other revenue the net balance was £177,506. After providing for interest charges and setting aside £30,000 for depreciation and renewals, a balance of £55,240 was left, which reduced the debit balance brought forward to £301,037. The interest on the 6 per cent. income debenture stock for the year ended September 30, 1910, was paid on January 15 last, and the earnings for the year are sufficient to pay the interest to September 30, 1911. The company is thus approaching the time when the whole of its debenture debt will receive its interest.

* * * *

Leasehold Townships Commission's Report.

A blue-book was issued last week containing the report of the Commission appointed by Lord Selborne in April, 1910, to investigate the question of leasehold townships in the Transvaal. The following is a summary of the recommendations:—(1) That taxation of site value is the best and only available means to bring about fair and equitable terms and conditions for the conversion of leasehold into freehold in semi-Government and private leasehold townships. (2) That the municipalities of the Transvaal be empowered to adopt that system of rating, and to take certain steps to assist the standholders to obtain freehold. (3) That in order to prevent evasions of the Townships Act, 1908, the prohibition of sale in leasehold by township owners contained in section 20 (1) be extended to companies and individuals. (4) That any stand in a semi-Government or private leasehold township sold in freehold after the commencement of the Townships Act, 1908, shall be subject to the same restrictions as to the uses to which it may be put as are the leasehold stands in the same township. (5) That all agreements allowing the township owner to recover his share of the rates from the standholder be cancelled. (6) That all agreements be cancelled under which standholders' improvements become the property of the township owner without compensation at the end of the lease, and that the standholder be compensated on the basis of the unexhausted value of his improvements. (7) That all absolute prohibitions in leases, *e.g.*, against coloured occupation, sale of liquor, sub-divison, etc., be retained in the leases and incorporated in the freehold title when granted; and further, that municipalities shall be given the power and be vested with the duty to see them enforced. (8) That all discretionary or permissive powers reserved to township owners in the leases be cancelled, *e.g.*, power to give the right to open a shop—and that all these powers shall be vested in the Municipality. (9) That all agreements shall be cancelled exacting payment of a registration fee to township owners or their agents on transfer of a leasehold stand.

Kynoch's Position.

After a number of years of depression some gratifying signs of recovery are apparent in the results of Kynoch, Ltd., the well-known manufacturers of explosives. The report just issued marks yet another advance from the low water mark of 1907-8. It is true no resumption of distributions has yet been made on the Ordinary shares, whose long run of 10 per cent. payments came to an untimely end in 1906-7. An increased amount was, however, set aside during the past year for capital expenditure, as well as an allowance for bad debt reserve, and with any continuity of the past year's earning capacity it should not be long before the ordinary shareholders again get a return. Difficulties have been experienced by manufacturers of explosives for some time past, but the Directors report a satisfactory increase of business for the past year, and the other forms of manufacture in which the company engages have also doubtless contributed to the improved result. The policy of decentralisation in which the company has lately been engaged, culminating in the formation of Kynoch-Arklow, Ltd., at the commencement of the present year is also expected to prove of considerable benefit to the undertaking. The company took over the whole of the Kynoch business in high explosives, apart from the South African portion, which is still worked from Durban, the purchase consideration being the whole of the ordinary shares and £165,000, partly in cash and partly in debentures. The prospects of the new subsidiary are looked upon as very hopeful.

* * * *

Commerce and the Rate Reductions.

Discussing the new railway rate reductions at the Chamber of Commerce last week, Mr. Philpot expressed the view that two months' notice of reductions in rates was scarcely sufficient. In the event of big reductions such should be spread over a period of twelve months, with notice of part reductions every two months. The handicap to the inland merchant would be thus lessened. Mr. W. A. Martin dealt with various items in the reduced tariff list, observing that when reductions were going to be made to such extraordinary extent as there shown, they should be spread over a longer period. Otherwise the immediate effect was to give coast merchants an advantage over those inland, who had paid railway transport and suffered serious loss. He advised that a deputation should meet Mr. Burton (Minister of Railways) when he came north. Mr. Hillman alluded to the imported timber rate under the proposed new tariff, considering the rates on manufactured articles adversely affected the local manufacturer. All planed timber goods were now classified under the 24s. 2d. reduction per ton. All that was now needed was to plane a shaving from a board and the goods came through at special rates. Everything, asserted Mr. Hillman, was being done to induce people to have work done at the coast. The present Railway Administration, in his view, was less sympathetic towards the inland towns than had been the old one. It was extremely hard, because skilled whites were employed on the work locally, whereas coloured men, who could live on very little, were engaged at the coast. Everything was being done to prevent people manufacturing here.

* * * *

Port and Harbour Policy.

The *Cape Times* publishes an interview with Mr. Ludwig Weiner with reference to such of the recommendations of the Ports Advisory Committee as are to be carried into effect. Mr. Weiner said he understood the first report of the Committee, which is public property, and the supplementary report, which is not yet issued, had been considered by Mr. Sauer and the Railway Board, and that definite decisions had been arrived at on the various points raised. Mr. Weiner, who was the chairman of the Ports Advisory Committee, said he had not seen any actual decisions of the Railway Board or the Minister, but he had been told some of the salient points which affected the Union ports, and it was satisfactory to note that many of the recommendations of the Inquiry Committee had been adopted by the Railway Board. The principal decision referred to wharfage. He understood it was the intention to make wharfage charges uniform at all Union ports irrespective of the destination of goods. The charge would be of a comprehensive nature, and the suggestion was that all exports should be free of wharfage, though charges would be levied for services rendered. He understood that crane charges were to be made uniform at all ports. The charges for dry docks and slips would also be uniform. It was the intention, he understood, to bring in the Durban tariff, which was lower than that in force at Capetown. Landing work at Durban would be undertaken by the Administration, as was the case at the other ports of the Union. In respect of coaling at Durban and Capetown, the arrangements prevailing at these ports were, as far as practicable, to be brought into line. The same system would prevail at the other ports. The recommendation of the Advisory Committee with regard to the water supply to shipping had been adopted, and there would be a uniform price for water at all ports, the minimum charge being 7s. 6d. per thousand gallons. The next point, said Mr. Weiner, was of great importance, but would only come into practice as soon as rebates were abolished. This would come about if the negotiations which were still in progress between the Government and Sir Owen Philipps were finally and satisfactorily concluded in London. Assuming that such would be the case, he understood that ship dues on vessels as well as light dues, and charges for pilotage and towage in and out of harbour, docks rivers, would be abolished. The only exception would be towage to or from the sea.

* * * *

Report on Cape Insolvencies, 1911.

Mr. Hy. Gibson contributes the following to the annual report of the Capetown Chamber of Commerce:—I have to acknowledge the courtesy of the Government Department concerned for placing me in a position to supply the following information, as the figures have not apparently been presented to Parliament, as was the case prior to Union. *Insolvencies.*—The surrenders have been as follows:

Cape Province.

	1909.	1910.	1911.
Voluntary	623	320	229
Compulsory	148	84	86
	771	404	315
Total assets (estimated in the case of compulsory sequestrations)	£1,092,799	£409,122	£246,121
Total estimated liabilities ...	1,658,247	656,922	503,996
Percentage of assets to liabilities	65·91	62·27	48·82

Cape District only.

	1909.	1910.	1911.
Voluntary	132	75	50
Compulsory	63	40	34
	195	115	84
Total assets (estimated in the case of compulsory sequestration)	£509,327	£141,883	£79,288
Total estimated liabilities ...	746,330	254,383	137,473
Percentage of assets to liabilities	68·25	55·77	57·67

The number of rehabilitations have been 123, 164 and 212 respectively for the several periods. The figures given are, as on previous occasions, approximate only, since the assets and liabilities in the case of voluntary surrenders are taken from the schedules filed by the insolvents, and in the case of compulsory sequestrations the information has been taken from actual results where the liquidation accounts have been filed. In a few instances only has it been impossible to obtain fairly accurate particulars. Last year attention was called to the fact that the figures were the lowest for the Province since 1902, and for the Cape District since 1903, and on the present occasion the figures again show a marked improvement, those for the Cape District having returned to the normal. The number of insolvencies has fallen considerably, whilst the amounts involved were approximately one-half those of the previous year. The percentage of assets to liabilities in the two tables apparently tends to show that different forces are at work in the towns and their hinterland, and I have therefore prepared the following table distinguishing the figures at the coast ports from those relating to the other districts:—

	No.	*Assets.*	*Liabilities.*	*Percentage A. to L.*
Cape	84	79,288	137,473	57·67
East London	10	6,715	11,330	59·29
Knysna	2	237	547	43·63
Port Elizabeth	9	5,000	8,135	61·72
	105	91,240	157,485	57·93
Other districts	124	154,881	346,511	44·70
Total for Province	229	246,121	503,996	48·82

It will be noted that the percentage of assets to liabilities in the up-country districts is considerably less than the average at coast ports, and, in view of the fact that the bulk of the liabilities in the Cape District were no longer attributable to loans on landed property, this aspect of the figures was difficult to explain. In looking through the records, however, I find that one large partnership failure in an inland town figures as four estates with assets £10,000 and liabilities £91,728. This was a firm with three partners—one estate, that of the partnership, held all the assets, whilst the liabilities, of course, were proved against all the estates. Though this is the true legal position, a more correct view from the business man's standpoint would be to treat it as one failure with assets £10,000 and liabilities of, say, £22,932. As has been pointed out on previous occasions, these returns are always liable to cases of this sort. They were very prevalent during the period which followed the recent property boom in the Cape Peninsula. I purpose continuing the table given above for some years at least, as possibly it may develop useful aspects The figures, having returned to a normal basis, leave little scope for remark beyond noting that the improvement to which attention was called in my last report has been continued during 1911 The continued anxiety shown by insolvent traders to secure rehabilitation is also a very healthy sign—over 200 such cases having been dealt with, against 123 two years ago It must always be remembered that the figures given in these returns do not include those estates being dealt with under deeds of assignment, for which no figures are available Taking the position all round, there is cause for congratulation in the improved positon and prospects as disclosed by the figures for 1911

Tenders Accepted.

The South African Railways have accepted the following tenders for May:—Jarrah hardwood sleepers: Mr. Jac. Loopuyt—100,000, at 4s. 4d. each, £21,666 13s. 4d. Castor oil: Messrs. Thos. Barlow and Sons, Durban—castor oil for Durban, 10,550 imp. galls., at 2s .7d. per gallon (delivered ex ship), £1,362 14s. 2d. Mealie meal, white: Transvaal Milling Co., Johannesburg—1,000 muids, at 9s. 9d., £487 10s.; 2,000 muids, at 9s. 10½d., £987 10s.; 3,000 muids, at 10s., £1,500; 710 muids, at 10s. 1½d., £359 8s. 9d.; (f.o.r., Kazerne); total, £3,334 8s. 9d.; Mr. A. H. Martin, Ladysmith, 700 muids, at 10s. 5d., £364 11s. 8d. (fo.r., Ladysmith). Bridgework—Umfulosi Bridge: Messrs. Horseley and Co.—for C.I. piles, £747 10s: Messrs. Findlay, Alexander and Co.—for steelwork, £1,810. Maitland erection of station buildings: Mr. J. Liston. Capetown, £1,543. Springs Cartage Contract: Messrs. R. T. Matthews and Co.—at 1s. 5d. per ton of 2,000lbs. Coal plant, Capetown—structural steelwork: The Thames Ironworks and Shipbuilding Co.—structural steelwork (delivery f.o.b.). £3,895. High-sided bogie wagon—300: Purchase of 300 high sided bogie wagons from the Leeds Forge Co., at £367 each (f.o.b.). Steelwork—Braamfontein Loco. Shed and Workshops: Messrs. Powers, Deane and Ransomes (delivered f.o.b.), £3,750. Baltic Timber: Messrs. Mackie, Dunn and Co., Port Elizabeth—delivered at Port Elizabeth—Deals, 9in. x 3in., thirds, standard 15, at £14 7s. 6d., £215 12s. 6d.: Deals, 9in. x 3in., thirds, standard 91.299, at £15, £1,369 9s. 8d.: ceilings, 6in. x ½in., Colonial firsts, standard 7, at £13 6s. 5d. £93 1s. 11d.; floorings, 6in. x ⅞in., standard 9, at £12 16s. 9d., £115 10s. 9d.: total £1,793 17s. 10d.; delivered at East London—deals, 9in. x 3in., thirds, standard 39, at £14 3s. 10d., £553 9s. 6d.; ceilings, 6in. x ½in., Colonial firsts, standard 26, at £13 2s. 1d., £340 14s. 2d.; flooring, 6in. x ⅞in., Colonial firsts, standard 40, at £12 12s. 8d., £505 6s. 8d.; total, £1,399 10s. 4d.; delivered ex ship Durban—deals, 9in. x 3in., thirds, standard 290, at £14 3s. 10d., £4,115 11s. 8d.; ceilings, 6in. x ½in., Colonials firsts, standard 30, at £13 2s. 1d., £393 2s. 6d.; floorings, 6in. x ⅞in., Colonial firsts, standard 57, at £12 12s. 8d., £720 2s.; total £5,228 16s. 2d. Scrap—sale of: F. W. Harris, Birmingham—Item 1, brass boiler tube ends, 1½ tons (ton of 2,000 lbs.), at £43 15s., £65 12s. 6d.; item 9, brass boiler tubes, 8 tons (ton of 2,000lbs.), at £44 15s., £358; item 15, brass boiler tubes, 13 tons (ton of 2,000lbs.), at £44 17s. 6d., £593 7s. 6d.; item 16, brass boiler tubes, 20 tons (ton of 2,000 lbs.), at £45 2s. 6d., £902 10s.; item 21, copper turnings and filings, 2 tons (ton of 2,000lbs.), at £53 10s., £107; item 33, red metal boiler tubes, 116 tons (ton of 2,000lbs.). at £50 5s., £5,829; item 35, brass boiler tubes, 3½ tons (ton of 2,000lbs.), at £45 5s., £158 7s. 6d.; item 38, brass boiler tubes, 20 tons (ton of 2,000lbs.), at £43 12s. 6d., £872 10.; total, £8,876 7s. 6d.; A. Brown and Co., Johannesburg—item 2, brass and copper cuttings, 1½ tons (ton of 2,000lbs.), at £49 18s. 7d., £74 17s. 11d.; item 5, copper scrap, 4 tons (ton of 2,000lbs.) at £58 12s. 3d., £234 9s.; item 12, copper and brass borings and turnings, 3½ tons (ton of 2,000lbs.), at £35 16s. 4d., £125 7s. 2d.; item 13, copper scrap, 22 tons (ton of 2,000lbs.), at £58 12s. 3d., £1,289 9s. 6d.; item 18, copper and brass turnings, 1 ton (ton of 2,000lbs.), at £37 19s. 9d., £37 19s. 9d.; item 22, copper scrap, 800lbs., at £2 16s. 4d. 100lbs., £22 10s. 8d.; item 23, copper electrolyte, ½ ton (ton of 2,000lbs.), at £58 12s. 3d., £29 6s. 2d.; item 24, Stones bronze studs, 3 tons (ton of 2,000lbs.), at £41 10s. 4d., £124 11s.; item 25, Stones bronze turnings and filings, 3 tons (ton of 2,000lbs.), at £35 16s. 4d., £107 9s.; item 26, Stones bronze scrap, 7 tons (ton of 2,000lbs.), at £41 10s. 4d., £290 12s. 4d.; item 28, brass scrap, 300lbs., at £1 16s. 10d. 100lbs., £5 10s. 6d.; item 34, copper boiler tubes, 1½ tons (ton of 2,000lbs.), at £59 14s., £89 11s.; item 36, copper pipes, 10 tons (ton of 2,000lbs.), at £54 14s. 6d., £547 5s.; item 37, copper wire and turnings. 7 tons (ton of 2,000lbs.), at £55 2s., £385 14s.; item 39, brass scrap, 1½ tons (ton of 2,000lbs.), at £33 18s., £50 17s.; total, £3,415 10s. Items 1 to 9 delivered in trucks at Stores Yards, North End; items 12 to 15 delivered in trucks at Uitenhage Station; items 16 and 18 delivered in trucks at Stores Yard, East London; items 21 to 25 delivered in trucks at Stores Yard, Durban; items 37 to 39 delivered in trucks at Pretoria Station. D. V. Garnham, Johannesburg—item 7, rubber scrap, 276lbs., lot at £2 10s., £2 10s.; item 29, zinc sheets, ½ ton (ton of 2,000lbs.), at £15, £7 10s.; item 30, lead, etc., 2 tons (ton of 2,000lbs.), at £5 10s., £11; item 43, red metal boiler tubes, 3 tons (ton of 2,000lbs.),, at £48, £144; item 45, nickle, 1¾ tons, at £4 10s., 100lbs., £157 10s.; total, £322 10s.; J. McLeod, Grahamstown—item 10, steel boiler tubes, 25 tons (ton of 2,000lbs.), at £4, £100; Henry Jacobs and Co., London—item 14, brass borings etc. 9 tons (ton of 2,000lbs.), at £42 11s. 11d., £33 7s. 3d.; item 27, white metal, bronze, and copper scrap, 2 tons (ton of 2,000lbs.), at £38 11s. 4d., £77 2s. 8d.; item 40, brass turnings, etc., 4 tons (ton of 2,000 lbs.), at £36 11s. 4d., £146 5s. 4d.; total, £606 15s. 3d.: Carter and Co., Port Elizabeth—item 3, wrought iron boiler, etc., 1 only lot, at £18 5s., £18 5s.; item 17, iron boiler tubes, 25 tons (ton of 2,000 lbs.). at £3 3s. 6d., £79 7s 6d.; total, £97 12s. 6d. (items 3 to 10 delivered in trucks at Stores Yard. North End; item 14 delivered in trucks at Uitenhage Station; item 17 delievred in trucks at Stores Yard, East London; items 27 to 30 delivered in trucks at Stores Yard, Durban; items 40 to 45 delivered in trucks at Pretoria Station); R. Scott and Co., Durban—item 31, rubber scrap, etc., 1,300lbs., at 21s. 100lbs., £13 13s.; W. Spilhaus and Co., Capetown—item 42, brass, white metal, etc., 1½ tons (ton of 2,000lbs.), at £33 3s., £49 14s. 6d.; L. Flekser and Co., Johannesburg—item 44, rubber scrap, ½ ton (ton of 2,000lbs.), at £14 11s. 8d., £7 5s. 10d.; R. Neugebauer, Capetown—item 47, lead, etc., 10 tons (ton of 2,000lbs.), at £6 5s., £62 10s. (item 31 delivered in trucks at Stores Yard, Durban: items 42 and 44 delivered in trucks at Pretoria Station; item 47 delivered in trucks at Braamfontein Station). Sleepers: Messrs. Burt, Bolton and Haywood—83,000 creosoted sleepers, at 2s. 8½d., each (delivered f.o.b. London). Structural steelwork for new store, Pretoria: Messrs Wood and Co—steelwork (f.o b., £3,330.

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New Companies.

African Laundries, Ltd., 107, Fourth Street, Booysens Reserve, Johannesburg; registered June 5; capital, £400.

Pretoria Premier Gold Mine, Ltd., Cullinan Buildings, Main Street, Johannesburg; registered June 5; capital, £15,000.

Koedoe Pharmacy, Ltd., 213, Pretorius Street, Pretoria; registered June 5; capital, £4,000.

Cigarettes, Ltd., Reserve Investment Buildings, Fox and Rissik Streets, Johannesburg; registered June 5; capital, £1,000.

Rietfontein-Van Ryn Extension Syndicate, Ltd., Transvaal Bank Buildings, Fox Street, Johannesburg; registered June 5; capital. £40,000.

The Red Cross Pharmacy, Ltd., 2, Geranium Street, La Rochelle, Johannesburg; registered June 6; capital, £300.

G.E.A. Syndicate, Ltd., Consolidated Buildings, Fox Street, Johannesburg · registered June 8; capital, £1,200.

Goldfields Wine and Spirit Co., Ltd., Standard Buildings, Commissioner Street, Boksburg; registered June 12; capital, £3,000.

Clapham's Mining Timber Co., Ltd., Mutual Buildings, Harrison and Commissioner Streets, Johannesburg; registered June 12; capital, £100.

Dunswart Brick Co., Ltd., Orr's Buildings, Benoni, Transvaal; registered June 13; capital, £2,000.

Fortuna Diamonds, Ltd., Consolidated Buildings, Fox Street, Johannesburg; registered June 14; capital, £9,000.

Hoare's Motor Supplies, Ltd., 16 Marshall Street, Johannesburg; registered June 14; capital, £3,000.

Chudleigh Bros., Ltd., Mount's Bay House, Pritchard Street, Johannesburg; registered June 14; capital, £230,000.

Brinkmann, Ltd., Erf 165, Prince Street, Bloemhof, Transvaal; registered June 19; capital, £750.

Transvaal Property and Investment Co., Ltd., 21, Alexandra Buildings, Church Square, Pretoria; registered June 22; capital £400,000.

The African Illustrated Newspapers Co., Ltd., 158, Market Street, Johannesburg; registered June 24; capital, £800.

Macdonald and Thorpe, Ltd., 25, Erasmus Buildings, Church Square Pretoria; registered June 25; capital, £750.

De Wet and Joubert, Ltd., 219, Pretorius Street, Pretoria; registered June 25; capital, £100.

The Blue Lime Association, Ltd., Cullinan Buildings, Simmonds Street, Johannesburg; registered June 26; capital, £600.

Norcar Gold Mining Co., Ltd., 14 Transvaal Bank Buildings. Fox Street, Johannesburg; registered June 26; capital, £25.000.

Height and Haddow, Ltd., 51 and 52, Permanent Buildings, Harrison Street, Johannesburg; registered June 28; capital, £3,000.

Notices of Reduction and Increase of Capital

Lydenburg Gold-Farms Co., Ltd., Johannesburg; registered June [illegible] capital decreased from £250,000 to £50,000.

Aurora West United Gold Mining Co., Ltd., Johannesburg; registered June 15; capital decreased from £212,705 to £106,352 10s.

Ferreira Deep, Ltd., Johannesburg; registered June 18; capital increased from £910.000 to £980,000.

The New Rand, Ltd., Johannesburg; registered June 25; capital increased from £135,802 to £136,457.

Engineering Supplies, Ltd., Johannesburg; registered June 25; capital increased from £28,000 to £30,000.

In Liquidation.

Thomas and Morris, Ltd., Johannesburg, voluntary.

New Orion Mynpacht Gold Mining Syndicate, Ltd., Johannesburg, voluntary.

Transvaal Mines Labour Co., Ltd., Johannesburg, voluntary.

All Red, Johannesburg, voluntary.

Ferreira Gold Mining Co., Johannesburg, voluntary.

West Rand Unified, Ltd., Johannesburg, voluntary.

Seta Diamonds, Ltd., Johannesburg, voluntary.

Buxtons', Ltd., Pretoria, by order of the Court.

Jefferson, Ltd., Johannesburg, by order of the Court.

Notices of the Situation of Registered Office.

3721. Cement and Concrete Co., Ltd., B. and T. Buildings, 68, Commissioner Street, Johannesburg.
3328. Henley-on-Klip Township, Ltd., 15, Simmonds Street, Johannesburg.
2839. Landskroon Diamond Syndicate, Ltd., 107, Exploration Buildings, Commissioner Street, Johannesburg.
3319. Union Bioscope Co., Ltd., 42, Human Street, Krugersdorp.
3886. Stobie Respirator Co., Ltd., 28, Cullinan Buildings, Main Street, Johannesburg.
2734. Reid and Chicken, Ltd., 105-106, Exploration Buildings, Commissioner Street, Johannesburg.
2969. Imperial Gold Mining Syndicate, Ltd., Commissioner Street, Johannesburg.
3572. Walker Rogers, Ltd., 1 Carlton Hotel Buildings, Johannesburg.
3912. Savoy Theatres, Ltd., The Savoy Theatre, Market Avenue, Benoni.
1195. Wolvefontein Estate and Gold Mining Syndicate, Ltd., 19a, Simmonds Street, Johannesburg.
1813. Klippoortje Estates, Ltd., 19a, Simmonds Street, Johannesburg.
3771. M. A. Kalter, Ltd., 94, Standard Bank Chambers, Commissioner Street, Johannesburg.

Contracts Open.

The Municipal Council of Johannesburg invites tenders for the supply of sanitary pails and lids (August 2nd), licence plates and badges (2nd August).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of 904,625 hardwood sleepers or (alternatively) creosoted Baltic sleepers (July 23).

The Chairman of the Union Tender Board, Box 371, Pretoria, invites tenders for the supply, delivery, and fixing in position where necessary, certain show cases, furniture and fittings, to the Public Museum at Bloemfontein (July 31).

The Corporation of Pietermaritzburg invites tenders for the supply of one steam turbine with tandem generators, switchboard. and condensing plant (July 29).

The Municipality of Ladismith, Cape Province, invites tenders for the supply of six inch steel pipes and other incidentals thereto for the proposed water scheme (July 15).

New Patents.

312. Alfred Argles.—Improvements in or relating to the recovery of gold, silver, and copper by amalgamation.
313. William Worthy.—An appliance for collecting the dust made when drilling with compressed air rock drills.
314. Sigismund Rudolph James Maynard.—Improvements in lubricators.
315. Robert Wilson.—Improvements in valves.
316. James Edward Anderson.—Improvements in steam superheaters.
317. Sidney Richmond Park.—Improvements in or relating to the handles of spades, shovels. forks, and like implements.
318. Ottokas Serpek and Societe Generale Des Nitrures.—Process for the manufacture of ammonia by means of aluminium nitride.
319. William Henry Stewart.—Cast metal dental plates for artificial teeth.
320. Heine Wolf Adler.—Improvements in devices for spraying mine workings.
321. Moritz Kahn.—Improvements in and relating to ferro concrete construction.
322. Frederich Walter Baynes and Malcomess & Co., Limited.—An improved stroke regulating device suitable for windmills, pumps and the like.
323. Antonio Soro.—Improvements in and relating to means for obtaining power.
324. Archibald Leitch Paxton.—New triplex wool press.
325. Guy Aubrey Chalkley.—Improvements in stretcher bars.
326. Walter Wentworth Prime and Stewart Charles Brown.—Improvements relating to wire netting and apparatus for making the same.
327. A. Lawrence Tighe.—Black peril protector magazine.
328. The Expanded Metal Co., Ltd., and Harry Salmon.—Improvements in the manufacture of expanded metal and in apparatus therefore.
329. Thomas Henry Chad.—A waterproof covering or coating for "cheesa" sticks for igniting fuses for blasting and other analogous purposes.
330. William Vogelgezang Hughes and Walter Edward Pitt.—Improvements in the making of shovels, spades, garden forks and the like.
331. Ernest Holroyd Martin.—Apparatus for feeding grinding bodies to tube mills.
332. Louis David Mills.—Improvements in precipitating metals from solutions.
333. Louis David Mills.—Improvements in precipitating apparatus.
334. Gogu Constantinescu.—Improvements in and relating to the automatic regulating of feed of liquids for supplying carburetters and for like purposes.
335. John Davidson.—The manufacture of an improved fish food preparation and apparatus for use therein.

INVESTORS' DIARY.

The following company meetings have been announced:—

July 19.—Transvaal Consolidated Lands.

July 26.—Booysens Estate; Middelvlei Estate.

Aug. 30.—Treasury Gold Mines; Wit. Deep; Crown Mines.

Sept. 4.—New Kleinfontein.

Sept. 21.—Wit. Deep.

Sept. 23.—Crown Mines.

Sept. 27.—Sub-Nigel; Simmer and Jack Prop.; New Kleinfontein.

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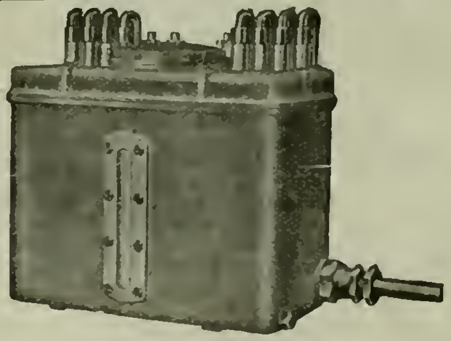

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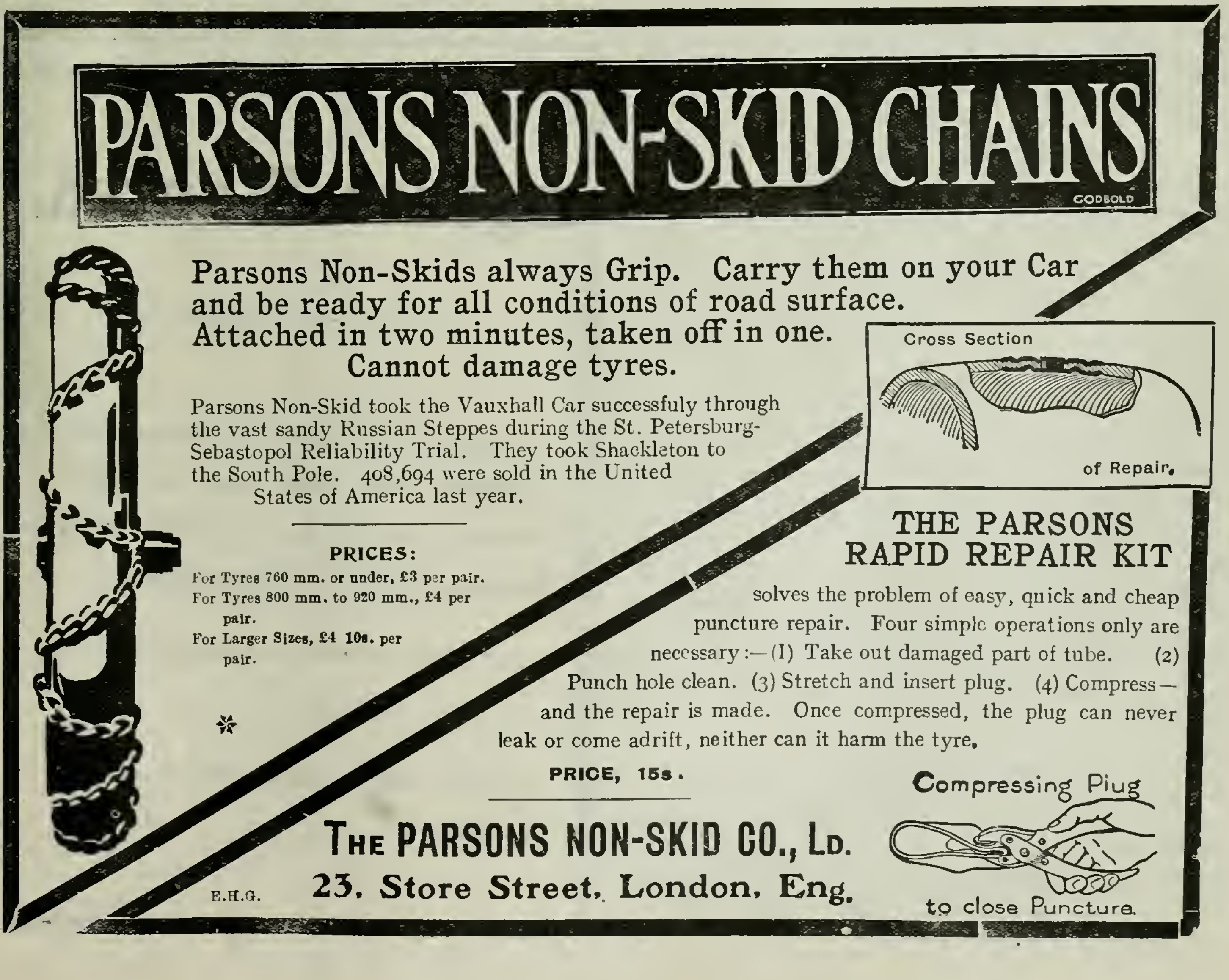
Automobile Notes.

Negligence and Street Accidents.

Last week reference was made to the negligence of the pedestrian, who, it was pointed out, figures so largely in the chapter of street accidents, in which automobiles are concerned. This fact, however, must not be so interpreted as to infer that the injured party is always at fault, and that drivers are freed from responsibility, for it will be found that a certain percentage, fortunately small, of motor accidents is directly attributable to incompetence on the part of the latter. Eventually this evil will be largely, if not altogether, obviated, with the licensing of all drivers of automobiles, provision to this end having been introduced at a recent session of the Legislature. Recklessness, on the part of drivers, is also responsible for some of the more serious accidents which occur, invariably in the form of furious and indiscriminate driving, which, to the credit of the more competent drivers, is seldom indulged in. The rashness of the practice, however, cannot be made too apparent. Accidents, briefly, may be described under three main heads: Negligence of the pedestrian, in the primary instance; secondly, incompetence, with regard to those in charge of automobiles; and, lastly, reckless speeding. Other responsible factors will be found to have a bearing, direct or otherwise, on the foregoing. Newspaper accounts of motor accidents, unnecessarily overdrawn, it may be mentioned, create erroneous impressions in the minds of the general public, and are to be discouraged. These exaggerated Press articles go far to explain the crusade against motors, waged by a section of the community, who come to regard all automobiles as exceedingly dangerous machines, many pedestrians in consequence becoming nervous and flustered, and such a condition naturally militates strongly against their personal safety when negotiating streets where motor traffic abounds. If the custom, more or less universally recognised, of extending or uplifting the arm, particularly at street intersections, to make clear any intention to stop or change direction, were more rigidly observed by Johannesburg motorists, a useful purpose would be fulfilled. As it is, an idea of indecision on the part of the driver of an automobile as to which course is being pursued, is often conveyed to the pedestrian, whose alarm is intensified by the neglect of the simple measure referred to. A regulation of this nature, if not already provided for, might be included with advantage in the by-laws relating to street control.

The Park Trophy.

The competition for the Park Trophy will be held on the 10th and 11th prox., on that section of the old Kimberley road, from Johannesburg to Potchefstroom, via Baragwanath, an untried route so far as automobile competitions are concerned. At the time of writing the rules and conditions of the race were not available, but will conform, in a great measure, to those governing this contest in previous years. A separate formula, it is expected, will be prepared for American cars, a procedure which, as in the case of the recent Reyersbach competition, will lend additional interest



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to the event. The determining factor in the Park trials is petrol consumption, and many readers, remembering the furore which the astounding results of last year's contest created, when a record was established, will anxiously await the official decision in the coming event.

The annual club dinner will be held on the evening of the 10th August at the rendezvous, the King's Hotel, Potchefstroom, the officially-appointed T.A.C. hotel at that place.

Tyre Questions.

Tyre manufacturers are keenly alive to the unique opportunity which South Africa affords in regard to testing their products, and it may therefore be accepted that any attempt to market this indispensable commodity—the tyre—is only made after due deliberation in point of the conditions, climatic and otherwise, obtaining. Tyres capable of withstanding the exceptional strain of South African roads—apart altogether from considerations of climate—are considered a rare asset of the motorist, and only a combination of the finest materials and workmanship can produce this desideratum. The criterion which usage on the high roads of older countries than this establishes is regarded from an entirely different standpoint when tyres are subjected to South African conditions. In short, tyre standards can only be determined by their users in the respective countries of operation. Many tyres, it may be remarked, have met with deserving success in this country, chiefly owing to the fact that manufacturers have made a special study of the peculiar requirements.

Motorists will be interested to learn that the Challenge Rubber Mills, a firm long identified with tyre manufacture, has appointed local agents for their several specialities. The reputation of the "Victor" tyre, one of this concern's products, has preceded it in this country, and in view of the convincing guarantee which accompanies each tyre, and with respect to the challenge this firm—the Challenge Rubber Mills—has given to the entire manufacturing world, South African motorists will probably be persuaded to give this new cover a trial.

The Road Question.

It is hoped that the present negotiations between the Government and the Transvaal Automobile Club, on the much vexed road question will be concluded in favour of all motorists. The Club, which, by the way, has been largely responsible for the gratifying action being taken by the Government in the Johannesburg—Coast road, consistently use their influence towards the betterment of the roadways of the country, and are deserving of a wider recognition and support than is the case. No individual organisation, however energetic, it is apparent, can effectively deal with a question of such magnitude as the road system presents, and more combined effort on the part of motorists in bringing into prominence the grievances which the existing state of the roads inflict can alone ensure the necessary attention from those responsible. Briefly, it may be stated that the varied interests of all motorists would be served were they to identify themselves in some form or other with the T.A.C., having respect to its influence as an organisation pledged to further and protect its members in the matter of legislation, and its readiness to extend every assistance to the good roads movement. Membership, in addition, qualifies for the many competitions held under the Club auspices, from which others are debarred in participating, and many other facilities of widely different natures are afforded.

Paraffin Carburettors.

The high prices obtaining for petrol have seriously turned the attention of the motor world to the latent possibilities of the paraffin carburettor, and the value of this adjunct fitted to the South African machines where the cost of motor spirit cannot be described as other than exorbitant, needs no enlarging upon. In support of the immense advance recently in the price of this commodity, it is explained that the demand for petrol has been increasing at an abnormal rate, whereas the demand for the residuary products in the shape of cruder forms of fuel has not kept pace. Petrol is the purest spirit obtained from the crude oil, and so long as there is a market for the residuary products it can be sold at a reasonable price. This market is evidently insufficient and the producers cannot afford to disregard what is not needed without compensating return. This they ensure against by an increase in the price of motor spirit. The remedy advanced is to develop the paraffin market, and hence the awakened interest in the advent of the paraffin carburettor. For commercial vehicles it is eminently adapted, ordinary paraffin being used with much success. The difficulty of smell from the exhaust would probably be regarded as a nuisance in regard to town work but would be of little consequence in the districts; some means, however, would be found to deal with the obnoxious smell, and so render the use of paraffin inoffensive. The motor movement has received its most serious check of recent years by the increased price of petrol, and a chance is now afforded the designer to market some efficient apparatus whereby heavy grade fuels can be used efficiently.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

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Notes and News.

The New President.

The election of Mr. M. G. Elkan on Thursday as President of the Chamber of Mines in succession to the late Mr. J. G. Hamilton has given general satisfaction. The position, of course, is the highest in the gift of the industry, and the Chamber is to be congratulated on having found in Mr. Elkan an able spokesman, experienced, tactful and familiar with the manifold problems of the Rand. We wish him a successful period of office.

* * * *

Miners' Contracts.

The last apparently has yet to be heard regarding the new miners' contract. Mr. Elkan, at the Chamber of Mines meeting on Thursday, made a passing reference to it. He dwelt on the fact that the agreement was only new in so far as it substituted a written for a verbal contract, and put in stores and unskilled labour at cost with a corresponding reduction in the price to be paid for the work done. The groups do not recognise intermediaries, but will discuss difficulties arising out of the new contract directly with the men.

* * * *

The Native Labour Position.

The native labour position is better than might be expected. The decrease shown last month is due principally to a large number of natives having taken their discharge; the wastage figure at this time of the year is always strongly influenced by local climatic conditions. During June rather severe weather was experienced, and therefore it is not surprising that the wastage figure for that month is high. Mr. Elkan pointed out on Thursday that, generally speaking, the position of native labour at the present moment was not—taking into consideration that we were now in the middle of winter—unsatisfactory, and as regards the recruiting returns received so far this month he was able to state that they show an increase—for the first seventeen days of June the figures were 9,028 natives, as against 9,748 for the corresponding period of July, thus showing an increase of 720. Judging from past experience, he thought they must expect a further reduction in the number of natives employed by the mines during this month. On the other hand, from the beginning of August the mines start receiving the first batches of new recruits from the latitudes north of 22 deg. South and as this class of labour has caused much comment, it is noteworthy that the mortality figures for June show an appreciable reduction on the preceding month. Everything is being done by the employers of tropical natives to reduce the rate of mortality further, the greatest care is being taken in all and every respect, and with satisfactory results.

* * * *

Nourse Mines.

The greatest handicap by which the Nourse Mines has been faced for a long while, in the effort to reduce working costs, is the enormous area covered by the mine workings and the faulted character of the reef. The latter feature is being obviated to a large extent by careful and well calculated preliminary development, and to meet the former difficulty a policy of concentration has been laid down and followed as closely as possible. In this connection the opening up of the western shaft of the South Nourse section has been of considerable value, but to complete the scheme outlined additional funds are necessary. In another part of this issue will be found a reference to the financial arrangements made for the purpose.

* * * *

Electric Furnace for Precipitate.

In view of the extent to which electric power is, and will be, available on the Rand, a paper by Mr. H. R. Conklin, of Lluvia de Oro Gold Mine, Chihuahua, on the adoption of the electric furnace for melting precipitate from the zinc boxes, and the smelting of concentrates, which appears in the last issue to hand of the *Engineering and Mining Journal*, is one that may be recommended for perusal by Rand metallurgists. The process appears to have been quite successful at Lluvia de Oro, and the author remarks that, as far as he is aware, it is the first and only electric furnace to melt precipitate and smelt gold and silver concentrate. There is no patent applied for, or intended, on any of the processes or improvements described.

* * * *

Another Cape Town Sensation. A discovery of gold is announced from Cape Town, and the discoverer, a Mr. Tearnan, who is said to have been a prospector in his younger days, and to have worked subsequently in the mines in the "north," is reported to have declared that "it ought to set Cape Town aflame." That statement, in itself, when considered in relation to what seems to have been actually discovered, stamps Mr. Tearnan as a person of a distinctly enthusiastic temperament. The geological details read strangely to a person accustomed to these matters, and when it is asserted that "Mr. Tearnan gauges the reef at thirty feet wide and a thousand feet long, with a downward tendency at first, running then on the level for a considerable distance," one feels somewhat dissatisfied with the mode of description. Mr. Tearnan preferred not to give the names of the analysts who pronounced his samples to be gold-bearing quartz, which is unsatisfactory from every point of view—so also is the apparent attempt to connect the age of the formation with the value of the reef, as if it had any bearing on the point. The frankly sceptical and non-committal attitude of the majority of the Cape Town public (*vide Star* telegram) is much to be commended.

* * * *

The Phthisis Act. The question of payments to the dependents of a miner, who, though not having lodged a claim with the Board, is proved to the satisfaction of the Board to have died of miners' phthisis, and to have been qualified to receive an award under this Act or under Act No. 34 of 1911, was discussed by Mr. Elkan on Thursday at the Chamber of Mines meeting. This provision he characterised as an entirely new departure from the original intention under the Bill presented by the Select Committee, which proposed that it should be laid down that examination of all applicants would have to be carried out by competent medical authorities appointed under the Act. He added: "I cannot help expressing my feeling that this alteration does not tend to improve the measure—on the contrary, the very foundation thereof has been shaken and the door has been opened to possible malpractices." Mr. Elkan's final word on the Act was: "The financial burden imposed on the mines is a very considerable one, but no doubt the controlling houses will make satisfactory arrangements to prevent the necessary moneys having to be provided by the mines during the next two or three years only. Some scheme will be devised by which the payments due from the mines will be spread over a lengthy period in order to interfere as little as possible with the ordinary dividend payments."

* * * *

Small Holdings for Miners. As promised by the Minister of Mines, a Commission has been appointed this week, in terms of the following resolution, accepted during the last session of the Union Parliament:—"That the Government be requested to consider the advisability of appointing a Commission to inquire into the possibility of utilising land in or near mining or industrial areas for purposes of settlement, more particularly in regard to the following questions:—(1) The extent to which such land would be taken up by those engaged in mining or industrial occupations. (2) The amount of land available for effective occupation. (3) The conditions under which it should be offered for allotment. (4) Legislative changes, if any, necessary to enable such a scheme to be carried out." The Commission will consist of five members, among them being:—Mr. Fleischer (Rand Townships Registrar), Mr. Van Niekerk (of the Eastern Districts Farmers' Association, Boksburg), Advocate Feetham, and Advocate Lucas. Dr. Macaulay, M.L.A., and Mr. Schumacher are to be congratulated on the success of their efforts to draw attention to this question.

Miners' Phthisis. In his annual report, Dr. Porter says: For recent findings in regard to this disease, reference is made to the reports of the Mining Regulations and the Miners' Phthisis Commissions. As regards the work of the former Commission, of which Dr. Porter was a member, the new regulations in regard to the hygiene of mining are cited. The Medical Officer of Health is particularly gratified to be able to state that practically all the Commission's recommendations, including those regarding dust-prevention, mine-ventilation, and air-standards, scavenging, water-supply, native diet, housing, first-aid and ambulance, were promulgated almost verbatim as regulations with the force of law, in *The Union Gazette Extraordinary* of November 21, 1911; the Commissioners believe if these regulations are enforced, they will place the hygiene of mining in South Africa on a higher plane than that of any other mining community of which they are aware.

* * * *

Natal Labour Organization. Draft proposals for the establishment of a Natal Labour Association were submitted and approved by the Durban Chamber of Commerce this week, and this, it was anticipated, Natal sugar, tea and coal interests would all join. It was pointed out that the natives were beginning to find that in the end they were better off on an estate in Natal than on the Rand. It is thought that with proper recruiting Natal should be able to obtain all the labour required at a cost below that now paid to Indians.

* * * *

Pneumonia on the Mines. Dealing with deaths in the Municipal area as the result of pneumonia, Dr. Porter finds that the Johannesburg figures contrasted for a period of years with those of "England and Wales" and London, show:—(1) That quite contrary to local medical opinion (which the Medical Officer of Health shared), there has been no material reduction of "white" mortality during the past seven years; and (2) that the crude white death-rate from pneumonia compares not unfavourably on the whole with that of "London." It must, however, be remembered that in Johannesburg the proportion of young adults is relatively large. Pneumonia mortality amongst S.A. coloured (chiefly mine boys) is, however, extremely high, and has been the subject of special investigation by Sir Almroth Wright, F.R.S., whose report is awaited with interest.

* * * *

Mr. Yule on Metallurgy. A large portion of Mr. Yule's presidential address at the annual meeting of the S.A. Institution of Engineers the other evening was taken up with a plea for rolls instead of Californian stamps for ore milling purposes on the Rand. Almost exactly twenty years ago the same plea was put forward by a writer in the columns of the *S.A. Mining Journal*. It has frequently been made since here and elsewhere, and it says much for the hold which the simple type of stamp has, for various reasons, on the mining engineer's estimation that it has been able to resist attempts to suppress it for at least the last quarter of a century. Whether the more recent view taken of its function in Rand metallurgy will be more effective remains to be seen.

* * * *

Derdepoort; There is very little information available for the public as to the actual condition of things at Derdepoort, as viewed by those directly interested in it and their professional advisers. A statement on these lines is expected at an early date, but the directors probably feel that it would be premature to attempt to say anything definite at present. The shares of the company have, nevertheless, appreciated considerably. There are very conflicting opinions expressed by diamond mining people with regard to a point brought up in our last issue, and; while one group maintain that all the rock spoken of as "blue" is true Kimberlite, another, and possibly more experienced, group assert that it is nothing of the kind. A microscopic investigation should leave little room for doubt, and one wonders why the question is left unsettled. It apparently makes all the difference between three or four dozen claims and, say, a thousand. Many engineers have been visiting the occurrence in the past few days. Geologists describe the occurrence as an "ultra basic segregation from an acidic volcanic breccia '—Apparently the rock will be harder than the hardest kimberlite, and the possibility of treating it at a profit depends on the return of stones. It is too soon to speak of the value of the find. Further to the north, Mr. W. E. Bleloch is opening up a similar deposit of even greater extent.

*   *   *   *

Option Arrangements.

There are in issue 2,000,000 10s. shares of an authorised 4,000,000 shares in the Oceana Consolidated Company, and this month, of the unissued 2,000,000 shares, 300,000 have been offered to shareholders for subscription at par, *pro rata*—one new in respect of each seven old. Nothing is said in the official notice about any arrangement having been entered into for the "guarantee" of the shares, but in the market it is understood that some guarantee arrangements have been entered into on the basis of options to underwriters. Such options are believed to be at varying prices and for varying periods ahead. It is further understood that those who have entered into the alleged option engagements bind themselves to "pool" the business. If there be any truth in the reports as to the arrangement understood to have been entered into, it would be interesting to know what the details are: to what extent options have been granted, if any, the prices, and the periods, if any agreed. In a frankly worded comment on the matter, the *Statist* says: When shareholders in companies that have granted undisclosed options notice that fresh shares are constantly being allotted (and "settled" under the rules of the Stock Exchange) they feel they have been exploited. "Guarantors," apparently in several directions, have at very little risk indeed secured options. In the case of public issues in the same manner as that now noticeable in respect of the Oceana Consolidated Company, options would appear to have been granted on a very much larger number of shares than those initially offered to shareholders, and of which shareholders loyally took up their quota of shares offered them, and sometimes more. Possibly "guarantors" have not had to put their hands in their pockets for one single farthing of capital, and secure options (which really cost them nothing) over a long period on conditions that may afford them, the "guarantors," substantial profit. The subject of undisclosed options is one that calls for investigation; in some directions it is considered a growing scandal.

*   *   *   *

Fighting Malaria and the Mosquito.

The annual report of the South African Anti-Malarial Association, for the twelve months ended March 31st last, has been issued. The scope of the organisation's work has been extended so as to embrace all areas in British South Africa in which malaria is endemic, or in which it breaks out from time to time. It is the latter class of district in which the greatest difficulties are encountered in the crusade against the disease, for it is usually the case that where the scourge is endemic, greater care is exercised in the application of the precautionary measures advocated by experts. The Association has done good work in the circulation of literature designed to educate the public as to the means whereby the mosquitoes which carry the disease may be exterminated and prevented from breeding. In many of the schools of the country, the work of inculcating knowledge as to the carriers of the disease is being proceeded with. The influence of the mosquito is not so much to be found in the mortality returns as in the reduced standard of the general health of a community. An especially interesting feature of the Association's report is the statement made as to forthcoming experiments to introduce larvae-eaters.

*   *   *   *

Eye Disease of Coal Miners.

What is described as an isolated case of nystagmus, a disease of the eye that is fairly rife among coal miners of England, has occurred in New South Wales, and the attention of the Minister of Mines of that State has been attracted to it because of the fact that the sufferer has been endeavouring to get the disease treated as an accident under the Miners' Relief Fund, with a view to obtaining compensation. But it was found impossible to extend the provisions of the fund in the direction aimed at. The actual cause of the trouble appears to be that the miner is compelled to work with his body in a constrained position with his eyes turned upwards or sideways for long periods in the very dim light given off by safety lamps. According to a leading surgeon in Sydney, the men working coal-cutting machines seldom, if ever, get the complaint; but this is due to the fact that they are not compelled to work with their bodies twisted or cramped up in an unnatural position. The disease makes its presence felt gradually. The first few attacks last some hours, or, as it advances, a day or two, and ceases when the miner knocks off work, but if he continues to work in the mines the attacks occur more frequently and last longer, and the condition becomes permanent. No treatment has been found so far to be of any avail except complete abstinence from work in coal mines. The disease, it appears, is common enough in English coal mines, and there have been theses on the subject in the *British Medical Journal*. Mr. Edden, Minister of Mines of New South Wales, claims that until safety lamps were introduced into the coal mines of the State the complaint was unknown, but agrees that the trouble arises equally from the constrained position which the men are frequently forced to adopt when at work and from the bad light of the safety lamp. Officials of the New South Wales Mines Department affirm that there is little likelihood of the complaint spreading in the coal-mining districts of the State, as the working conditions are altogether different from, and more favourable than those obtaining in English coal-mining districts.

*   *   *   *

Artificial Gold.

The disclaimer recently issued by Sir William Ramsay, in which he definitely contradicts the rumour that he has reported favourably on a process for manufacturing gold, shows that speculators are already taking advantage of the fact that modern scientific opinion regards the transmutation of metals as an open possibility. The gradual disappearance of scepticism in this matter was explained to a representative of the London *Standard* by an eminent scientist, as follows:—The absurdity of a transmutation of metals was adopted as a scientific dogma in the eighteenth century, but since 1869 certain things that have been discovered have shown that the dogma was premature, just as it would still be premature to say that transmutation will ultimately be achieved. In 1869 the Russian chemist Mendeléeff arranged the elements in the order of their atomic weight, and from this arrangement conceived the hypothesis that they had all been evolved from some common original substance. For the elements thus arranged fell into families, each member having similar but accentuated properties as the atomic weight increased, and therefore the old idea that the simple elementary substances stood absolutely apart one from another had to be abandoned. The hypothesis that an unknown substance or element, provisionally called "protyle," underlies their difference was suggested to account for the affinities. Now this was a considerable revolution in opinion. However, I think one may say that scientists still maintain the improbability of this achievement, although the state of scientific knowledge as it stands at the moment seems to oppose no insuperable barrier to it. But one may speculate whether a universal method of transmutation would be discovered. It appears to me that we shall conceivably be able to note affinities between certain elements, and even to transform one into another. But the idea that gold will be the first artificial element to be constructed is probably a delusion, even if it is not a fraudulent delusion. A universal process of transmutation would throw our whole economic life into the most extraordinary quandary, and the difficulties created by the discovery of a way to make gold artificially would alone be very disastrous. But the other minor transmutations, not bearing so directly upon our standard of values, might be scientific benefits without becoming the basis of too profitable exploitations.

TOPICS OF THE WEEK.

THE MINISTER OF MINES AND THE INDUSTRY.

The sojourn of the Minister of Mines on the Rand is being attended by the happiest results. It opened officially under the most favourable of auspices last Saturday night at the Government Miners' Training School at the Wolhuter, where Mr. Malan made a speech marked by dignity, sympathy and understanding. During the week Mr. Malan has visited several of the leading mines, notably the Village Deep, the Randfontein Central and the West Rand Consolidated, and from every quarter come expressions of satisfaction at the interest shown by the Minister in the problems of the industry. Mr. Malan's speech at the Miners' School on Saturday revealed an admirable grip of the outstanding questions affecting living conditions on the mines. We print a full report of the speech elsewhere, and commend it as a thoughtful and fairly accurate *resumé* of the position as regards accidents, phthisis and the housing question. If under the first head, Mr. Malan inclined too much to the strictly official view, he amply made up for it by a generous appreciation of the pet scheme of Mr. R. W. Schumacher and Dr. Donald Macaulay. We are glad to know also that the Minister appreciates our own modest efforts in the same direction, and he may rest assured that his anxiety to improve conditons on the mines is shared by the Press of the Rand. At the Chamber of Mines meeting on Thursday, Mr. Malan's advent was welcomed in felicitous terms by the new President, Mr. M. G. Elkan, and by Mr. Schumacher. The incident is unique in the annals of the place, and the significant words of these spokesmen of the industry must be placed on record. Mr. Elkan spoke with his wonted tact and thanked the Minister for having taken such an early opportunity of making himself personally acquainted with local mining conditons. "I have been able to assure the Minister," he added, "that it is the ardent wish of the Chamber to work at all times in absolute harmony with the Government and the Mines Department, and I feel certain that Mr. Malan's visit to the Witwatersrand and his investigations—whether they appertain to the mines or to those employed on them—will go a long way towards facilitating matters in the future. I am sure that, from what the Minister is now seeing of our mining operations—and let me tell you that he is most painstaking in making himself acquainted with the mines of the various districts—he will be convinced that those responsible for the management thereof are fully alive to the obligations imposed on them, and that they are not sparing any trouble or expense in making the conditions on the mines, whether on the surface or underground, as perfect as they can be made." Mr. Schumacher followed with a tribute to the earnest manner in which the Minister had been studying important questions on the spot, and his evident deep sense of responsibility, which would, he was sure, win for him the good wishes of all connected with the gold mining industry, both workers and employees. Mr. Schumacher added: "A sympathetic attitude on the part of the Minister of Mines will do a great deal to dispel the undoubted anxiety which was recently raised in the minds of financiers, bankers and investors in Europe by certain legislative proposals in the Cape House. I would like to take this opportunity to say also that it would be a very desirable thing if other leading gentlemen, leading politicians on both sides of the House, would follow Mr. Malan's example and come here and study the conditions that prevail. We have nothing to hide. We have nothing secret. We are prepared to show everything and we shall be only too pleased—I am sure you will all agree with me—to extend whatever hospitality we can to all who come; and to those who have attacked us—I think in ignorance—most bitterly, we shall be most pleased to afford every opportunity to see men and mines, and to see how things really are in order that they may, as we believe, become converted. We want these people, if they wish to criticise us, to criticise us with knowledge and not in ignorance. We want them, when they legislate for us, to legislate with knowledge. It will be better for us; it will be better for them; and it will be better for this country." These wise and tactful words will, we trust, allay the fears of investors regarding the policy of the Government and imbue the latter with an increased desire to merit the confidence which shareholders and mine directors have in the past—not without reason, it must be admitted—shown a disposition to withhold. Mr. Malan's visit has begun well and has already borne good fruit.

DISEASE ON RAND MINES.

Questions of health and disease on the mines of the Rand have bulked largely in the public eye during the past few days. The speech of the Minister of Mines, the annual report of Dr. Porter, the Medical Officer of Health for Johannesburg, and the letter from Mr. Samuel Evans appearing in another part of this issue—all combine to call attention to the enormous money value of improving hygiene on the mines. Phthisis has been so thoroughly discussed of late that it is unnecessary for us to return to it at this moment. To pneumonia, enteric, and to contagious diseases, however, all too little attention is paid, and there are not wanting outspoken critics of our mine doctors, who lay the blame for the high rate of native mortality here on the hide-bound conservatism of our medical men. The inevitable reply that such criticism comes from laymen is discounted by the fact that in America it took a layman, Professor Irving Fisher—a political economist—to wake up public and medical opinion to the enormous national and economic importance of conserving the health and vitality of the people. Here, on the Rand, Mr. Samuel Evans, Chairman of the Crown Mines, has been foremost in pointing out the significance of the lessons we can learn from the sanitary revolution effected in Cuba and Panama by the American Government. The facts given in Mr. Evans' letter cannot be too closely studied on the Rand—but, unfortunately, the people whom they should concern most, our medical men, still appear blind to their significance. Perhaps a few lines from the introduction to Professor Fisher's celebrated work on National Vitality may advantageously be quoted here. "The problem of conserving natural resources," says that authority, "is only one part of the larger problem of conserving national efficiency. The other part relates to the vitality of our population. The two parts are closely interwoven. Protection against mining accidents, forest fires, floods, or pollution of streams prevents not only loss of property, but loss of life. The prevention of disease, on the other hand, increases economic productivity. So far as we can compare vital and physical assets as measured by earning power, the vital assets are three to five times the physical. The facts show that there is as great room for improvement in our vital resources as in our lands, waters, minerals, and forests. This improvement is possible in respect both to the length of life and to freedom from disease during life. There is no need, however, of waiting for a century for this increase. It could be obtained within a generation. Three-fourths of tuberculosis, from which 150,000 Americans die annually, could be avoided. Eighteen experts in various diseases, as well as vital statisticians, have contributed data on the ratio of preventability of the ninety different causes of death into which mortality may be classified. From these data it is found that fifteen years at least could be at once added to the average "human" lifetime by applying the science of preventing disease. More than half of this additional life would come from the prevention of tuberculosis, typhoid, five other diseases, the prevention of which could be accomplished by pure air, water and milk. In Lawrence, Mass., after the installation of a pure water supply, the death-rate from typhoid was reduced by 80 per cent. For every death thus saved from typhoid, two or three deaths are saved from other diseases. Judging from the English statistics of illness, we must conclude that at all times in the United States about 3,000,000 persons are seriously ill, of whom about 500,000 are consumptives. Fully half of this illness is preventible. If we appraise each life lost at only $1,700 and each year's average earnings for adults at only $700, the economic gain to be obtained from preventing preventible disease, measured in dollars, exceeds one and a half millions. This gain, or the lengthening and strengthening of life which it measures, can be secured through medical investigation and practice, school and factory hygiene, restriction of labour of women and children, the education of the public in both public and private hygiene, and through improving the efficiency of our municipal, State, and national health service. Our national government has now several bureaux exercising health functions, which only need to be concentrated under one department to become co-ordinated parts of a greater health service worthy of the nation." The application of all this to the Rand is plain. Perhaps, however, it is premature to discuss details of preventive measures until we have Sir Ahnroth Wright's report. In the meantime, however, there seems to be no reason why measures should not be taken from end to end of the Reef to exterminate the common germ-carrying fly from the native compounds. By a coincidence the mail brings particulars of a campaign which English papers, following American example, are now instituting against the fly. It is pointed out that it is now an established fact that the house fly is the filthiest of all insects. Wherever it goes it carries disease. Medical officers of health and men of science agree emphatically that no mercy must be shown. Bad meat kills hundreds, bad water thousands, but flies are responsible for the death of hundreds of thousands of human beings in all parts of the world. Numerous cases of typhoid fever are caused by flies. They are more to be feared than the mosquito; indeed, modern knowledge goes to prove that they may be classed the world over as the most dangerous animal on earth. The old fancy that in killing flies we are destroying useful scavengers has no foundation in fact. Flies must be killed; here, briefly set forth, are the chief reasons which render their wholesale destruction imperative. The fly breeds in filth of all kinds. A single fly lays about 100 eggs at a time; it may be succeeded by twelve generations; the total possible progeny of one fly during one season amounts to the staggering total of 1,096,181,249,310,720,000 millions. The unchecked development of one fly through twelve generations—each female fly usually lays four batches of eggs—would make a mass of flies considerably larger than the total mass of the earth. The fly first takes disease germs into its digestive system, entangles them on its feet, wings, and body; then it flies to your house. The chief danger comes from the germs of summer diseases carried by the fly. It may also convey the germs of typhoid, diphtheria, dysentery, consumption, ophthalmia, plague, smallpox and anthrax. Six million six hundred thousand germs have been found on a single fly. An examination of four hundred and fourteen flies resulted in an average of one million, two hundred and twenty-two thousand, five hundred and seventy germs each. In one case a fly was allowed to walk about in a culture of typhoid germs, and then transferred to a gelatine plate. In the trail left by that fly there were thirty thousand bacteria—and a few will cause death. It is noteworthy that the Right Hon. John Burns, M.P., President of the Local Government Board, writes "that the question of flies as carriers of disease is one on which he has authorised the expenditure of public money in scientific investigations. His view is, of course, that a crusade against flies is desirable." Professor Robert Newstead, M.Sc., A.L.S., Professor of Entomology at the Liverpool Tropical School of Medicine, writes: "I most thoroughly approve of any efforts that may be taken for the destruction of the housefly, as I have for several years past realised that this insect is one of the greatest disseminaters of disease in man in this country." Let us hope our doctors will be forced by the pressure of public opinion to study and apply these lessons of preventive medicine that now pour in on us from all quarters.

THE NATIVE LABOUR ORGANISATION SCHEME.

Our announcement of the formation of a central native labour recruiting organization for the Rand was confirmed by Mr. M. G. Elkan at the Chamber of Mines meeting on Thursday. Mr. Elkan spoke hopefully of all the groups—*i.e.*, including the Robinson and Premier—coming in; and in the general interest it is to be desired that his hopes will be fulfilled. The daily papers, which only a few days ago woke up to the significance of our announcement made a fortnight ago, have added that Messrs. Jenner of Neumanns and Palmer of Barnatos will assist Mr. Taberer in the new organization. The guess, we believe, is wrong in both cases —Mr. Jenner is remaining in charge of all the compounds on the Neumann group, and Mr. Palmer, on his return from his holiday, is betaking himself to the congenial business of farming. Mr. Elkan laid stress on the fact that the negotiations had been very protracted owing to the great difficulties which presented themselves, and it was only due to a policy of give-and-take from all sides that it had eventually been found possible to come to an agreement. He mentioned that while the basic principles of the agreement have been settled, there remains a mass of work to be done in working out the details to set the new organization going, and this will take some little time to accomplish. It is intended that the new organization shall take effect as from the 1st October next—a delay, it will be noticed, of two months on our forecast. Mr. Elkan wisely refrained from giving figures in regard to the saving to the industry, which may result from this consolidation of the various recruiting organizations, but he submitted the following to the meeting: During 1911, the Witwatersrand Native Labour Association recruited nearly sixty thousand natives at a cost to the employer—including the expense of bringing natives here of about threepence per shift worked. Against this, the independent recruiting organizations which are now about to combine recruited during the same period some eighty thousand natives at an average cost of sevenpence per shift worked. From a comparison of these figures one can see the great scope there is for effecting savings. Moreover, while the East Coast native, who costs only threepence per shift, works about four hundred shifts before returning home, the much more expensive native from the territories within the Union works less than two hundred and fifty shifts. "I need hardly add," said Mr. Elkan, "that such savings will not be effected within a day or a month, but that they will be brought about cannot be gainsaid. There will, however, be one immediate result, and that one is of the greatest importance. The combination agreed on will bring about the immediate cessation of any further increase in the cost of labour. Putting aside the monetary question, there are other advantages—advantages which weigh very considerably with all who take an interest in South Africa. The very keen competition for this class of labour which has been carried on in the past has had a very demoralising effect on the native. He was being run after by dozens of recruiters, and I am afraid that a good many evil practices were resorted to in order to secure his services. This will cease in future; there will no longer exist this cut-throat competition, and in due course this is bound to have a beneficial influence on the native's mind." These considerations compel us to regard the new agreement as a matter upon which not only the industry but the whole country is to be congratulated.

PROGRESS ON THE TIN FIELDS.

The Ubiquitous Nigerian Waterberg Tins—The Doornkom Neighbourhood Attracting the Gold Fields—Sinking in Progress at Groenvlei.

RECENT reports from the tin fields are to the effect that Mr. Pat Boyle, who is associated with the Nigerian and Waterberg Tin Company, has been taking up large claim areas, presumably on behalf of the company. The farm Leyden, north-west of Eckstein, and south-west of Klipplaatdrift, is, among other farms, mentioned in connection with this claim-acquiring enterprise. Other claims are said to lie on Mozambique, that is in close proximity to the diabase occurrences, if not actually upon them. It is not improbable that traces of tin may be found anywhere in the red granite, even at the outer edge, in the region of the basic rocks. Experience appears to be against the chances of discovering payable ore in considerable quantities in the lower horizons of a granite batholith, and in this connection we may again draw attention to some remarks upon the subject by Messrs. Ferguson and Bateman, in Vol. VII., No. 3, of "Economic Geology," which were quoted in the *S.A. Mining Journal* a few weeks ago. The fact that granite is exposed at the surface is no evidence that it is a portion of the upper stratum of a batholith, and there is, at any rate, sufficient evidence to justify the assumption that the red granite areas on the eastern edge of the Potgietersrust belt comprise what has been left in the lowest horizons after a very extensive if not complete removal of what was once the upper portion of the mass.

Fortunately, over wide stretches of country in the Waterberg the higher horizons, and, indeed, the actual surface of the red granite batholith are to be met with, either exposed or in contact with overlying formations.

Things are said to be looking up at Groenfontein, where some useful pipes have been located lately, and where the prospects of the Government lease ground are considered quite promising.

The Consolidated Gold Fields are reported to have taken an interest in ground immediately adjacent to Doornkom, and to be engaged in prospecting operations there.

Appingendam appears to be suffering from neglect at the moment, in spite of the attentions of the German financiers who are supposed to be considering a large block of claims upon the farm; those owned by the Transvaal Bay Tree Tins. Another large block, quite adjacent to the latter area, is alleged to have been offered to Mr. Pat Boyle, whose efforts on behalf of the Nigerian and Waterberg Tin Company are apparently meeting with an enthusiastic response.

At Groenvlei sinking in the main shaft has reached the depth of 300 feet, and a crosscut is being driven at that level to intersect other bodies supposed to be in the neighbourhood.

BOREHOLE SECTIONS IN ZUURBEKOM.

A Vast Reservoir of Excellent Water—The Rand Water Board Still Opening Up—An Increased Supply Anticipated.

THE farm Zuurbekom is well known as a locality whence the Rand Water Board derive a large proportion of their water supply, and work is now in progress there which promises to result in a vastly increased flow. Mr. David Draper, who first of all drew attention to the value of the formation on this farm as a practically inexhaustible reservoir, gave some interesting information at the last meeting of the Geological Society with regard to the strata penetrated by various boreholes, the data of which are now published for the first time. His paper is given more or less in full here:—During the latter part of the year 1891 and the first half of the following year a series of boreholes were put down by the Great Western Coal Prospecting Syndicate, on the farm Zuurbekom. No plan showing the position of the holes is in existence at present, but from memory I have located them approximately on the plan accompanying this paper. The following sections have been recently obtained from Mr. H. Michaelis, who was the chairman of the syndicate, and he has kindly given me permission to place them on record in the transactions of this Society. My reason principally for wishing these sections to be recorded is that the Geological Survey has recently issued a map of the Klipriver valley, in which the entire farm Zuurbekom is shown as consisting of dolomite and schist. With the knowledge of the boreholes put down in 1891-5 in my possession, I always maintained that the greater portion of the farm was underlaid by coal measure, sandstone and shale, and that this accounted for the softness of the water, as compared with the supply drawn from a purely dolomite area. Unfortunately, in all my previous reports on this area, I had only my memory to fall back upon. My original report had been mislaid and in all probability accidently destroyed. Now that the records of the boreholes, as given by the man in charge of the drill, have come to light, I am in a position to state the exact depth and the strata passed through in each of the five boreholes, and they are as follows:—Borehole No. 1: Loose ground and boulders and clay, 65ft. 3in.; soft sandstone, 42ft. 0in.; black shale, 7ft. 9in.; hard sandstone, 53ft. 1in.: total, 168ft. 1in. Borehole No. 2 (100 yards east of pan): Clay and boulders, 43ft. 0in.; soft sandstone, 26ft. 9in.; shale, 3ft. 0in.: hard sandstone, 93ft.; total, 165ft. 9in. Borehole No. 3: Clay and boulders, 58ft. 6in.; soft sandstone, 48ft. 3in.; shale, 11ft. 0in.; coal (6in. recovered), 3ft. 0in.; shale, 11ft. 9in.; coal (10in. recovered), 3ft. 0in.; shale, 11ft. 6in.: coal (1in. recovered), 3ft. 0in.; shale, 5ft. 6in.; soft sandstone, 5ft. 9in.; mixed shale and sandstone, 25ft. 9in.; shale, 3ft. 0in.; sandstone (very soft), 4ft. 6in.; clay, 5ft. 0in.; dwyka conglomerate, 18ft. 5in.; total, 220ft. 11in. Borehole No. 4 (total, 363ft., of which the following details are given): Clay, 60ft. 0in. pot clay with pebble, 42ft. 0in.: soft sandstone, 10ft. 0in.; shale, 16ft. 0in.; coal, 0ft. 10in.: shale., 1ft. 0in.; coal, 0ft. 6in.; soft sandstone, 65ft. 0in.; soft shale, 8ft. 0in.: limestone and sand, 18ft. 0in.; sandstone and shale mixed, 40ft. 0in.; soft limestone, 15ft. 0in.; sandstone, 20ft. 0in.; no details, 34ft. 0in.: total, 363ft. 4in. From the foregoing section it will be seen that a basin existed in the dolomite, which was filled in with coal measure sandstone, shale and several inferior beds of coal. The greatest depth of this basin, as shown by borehole No. 4, was not less than 329ft. below the present surface. Only one hole, No. 3. 220ft. deep, encountered dwyka conglomerate; the other boreholes were discontinued while still in sandstone and shale. There does not appear to be any connection between the coal area in Zuurbekom and that on the adjoining farm Syferfontein, as there is a distinct ridge of dolomite and schist outcropping on the mutual boundary of these farms. At present a hole is being sunk near the site of No. 2 borehole, but up to the date of my visit last week, only surface soil and clay with schist boulders have been encountered to the depth of about 80ft. though a considerable quantity of water was being pumped from this shaft. In all the boreholes and shafts previously put down on this farm, schist boulders were found in surface soil and clay, and these have no doubt been derived from the higher lying dolomite which at one time completely encircles the coal measures.

THE FUTURE OF THE BANKET SERIES.

No Chance of Further Main Reef Discoveries—The Venterskroon Area—N'Kandhla and Rand Mining Houses.

[By David Draper, F.G.S.]

So far, only two contributions have appeared in the *South African Mining Journal*, criticising my views on the future of the Banket series in the Transvaal, which appeared in the number published on the 4th May. Knowing that I was only stating publicly what most geologists have long privately believed, I did not expect a strong opposition. That published on June 1st appears to have been conceived in the *S.A. Mining Journal* office, and the author admits my contention by his inability to prove that there is a single company at work outside the area which was pegged in the first couple of years after the Rand was discovered. Occasional patches of rich ore, such as that in Waites' claims on Witpoortje, have been discovered from time to time, but they have invariably petered out, and consequently they cannot be considered as evidence contradictory to my views. For all I know to the contrary, Waites' claims may be an exception to the general rule, but I have not heard of any machinery being erected to work them, so I presume they have also failed. Nor do I see how "it will be admitted that a good deal depends upon the sources from which the gold has been derived." How will it help those companies, which are not turning out sufficient gold to pay their way, when they are let into the secret of the source from which the gold has been derived? Will their gold returns increase when they discover that the valuable metal they are seeking was put into the conglomerates by any particular process? And how will it help the prospector to find payable reefs? So far as our knowledge of diabase dykes is concerned, it is admitted that they neither cause any metamorphosis of the rocks through which they have found their way, nor do they bring about any enrichment of the conglomerates, at the points of intersection, so they may be discarded as a probable source of the origin of the gold, notwithstanding Mr. Baring Horwood's discovery of iridosmine, both in the Rietfontein reef and in the great dyke which cuts it off from the lower Witwatersrand beds. But Mr. Hallimond's statement as quoted in this contribution, "The geologists have gone over it (the Venterskroon area) time and again, and there cannot be two opinions, in the face of the evidence that exists, about its being the Witwatersrand series, but how many geologists have attempted in a proper manner to find a payable reef?" is one to which I must take exception.

Mr. Hallimond's Views.

Does Mr. Hallimond wish us to understand that all previous geological investigators have simply walked over the ground, and never attempted to discover any payable reefs? If so, I may tell him that in 1888-9 Mr. Tudor Trevor, the late Mr. H. Robinson, Mining Commissioner, and myself, spent many months in this district, and we endeavoured by every means in our power, including the expenditure of large sums of money, to discover something payable, but we utterly failed. Then again, do the years spent by the late Mr. H. Bunkell, and by Dr. Hatch, in prospecting the farms held by Messrs. Lewis & Marks count for nothing? Since the war the Orangia Main Reef Company exhausted nearly all their working capital in prospecting their farms on the Kromellenboog spruit, and they were assisted by the best geological advisers, Dr. Molengraaff, Mr. E. Frames, and others, and what did they find? Nothing. Later on Dr. Corstorphine supervised prospecting operations on this ground, and he was assisted by Mr. F. W. Penney, F.G.S., who for six months guided the workmen in their search for a payable reef, but nothing was found. So I can only suppose that Mr. Hallimond was ignorant of the past history of the Venterskroon area when he penned these lines.

The next contribution is signed "Ego," and his principal contention appears to be that the N'Kandhla bankets were abandoned because "it has been said that the firm (a well-known Rand financial house) in question spent from ten to twenty thousand pounds in Zululand at that time, and it was worth it. Perhaps so. The principal explosive in use by the prospectors was 'Club Whisky,' the supply of which was not equal to the demand for it. . . . It is the only exploration by the 'Groups' that we have experienced in the past. Rightly or wrongly, they have branded the Insuze Banket series as worthless." This is the way those cheerful outside prospectors have of proving the value of these reefs. "Damn the Rand financiers" is their motto, but even this method will not make six pennyweights over fifteen inches pay, even if it is called "the South Reef." Perhaps it will be news to "Ego" that the gentleman sent down to superintend the work undertaken by the Rand financial houses was one of the ablest men in his business, and holds a high position in the leading Rand mining house to-day, and they did not place him in his present responsible position because he spent the company's money on "Club Whisky."

N'Kandhla Turned Down.

Some years ago I investigated some claims on the N'Kandhla fields, though I did not go over a large area, nor do I personally know much about the country. I turned down those claims because I could not see how they could be made to pay even working expenses. Perhaps "Ego" has made some new discoveries. I hope so. But all his statements so far seem to me to emanate from one who does not know much about mining, and far less about the policy of the Rand financial groups; and I may tell him here, though I hold no brief for any house in South Africa, that there is no financier so insane as to decline to develop a property that offers a fair chance for a good return on his capital. They are searching all the continents of the globe for good mines, and why should they refuse to develop the Zululand reefs, which are so near their headquarters? Until the company, which friend "Ego" is advertising, has paid a dividend for gold won, I see no reason why I should alter my opinion on the value of the Banket series, outside of the Witwatersrand.

Analysing Coal and Coke.

The U.S.A. Bureau of Mines has received many requests for information relative to the methods in use at its laboratories for analysing coal and coke, and determining the heating value of these fuels. The fuel investigations now being conducted by the Bureau of Mines had their inception in the work undertaken at the Government coal-testing plant erected in 1904, at the Louisiana Purchase Exposition, in St. Louis, and the coal-analysis methods used by the Bureau of Mines are essentially those that were originally adopted by the chemists of the coal-testing plant, and were followed in the subsequent chemical work of the Government fuel-testing plants at St. Louis, Mo., Norfolk, Va., and Pittsburgh, Pa. A report, now issued, describes the original methods (which were those recommended by the Committee on Coal Analysis of the American Chemical Society) and such modification and changes as experience has shown advisable.

THE PROGRESS OF WORKING COSTS AND PROFITS.

An Analysis of Recent Rand Tendencies as Reflected in Figures.

The importance of the native labour factor in its direct relation to the condition of working costs and profits is so well understood that it is unnecessary to enter into a discussion of the subject. One would naturally expect to see the influence of a decreased native complement strikingly demonstrated in the statistics published by the Mines Department and the Chamber of Mines. The following figures have been taken from the records of the Chamber of Mines, and the one thing that will be particularly remarked about them is their failure to show anything of the kind. At the beginning of the year there were employed by the producing mines some 183,268 natives; in November the number had decreased to 176,736, but, instead of the tons milled decreasing in similar ratio, the quantity recorded, 2,089,387 tons, was actually greater than in any other month of the year. Recovery had fallen, of course, but it must be remembered that there was a reserve of perhaps between 60,000 and 70,000 ounces in hand, so that altogether it it probable that there was a comparatively insignificant falling off under this head. Working costs were slightly higher, to the extent of about fourpence per ton.

It is clear that no effort was spared to keep the mills going, and a reference to the Mines Department statistics shows that development suffered to some extent in the process. Much assistance was obtained from rock drills, however, which had increased since the beginning of the year by nearly one thousand machines:—

1911.	Natives. Gold Mines.	Tons Milled.	Revenue per ton milled. s.	d.	Working Costs per ton milled. s.	d.
January	183,268	1,855,232	28	0	17	11
February	189,434	1,712,198	28	6	18	3
March	193,457	1,960,678	27	7	17	11
April	194,328	1,926,583	27	7	17	7
May	190,392	2,002,926	27	6	17	10
June	186,940	1,986,559	27	6	17	11
July	181,582	2,095,220	27	2	17	10
August	179,810	2,107,809	26	8	17	9
Sept.	179,619	2,037,329	27	4	18	1
October	179,194	2,083,900	27	0	18	0
Nov.	176,736	2,089,387	27	6	18	3
Dec.	178,282	2,030,437	27	10	18	5

The sum total of the conclusions which may be arrived at without any very profound consideration of this tabular statement is that although labour was ebbing away from day to day the all-important matter was the keeping of the full complement of stamps going with an increasing duty. The average sorting in January was 13·53 per cent.; in November, 12·55 per cent., so that the quantity of waste going to the batteries as a result of the use of extra machines and the general policy of "hustle" was not so well dealt with as it would have been under more favourable circumstances. It is not too much to assume that while the tonnage was greater in November than in any previous month, the percentage of waste, apart from the lower degree of sorting, was greater than usual. The maintenance of the recovery grade at within a few pence of the January declaration, and the existence of a heavy gold reserve, can only be explained upon the assumption that some of the payable ore stoped was of somewhat higher value than usual. It was higher, evidently, than for several previous months. When mills are in full swing, when development is of necessity somewhat neglected, and when grade is maintained in the face of decreased sorting and in spite of the greater supply of waste from machine-worked stopes, it may justly be said that things are undoubtedly out of balance.

LABOUR REQUIREMENTS OF THE RAND.

At the end of December, 1911, it was recorded by the Chamber of Mines that about 1,200 stamps were erected but not working. The total number at work was 9,565, so that, roughly speaking, there was about 12 per cent. of the stamping capacity unavailable for want, mainly, of the necessary labour. The following tabular statement shows the extent to which the labour complement was short of the required number of boys at about the same period. It is taken from the annual report of the Witwatersrand Native Labour Association:—

Groups.	Complement.	Natives employed at Dec. 31, 1911. By Company.	By Contractors.	Total.	Percentage of Complement
Cons. Gold Fields..	33,115	15,837	1,305	17,142	51·77
Cons. Investment .	21,133	12,204	1,881	14,085	66·65
Eckstein & Co. ...	37,023	21,149	1,132	22,281	60·18
Farrar—Anglo-F. ..	26,283	19,803	486	20,289	77·19
General Mining. ...	22,076	14,249	546	14,795	67·01
Goerz & Co.	10,295	6,369	275	6,644	64·54
Neumann & Co. ...	17,001	11,007	493	11,590	68·17
Rand Mines	48,544	30,424	1,172	31,596	65·09
J. B. Robinson ...	36,858	14,565	13,030	27,995	75·95
	252,328	145,697	20,720	166,417	65·95

It will be seen that only 65·95 per cent. of the labour actually considered necessary by the various mining companies was available at the end of the year. It seems obvious that the balance of 34·05 per cent. was not all urgently needed for stoping purposes, and the conclusion to be drawn is that the requirements of development constituted the principal and most pressing source of demand. The demand for labour may become less to some extent as mechanical appliances come more into vogue, but the tendency at present appears to be towards an increase rather than a diminution in the necessities of the mines in this direction. It takes a great deal of effort and ingenuity to collect together 252,328 natives for mining purposes, and unless the small machine drill movement undergoes considerable expansion there is the prospect of the struggle for ore at the expense of development being continued in greater or less degree.

Before dropping the subject matter of the table given above, it may be remarked, *en passant*, that a dearth of native labour is not necessarily accompanied by a proportionate expansion of working costs. The Consolidated Gold Fields at the end of the year had only about half their complement, but a study of their working costs, as shown in the Chamber of Mines analysis, will make it evident that they have adapted themselves to their circumstances in an astonishing sort of way.

Pilgrims Rest Activity.

The Mac-Mac Syndicate output for June was 259 ozs. bullion, valued at £800. The 64 h.p. engine for the Little Octopus has arrived and is being installed. The pegging at Mac-Mac last week passed off quietly, some 58 claims being pegged. The Pilgrims Creek G.M. is reported to have struck a good reef on the northern workings within the last few days.

Mooifontein Diggings.

The rush on No. 4 area still continues, claims being pegged off every day. From three washes taken from this ground last week all proved successful. There are wild rumours afloat about the richness of No. 2 and No. 3 areas, Roodekraal, but they appear to have a good deal of imagination connected with them. A petition is being taken round for signature asking the Government to proclaim the whole of the farm Avondster as a public digging.

TRAINING OF SOUTH AFRICAN MINERS.

Important Statement by Mr. R. W. Schumacher—What the Mines are Doing—Example of Crown Mines and Village Deep—Offer to the Government.

Following on the speech made by Mr. Malan at the Government Miners' Training School anniversary, an important statement was made by Mr. Schumacher at the Chamber of Mines meeting on Thursday, embodying a noteworthy offer to the Government. Mr. Schumacher said:—"There is one point in connection with the speech made by the Minister of Mines at the Government Training School at the Wolhuter last Saturday to which I would like to refer briefly. In one sentence Mr. Malan gave the impression that the school at the Wolhuter was the only place on the Witwatersrand where learners were being encouraged, and at the same time he gave the impression that the mining industry was unsympathetic. I think that I can give the unqualified assurance that that is not the case. We have long realised the importance of training men to become miners, and to fill other important positions in our mines. It is only common sense that we should have done so. We have on our group alone to-day six hundred and three learners both on the surface and underground. I had the pleasure of accompanying Mr. Malan down the Village Deep mine only the day before yesterday, and the manager of that mine was able to give Mr. Malan the assurance that there were more underground learners on the Village Deep alone than in the whole Wolhuter School. Only to-day I received a note from Mr. Samuel Evans, the chairman of the Crown Mines, where they have a hundred and twenty learners underground, of whom about half are Dutchmen. Mr. Samuel Evans says:

> "I believe that the Crown Mines is doing more to train men to become competent miners than any other mine in these fields. Mr. Warriner has always been very keen on this question. Unfortunately, we shall be penalised under the Miners' Phthisis Act. It appears to me that underground learners ought not to be counted in fixing the contributions of the companies under the Act. It is unfair to penalise the companies that go to the trouble and expense of training men.

"That is a point to which I would like to call the special attention of the authorities. Of course, we are not the only group that is training learners. Other groups are doing the same. I only instance these particular figures because I have actual knowledge in regard to them. The system we adopt on our mines differs in certain points from the system adopted at the Wolhuter School. It would take too long to go into all the details. I will only say now that both systems should be encouraged, and will be encouraged. As regards the learners underground at our mines, I may say that recently we have been marking time. With the knowledge that we have now been accumulating for a period of years we feel convinced that miners' phthisis is to a great extent a preventible disease, and before we go any further we wish to ensure that every possible precaution that can be taken to guard against the disease is taken. An immense amount of progress has been made underground in preparing to deal with miners' phthisis during the last few months, and we are convinced that with a big combined movement on the part of the Government, the mines, and the men to eradicate this disease will succeed. We shall then at an early date be able to go forward again and encourage learners underground at our mines. As far as the Wolhuter School is concerned, we shall, as the President has said, do all we can to encourage the students there. In the first place they can be assured—I am sure I am speaking on your behalf in saying this—they can be assured of receiving employment, when they leave that school. I asked Mr. Malan what was in his mind, what would he like us to do for his students, and he said: "Can you show them things of interest on your various mines?" Well, of course, we can, and we shall be more than pleased to do so. We shall be very pleased to arrange tours of inspection of the different mines, so that the Government learners can see the different conditions of working such as exist in the eastern mines, for instance, where the reef is flat, and such as exist in other places. We shall be only too glad to assist them in every way. I might mention that I was a member of the original committee appointed five years ago, to report to the Government on this question of establishing a training school. The other members were the late Mr. Weldon, Dr. Breyer, Mr. J. H. Johns and Mr. G. E. Webber, and at the end of October, 1907, we handed in a full and detailed report on the lines we recommended. We recommended that the Government should take an entire mine, that students should actually take over all the work. We estimated that on the basis of crushing with sixty stamps there would be four hundred and twenty apprentices after a period of three years, thereafter continually putting out 35 trained miners every three months or one hundred for the year, assuming the school to be continually full, and that is there would be an intake of thirty-five learners every three months, and an output of thirty-five trained miners. That scheme was unfortunately never carried out, and I believe it would be a very good thing if that scheme or a similar one could be reverted to. There were at the time difficulties in the obtaining a suitable site. Negotiations were entered into, but failed. The result to-day is that we have a scheme which is, after all, only a partial scheme, a scheme that has comparatively little scope for workers, that gives a very small output of trained men at the end. I would therefore like to make a recommendation to the Government that they should again test ground which they have opened. I have in my mind ground east of Modder B., where the reef is flat and could be tapped without great expense. A few boreholes were sunk, but the results were inconclusive. The area is large and it may be that a little exploitation work would give very promising results. I think I may say that if the Government were to take this matter in hand we are prepared to deal with the whole question on a bigger basis and the mining industry could promise them the same financial support that they were prepared to give in 1907 and 1908."

Southern Messina.

The Southern Messina Copper Mine and Development Syndicate, Ltd., was registered on the 6th inst. in terms of the Companies' Act, No. 31 of 1909. The syndicate has been formed for the purpose of acquiring from Mr. Alfred Vaughan Drew one hundred base metal claims situated on the Government farm Monfarland No. 1433, in the Zoutpansberg district. The property adjoins the Messina (Transvaal) Development Company's farm Vogelzang, and the continuation of the outcrop of the Messina lodes runs for a distance of 1,400 yards southward through the centre of the hundred claims mentioned. The capital of the syndicate consists of £3,500, divided into 3,500 shares of £1 each, of which £1,767 in fully paid-up shares go to the vendor, £233 to the promoter (Mr. George Thomas Lloyd, of Kempsey Buildings, Johannesburg), and £1,000 is deemed sufficient to provide working capital for the sinking of three separate shafts to a depth of one hundred feet each, for the purpose of thoroughly proving the richness of the lodes on the property; while shares representing £500 are intended to be held in reserve. The vendor (Mr. Drew) is receiving no cash for his interest in the property, being content to accept the 1,767 shares referred to as the purchase price of the property, and the work of development, which it is expected will occupy about four months in actual operations, will be undertaken by Mr. Drew himself, who is an experienced miner and prospector.

POISONOUS GASES IN MINES.

Methods for Detecting Carbon Monoxide After Mine Fires and Explosions—Lessons from America.

"Marsh gas" has given trouble recently in the Kimberley mines—where Mr. U. P. Swinburne had a narrow escape—and on one Rand mine. The following extracts, therefore, from an official report of the United States Bureau of Mines are of interest. In connection with its investigation of the causes of mine fires and explosions the Bureau of Mines is making a careful study of the methods that can be used with greatest efficiency for exploring mines containing smoke or suffocating or poisonous gases. The report says:—

The presence of that poisonous gas, carbon monoxide (white damp), in the afterdamp of explosions and fires in mines has caused the death of a great many miners. An inspection of the reports of those explosions and mine fires in which men have been killed shows that this gas is often the cause of the majority of the fatalities. Haldane[1] makes the statement that carbon-monoxide poisoning is responsible for nearly all the fatalities. After a recent disaster at a mine in Pennsylvania in which 21 men were killed the bodies of 17 men showed no such marks of violence as would be produced by the concussion of an explosion. Tests of blood from some of these bodies clearly showed the bright pink hue caused by carbon monoxide. Not only have men present in mines at the time of disasters succumbed to this gas, but rescuers endeavouring to save their unfortunate comrades have perished also. Of the gases produced in mines, carbon monoxide is the most feared and the most difficult to detect. A miner's lamp gives warning of almost every dangerous condition of the atmosphere in a mine except the presence of this gas. Percentages of methane below those that form explosive mixtures can be detected by the appearance of the "cap" of the lamp flame, and a deficiency of oxygen is shown by the smothering of the flame in time for a retreat to be made before bodily harm can result. Carbon monoxide, however, may be present in deadly quantities in an atmosphere without the safety lamp detecting it, because a proportion much below that required to give a cap on a lamp flame is extremely poisonous. Other gases occasionally found in mines in harmful quantity, such as hydrogen sulphide, and oxide of nitrogen fumes can be detected even in great dilution by their odour, so that fatalities from the presence of these gases in mines are few. The author tested the value of a wick flame as a detector of carbon monoxide in comparison with its value as a detector of methane. A Wolfe safety lamp, constructed so that prepared mixtures of air and carbon monoxide could be fed into it at the base, was used. The minimum percentage of carbon monoxide (about 2 per cent.) required to produce a visible cap was found to be almost identical with the required proportion of methane. Two observers could detect no difference in the colour or the height of the caps produced by this percentage of either gas. Neither could they when 3 per cent. of either gas was used. In a mine some observers, especially after becoming accustomed to the darkness ("getting eyesight," as it is termed), may detect a cap when the air contains less than 2 per cent. of methane, and it is possible to detect less than 2 per cent. of methane by the use of special testing lamps. But the point brought out by the author's experiments is that low percentages of either methane or carbon monoxide scarcely give caps that distinguish one gas from the other. Moreover, it has been the author's experience that when a given percentage of carbon monoxide is present in the air of a coal mine, a larger percentage of methane is usually present, so that this gas would interfere with the detection of carbon monoxide by a lamp even if carbon monoxide enough to give by itself a characteristic cap were present. It is also true that in the afterdamp of mines carbon monoxide in quantity sufficient to produce a cap usually accompanies a deficiency of oxygen and an excess of nitrogen, so that the lamp is extinguished before it can show a cap. One result of this last fact, however, is that the indications of a lamp may sometimes prevent a man from going into an atmosphere containing carbon monoxide enough to be rapidly poisonous. The gases that come out of the crevices in the coal bed immediately after shots of explosives may contain much carbon monoxide and hydrogen, besides methane, and when a lamp is held close to the crevices the carbon monoxide and hydrogen may cause the cap of the lamp flame to differ somewhat from the cap produced by methane alone. In exploring mines, however, the great danger to a rescue party is from small proportions of carbon monoxide—proportions so small that they have no visible effect upon the flame. The author is aware that some mining men are of the opinion that a percentage of carbon monoxide below that which is immediately dangerous perceptibly brightens or lengthens the flame of a lamp, but he knows of no characteristic of carbon monoxide that would warrant such an opinion. A possible explanation of the brightening or lengthening, suggested by J. W. Paul, mining engineer of this bureau, lies in the fact that a party exploring a mine containing afterdamp sometimes enters a place in which the proportion of oxygen in the air is larger than it was in the place previously explored, and as a consequence the wick flame burns for a while with increased intensity. As the oxygen content of an atmosphere decreases, the flame of an oil lamp burns more dimly, at 17 or 17.5 per cent. of oxygen, the flame is extinguished.

Occurrence of Carbon Monoxide

Carbon monoxide has not been positively identified in the samples of what may be termed normal mine air collected by this bureau, except in samples collected at the working faces where the air was vitiated by powder smoke. Samples of mine air from the ventilating current, from the main returns, and from splits have been examined, also samples from inclosed areas in which the air had been still; but although the apparatus used was accurate to 0.02 p.c., the author cannot state positively that carbon monoxide was present in any of the samples. A series of tests is now being conducted in which air from sealed bottles containing coal that was freshly mined at the time of bottling is being examined for minute quantities of combustible gases other than methane. Although about 12 examinations have been made of samples taken one week apart, the presence of carbon monoxide has not been positively determined. It appears that carbon monoxide is produced in mines in harmful quantity only through the agency of heat or by the incomplete combustion of carbon that attends explosions, mine fires, the use of explosives, etc. The gas is produced by the imperfect combustion and dry distillation of coal dust in explosions, by the imperfect combustion of methane, by the burning of wood and coal with insufficient supply of oxygen, and by the contact of previously formed carbon dioxide with red-hot carbon, as when the flame of a blast or a gas explosion is projected into an atmosphere filled with the fine coal dust. The last-named cause operates toward the formation of carbon monoxide when those explosives that contain within themselves sufficient oxygen for the complete oxidisation of their carbonaceous components are used in breaking down coal. The carbon monoxide formed, with hydrogen and methane, collects in the open spaces and crevices behind a standing shot, and the miner is often burned by the flame that bursts forth when he carelessly puts his lamp close to a crevice or into an open space to examine the effect of a blast. Besides the danger that attends the burning of these crevice gases, trouble is often experienced from the gases that result from the use of improperly handled explosives in ill-ventilated parts of a mine. A series of experiments is being carried on by the Bureau of Mines to determine the gases that are produced by the firing of different explosives and the extent to which the use of the explosives vitiates the air of the working places.

Properties of Carbon Monoxide.

Carbon monoxide is a colourless and inodorous gas with a specific gravity of 0.967. A liter of it weighs 1.2506 grams at 0° C. and 760 mm. pressure.[2] It will not support combustion, but burns with a pale blue flame. The lambent flame above a grate in which anthracite or coke is burning is due to the combustion of this gas. Carbon monoxide is the main combustible ingredient of water gas, of producer gas, and of blast furnace gas, which contain approximately 15 to 40 per cent. of it, and is present, but in smaller proportion, in illuminating gas made by the destructive distillation of coal. It has not been identified as a constituent of the samples of natural gas examined by the Bureau of Mines, a fact that accounts for natural gas being less poisonous than water gas, producer gas, or ordinary illuminating gas. Carbon monoxide in mixtures with air has a wide range of explosibility, from 16.5 per cent. gas, lower limit, to 74.95 per cent. gas, higher limit.[3] Methane has explosive limits that lie between about 6.1 per cent. gas, lower limit, and 12.8 per cent. gas, higher limit.[4] The lower limits cited have reference to complete combustion and to the ignition of the gas by an electric spark. Other modes of ignition, changes in temperature, the shape of the containing vessel, differences in pressure, and the presence of more or less water vapour may change the range of explosibility somewhat. The addition of a large quantity of carbon monoxide to explosive mixtures of methane and air would have the tendency to widen the upper limit of explosibility over that of methane alone.

Physiological Effect of Carbon Monoxide.

The oxygen absorbed from the air in the lungs is normally taken up by the blood in the form of a loose chemical combination with the red colouring matter (hæmoglobin) of the corpuscles, and in this form it is carried to the tissues where it is used. Hæmoglobin not only combines with oxygen but also forms a far more stable compound with carbon monoxide and when saturated with the latter it can not take up oxygen. Hence, when the corpuscles in the blood of a living animal are saturated with carbon monoxide they can not carry oxygen from the lungs to the tissues, and death must result. According to Haldane,[5] carbon monoxide has no other effect than that resulting from its interference with the oxygen supply of the tissues, and apart from its property of combining with hæmoglobin it is physiologically indifferent, like nitrogen. The affinity of carbon monoxide for hæmoglobin is about 250[6] times as great as the affinity of the latter for oxygen. However, if oxygen is administered to a person not too far overcome it will completely replace the carbon monoxide in the hæmoglobin. In this respect pure oxygen acts about five times as rapidly as normal air, which contains approximately 21 per cent. of oxygen. From air containing very small percentages of carbon monoxide, less than 0.1 per cent., the blood of a man does not take up enough of the gas to cause distress unless the man breathes such air a long time. If the air contains larger proportions, the blood sooner or later reaches that stage of partial saturation with carbon monoxide that produces helplessness. Haldane[7] makes the following observation :—The blood of a man will take up about two pints of CO. or oxygen. A man at rest breathes about 10 or 12 pints of air per minute, and experiment shows that of the carbon monoxide inhaled about 60 per cent. is absorbed by the blood. If a man would breathe air containing 0.1 per. cent. of carbon monoxide he would absorb 0.007 pint per minute. It would then take him nearly 2.25 hours to absorb a whole pint or produce one-half saturation of the blood, at which stage the limbs would become so weak as to cause them to give way when an effort was made to walk. A man who is walking, however, breathes about three times as much air as a man who is at rest, hence he might absorb a pint within an hour. With 0.2 per cent. of carbon monoxide the time would be one-half as long, with 0.3 per cent., one-third as long, etc. If a man who has breathed mine air containing carbon monoxide and has retired to fresh air to recuperate, again enters workings containing this gas before the carbon monoxide has entirely been displaced from his blood, he feels the effects of the gas in less time than when he entered the workings before. The experience of those who have been partly poisoned by carbon monoxide seems to teach that usually much pain or distress does not precede collapse. One of the first symptoms is weakness of the limbs and dimness of eyesight. For some time after resuscitation, however, there may be severe headache, or even epileptic seizures and other serious ailments. Poisoning by carbon monoxide can take place very suddenly. For instance, a man in a mine may quickly pass from a place containing such a small quantity of the gas that he has experienced no distress into a place containing a larger quantity where, because of the already partially saturated condition of the blood, he will quickly succumb. Also, the action of the poison may be accelerated by increased exertion, such as climbing a steep incline or ladder, or lifting heavy weights.

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[2] Rayleigh. Proc. Royal Soc. London. Vol. 62, 1897, p. 204.

[3] Jour. Soc. Chem. Ind. Vol. 21, 1902, p. 395.

[4] Idem.

[5] Jour. Physiology. Vol. 18, 1895, pp. 200, 430, 463.

[6] Haldane, J. S., Causes of death in colliery explosions and underground fires. Report to the Secretary of State for the Home Department. 1896.

[7] Idem, p. 17.

ACCIDENTS AND COMPENSATION ON THE RAND.

New Form of Insurance Policy—More Favourable Terms for the Men.

A new policy is about to be issued by the Rand Mutual Assurance Co., Ltd. This Corporation, in which the majority of the white employees on the mines of the Transvaal, who do not come under the Workmen's Compensation Act of 1907 are insured, deals with some sixty mines. Under the Act a "workman" is defined as a person in regular employ, whose wages do not exceed £500 per annum. The modification in the form of insurance will, therefore, not affect men receiving less than that amount, as this class is protected under the Act. From August 1 all new employees drawing more than £500 will be insured under the new conditions, but those employees who, on July 31, are in receipt of a salary exceeding £500 per annum, will be given the option of remaining under the old conditions, or of accepting the new form. There will be no compulsion whatever. Under the revised conditions the compensation is, in many cases, higher. On the other hand the payments to remote and partial dependents will be proportionate to the amount of the loss they sustain.

Main Provisions.

The following are the provisions of the new clauses dealing with compensation :—For Fatal Accident.—A sum not exceeding one year's wages or £2,000, to be paid to the dependents of the deceased employee. For Permanent Total Incapacitation.—One year's wages with a minimum of £750. For Permanent Partial Incapacitation.—One half of one year's wages with a minimum of £375. For the Permanent Loss of the Sight of One Eye (unless such loss is caused by an accident which caused the employee to be permanently totally or permanently partially incapacitated).—The sum of £250. For Temporary Incapacitation.—Half wages for a period not exceeding six months (subject to further extension in terms of Condition 9 of this policy). Provided always that the maximum amount payable by the assurer to the assured or by the assurer to any white employee of the assured or to the dependents of such employee shall in no case exceed the sum of £2,000 in all, in respect of any one accident to any one white employee.

Position of Dependents.

In case the injury shall directly cause the death of any such employee (who has not received compensation for the said injury in satisfaction of his rights under this policy and who but for such death would have been entitled to claim such compensation) then the assurer shall in the event of such employee leaving any dependent or dependents (as defined in condition 2 hereof), after deducting any amounts already paid to the said employee in respect of such injury, pay to the persons hereinafter mentioned the sum or sums respectively set forth, namely :—In the event of any of such dependents being his widow (whether with or without minor children) to such widow and minor children (if any)—One year's wages of the said employee, provided that where the said dependents are his widow and his child or children under 14 years of age then the minimum amount payable hereunder shall be the sum of £750, the distribution between such widow and children (if any) to be made by the assurer or his nominee, whose decision shall be final and binding upon all parties. In the event of any of such dependents being his minor child or minor children or persons wholly dependent upon him—to each of such dependents the value of (at the time of the accident causing such decease) of the annual loss sustained by such dependent by reason of such decease, such value to be calculated in the manner provided by Condition 13 of this policy. In the event of any such dependents being persons partially dependent on such employee—to each of such dependents half the value (at the time of the accident causing such decease) of the annual loss sustained by such dependent by reason of such decease, such value to be calculated in the manner provided by Condition 13 of this policy. Provided always that the total of the sum payable in terms of this policy shall in no case exceed one year's wages or the value of one year's wages of the deceased (except where a minimum of £750 is expressly provided for above) or the sum of £2,000, whichever shall be the less, and that if such total amount shall exceed the maximum amount payable in terms of this policy, the sum payable to each dependent shall be reduced pro rata. Provided further that the claims of the widow or of the minor child or children of the deceased employee shall be preferent to the claims of any other dependents. And in the event of there being no dependents of the said employee the assurer shall pay to the assured or to the legal representative of the said employee the reasonable expenses of his medical attendance caused by such accident and of his burial.

The Main Alterations.

The main points of alteration are as follow :—(1) The minimum of £750 is payable to a widow with a child under 14 years of age, in place of the present minimum of £500. (2) Dependents benefit irrespective of whether they are heirs. Under the present policy they must be heirs to benefit; even the wife of an employee who dies intestate would not rank as an heir. (3) Wider and fairer definitions are given of the various clauses of incapacitation, which will give employees much more equitable benefits than would be obtained by the strict interpretation of the present policy. (4) In cases of dispute, on medical grounds, provision is made for a settlement by medical arbitrators (one nominated by the employee), whereas at present the assurance company's medical officer has the sole and absolute decision. (5) Half wages may be continued up to 12 months instead of six, as at present. (6) Wages are understood to include house and other allowances, whereas under the old policy these are not included, as in view of the increased benefits to be paid as above, the following further alterations have been made : (a) Losses in fatal accidents, when there are no dependents, are reduced, and partial dependents are to receive a sum proportionate to their loss; (b) Loss of one eye is compensated for by the fixed sum of £250, if no partial incapacitation is caused (in place of the present £375 or half wages, whichever may be most), but when partial incapacitation is caused no reduction is made in the amount now payable. Other alterations are included having the effect of defining more clearly what is payable under the policy, and how such sums are to be paid. The new provisions, which have, in many instances, been drafted in order to meet the wishes of the miners, will be fully explained to the men concerned before coming into force on August 1. When compared with the present policy the new conditions are much more favourable to the men in all respects. For instance, "permanent total incapacitation," under the present conditions, does not provide for injuries to the spine, which may cripple a miner for life. A case of this nature recently came before the Courts, in which an insurance company refused to pay compensation on the grounds that the injured man had not lost the use of both feet, or both hands, or of one foot and of one hand, or the complete and permanent loss and sight of both eyes. Under the new policy "permanent total incapacitation" is defined as "a permanent inability to obtain and perform in this Province work or employment of any nature whatsoever for which salary or wages are payable." There are many other advantages which will be apparent to those concerned when they read the conditions. It is understood that the draft policy has been submitted informally to the representatives of the miners, and that they have expressed their approval of the proposed changes.

MINING ON THE KROMDRAAI LINE.

The Lydenburg Formation North of the Rand—A Five-stamp Battery to be Running in August—High Values Reported.

The erection of a five-stamp battery, 1,250 lbs. weight, which is on the point of completion on the farm Knopjeslaagte, about six miles south-west of the Cantonments at Roberts' Heights, marks the first practical step taken to test the auriferous quartz reef at the Kromdraai horizon in those parts upon an adequate scale. After a period of spasmodic and casual exploratory work that had been prolonged over a considerable number of years, under the direction, first of all, of the Henderson Consolidated Corporation, Ltd., and later of various option-holders, more systematic operations were commenced by the Laly's Gold Mines, Ltd., of which Mr. J. W. Whalley (Messrs. Harper Bros.) was the guiding spirit, and latterly continued by Mr. S. H. van Diggelen and some of his friends, under the supervision of Mr. Harry Green as mine manager, and Mr. H. C. Tromp van Diggelen as consulting engineer. A company has latterly been floated to carry on the venture, under the title of the Pretoria-Premier Gold Mine, Ltd., and one of the tangible results of this flotation is the small milling plant which is now almost ready for action. The directors of the company are Messrs. E. J. van Gorkom, A. W. Stockett (until lately general manager of the Simmer and Jack), S. H. van Diggelen and P. C. Haw.

The Black Reef Series.

The horizon at which the quartz reef is found is between the two quartzite bands lying above the Black Reef, which form a prominent object over many miles of landscape between Kromdraai and Knopjeslaagte, along the southern edge of the dolomite. The rocks belonging to this section, which is known as the Black Reef series, consist mainly of quartzites and shales, with occasional bands of conglomerate at the base, dipping on an average from 10 to 20 degrees north, and lying conformably under the manganiferous shales of the dolomite formation. The Black Reef conglomerate is found well developed at some points, particularly upon Knopjeslaagte, but generally the gold values are low and of no economic importance. The gold carrier of the section is the interbedded Kromdraai reef, a quartz body which varies from a mere stringer to a few feet. At Knopjeslaagte, in the workings which have been made by the Pretoria-Premier Company and in their immediate vicinity, the gold values are in some places high. The mine is opened up around an incline shaft which was put down by Dr. Dorffel before the war, from which he reported very high assay results. Work done by the Laly's Gold Mines in a drive east of the shaft is said to have lost the reef through a fault; in any event the gold shoot was not found laterally in that direction. The Pretoria-Premier, going westwards, picked up the gold at once.

Assay Values.

The following information is taken from a report made in the early part of the year by the consulting engineer:—"*Workings*.—These consist of four incline shafts and several winzes, following the reef on the dip to the north, and also stripping work along the outcrop. No. 1 shaft follows the reef at an incline of 10° for 65 ft., and then at 45° for another 20 ft. This shaft is now being deepened to 100 ft., and connected by drives to Nos. 2 and 3 shafts. The reef is well defined and averages some 10 inches here. A composite sample from the surface to 50 ft. assayed 1 oz. 3 dwts., and I have always averaged an ounce with the pan. *No. 2 Shaft*.—This is at present the main shaft, but as it contains exceedingly rich ore I will have it demolished and will use No. 1 shaft for hauling. A new shaft is being put in to the S.E. No. 2 shaft is inclined at 30° to a depth of 40 ft., from there to 80 ft. it dips to 45° and then to a depth of 275 ft. at 15°. The reef is easily traceable over the whole length of the shaft. From the surface to 40 ft. the quartz is of a sugary, chalky nature carrying visible gold in some places, from there downwards it becomes more vitreous and thicker. At 100 ft. there are two drives running N.E. and S.E. In the N.W. drive at 35 ft. the reef becomes much thicker; it has been driven on for another 30 ft., and in the face the reef is 3 ft. wide, but is irregular and has enclosures of quartzite and schist. An assay taken across the whole width here gave 7 dwts. 12 grs. The foot-wall and hanging-wall of the reef are variable, sometimes consisting of slate and sometimes of quartzite. The reef in the shaft would average about 8 ins. in width; in some places it is over 12 ins. Assays made on a former occasion gave results as follows:—

	Ozs.	dwts.	grs.
7 feet	3	6	0
17 feet	10	16	0
27 feet	7	17	0
37 feet	0	6	12
47 feet	10	12	0
57 feet	0	2	0
67 feet	0	14	12
77 feet	1	5	0
87 feet	2	1	12

A composite sample taken at every 5 ft. down to 180 ft. gave an assay of 33·8 dwts. After my examination of the reef, and taking into consideration the pannings I made, I have no reason to doubt the above assays. I took samples of the whole length and thickness of the reef from the surface to 40 ft., and from there to 100 ft., the assays (Bank of Africa, Ltd.) were as follows: Surface to 40 ft., 5 ozs.; 40 ft. to 100 ft., 1 oz. 8 dwts. Two pannings were made of sugary quartz at 20 ft., and I estimate both of these to be more than 20 ozs.; the gold was coarse. A composite sample which I took from the surface to 30 ft. showed quite 5 ozs. in the pan. At 17 ft. I obtained four pannings which I estimate at not less than 100 ozs. to the ton. No. 3 shaft is 500 ft. to the south-east of No. 2. The reef dips at 10° and the shaft follows it for 40 ft. Here, again, good pannings were obtained, some as high as 20 ozs."

The following remarks appear in a circular dated 13th June, 1912:—"The stamps will be dropped in the first week of August, so that the company will have its first gold return in September, and it is hoped that the first dividend declaration will be made during that month. No. 1 shaft and the winze from the 100 ft. level have both reached a depth of 180 ft. and the reef remains well defined in both. There are now some 1,200 tons of ore on grass and about 4,000 tons of ore blocked out. Mine development is being proceeded with vigorously in day and night shifts."

New Vaal River Diamonds.

During the month of June, 102 diggers on the New Vaal River Estate produced 1,533¾ carats of diamonds, which realised £10,053 2s. 6d. Included in this output were one 17-carat stone at £17 16s. 5d. per carat, one 8½-carat at £14 2s. 6d. per carat, one 14-carat at £13 per carat, one 11-carat at £12 5s. 5d. per carat, one 30-carat at £11 10s. per carat, one 18½-carat at £11 7s. per carat, one 53, one 37¾, one 32¾ and one 22-carat at £11 per carat each, one 20½-carat at £10 per carat, one 14-carat at £10 per carat, and stones of 28 carat, 23¾ carat, 22¼ carat, 20¾ carat, 20¼ carat, 15¾ carat, 12½ carat, 12 carat, 11 carat, 10½ carat, and 10¼ carat.

Metalepsi Alluvial.

This company has increased its nominal capital, and is arranging to introduce further working capital to test the ground.

TRAINING OF ARTISANS IN SOUTH AFRICA.

A Difficult Problem—Some Practical Hints.

In a paper on "The Training of Artisans and Skilled Operators in South Africa," presented before a meeting of the Society of Civil Engineers, Mr. H. Bromley tendered some practical suggestions for coping with a problem which, as he contended, would require settlement in the near future. In the course of his remarks, Mr. Bromley said:—

When the engineer undertakes the construction of works the most important question is that of labour, whether employed directly or through he medium of a contractor, and most engineers who have been responsible for construction and maintenance of works have felt the want of good tradesmen, skilled operators and gangers. The latter especially must remain one of difficulty, unless they are trained in South Africa for the work. Of tradesmen, the supply is more or less maintained by immigration, and in times of prosperity there is a natural rise in the rate of wages, and many first-class tradesmen immigrate only to emigrate on the approach of slackness of work. In these days of cheap ocean travel an efficient solution of the difficulty is at hand, and the country is spared the expense of maintaining the men during slack periods, otherwise increased wages would be necessary to cover those periods of depression. The term "labour" is taken to include all those not included in the office staff, and may be said to include general foremen, tradesmen, skilled operators, gangers and labourers. The ideal system for the training of tradesmen is that of the apprenticeship, where the youth on leaving school is put under the control of the finished tradesman. In large works he goes under several craftsmen during his apprenticeship. He is on quite a different footing to the labourer; and however much knowledge the latter gains of the trade, he always remains a labourer with a gulf between him and the tradesman. The educational standard to be attained in Great Britain before a boy can be apprenticed to most trades is that known as the Sixth Standard, and in the large shops and shipyards he has to attend night schools, where further instruction is given in details of his trade and, for those whose trade is constructive, instruction in drawing.

Cost of Apprenticeship.

In South Africa, it will be sufficient to take a typical case of a carpenter's apprentice. The apprentice has to affirm that he will complete five years—and his guardian usually signs an affirmation to that effect—with the option of remaining on as an improver. The wages paid the apprentice may be taken about as follows: 1st year, 5s. per week; 2nd year, 7s. 6d. per week; 3rd year, 10s. per week; 4th year, 15s. per week; 5th year, 20s. per week. These rates are a considerable advance on Home practice, and even at these rates it will be seen that the guardians of a boy are put to considerable expenditure to maintain the boy during apprenticeship, which is one of the chief reasons for the short supply of tradesmen of South African training. Allowing board and lodging at 25s. per week; clothing, say, 4s. 3d. per week; pocket money, say, 9d.; it may be said that an apprentice costs: For the first year, £65; for the second year, £59; for the third year, £53; for the 4th year, £41; for the fifth year, £25; total, £243. Therefore, the direct expenditure for the training of a carpenter in South Africa costs, say, £250. The same in Great Britain may be attained for the expenditure of about £50, as after the fourth year the apprentice will be self-supporting, his board and lodging costing, say, 7s. 6d., clothing 1s. 3d., pocket money 6d., for the first year or two.

Utilising the Raw Material.

Seeing we have ample raw material in the country with the percentage increasing, unless the available supply is directed into useful channels, it is more than likely to become a burden to the State and people. It is, therefore, well to consider now in what way it may be directed to better advantage. Firstly, the more stringent application of the Compulsory Education Law. Secondly, the provision of trades' night schools at as many centres as possible; not large institutions, but small schools, where in separate classes the various trades may gain instruction in that trade. In passing, it may be stated that it should be possible to draw instructors for these night schools from draughtsmen and tradesmen employed in the local shops and works. In Great Britain and parts of the empire termed "White Countries" there is no dearth of men suitable for gangers, the reason being that after compulsory education it is necessary that the boy should commence to earn his living, and he goes into works under the term of a "nipper," carrying water, etc., and progresses through small jobs not beyond his strength, and thus on to manhood. By that time he may have had experience in many kinds of work, and those of ability later on become foremen. In South Africa it does not frequently happen that white boys go right on to works. In consequence, they grow up without knowledge of how works are done, or what amount of labour should be expected from a labourer. In the railways and at the ports of the Union there are ready-made training schools for tradesmen, skilled workers, gangers and good useful labourers. As these training schools are able to train all the Europeans available for many years to come, in time the result will make it unnecessary to send out of South Africa for any men. In considering how this may best be attained, the boys must be trained from the commencement. Any system of employing white labour should aim at getting the material before manhood is attained and making men out of them.

An Ideal System of Training.

What appears to be the ideal system of training is much as follows:—The preliminary education being completed, those for trades having passed the 6th Standard, the others having at least attained the legal minimum, the boys destined for apprenticeship should be apprenticed to the trade selected and the attendance at a night school or classes during the apprenticeship should be made compulsory. Those whose intentions are to be come skilled workers, gangers, and labourers should be given a six months' training in rough carpentry, instruction in the use of the tape, level and straight-edge, boning-rods, setting of batter lines for earth work, and such simple arithmetic as is necessary. This instruction should be imparted by a man of mature years, preferably by a pension P.W. inspector or a carpenter who has some knowledge of outside work. On completion of this course, the youths should be drafted into the permanent way gangs, the maintenance gangs at the ports, and the operating departments of both, and set to do the works usually carried out by coloured labourers. If such gangs got a few hands each year they would have youths of all ages up to manhood, the senior hands undertaking the heavier work. No pay would be given during the six months' training, it being assumed as an extended school course. Promotion to the grade of second man and from that to ganger could only take place after a probation period of, say, four years and upwards in the gangs. Those wishing to leave at any time would of course be at liberty to do so, but says four years' continuous service should be an essential qualification, and should one decide to leave he would receive a certificate and character. Any wishing to join, not having taken the preliminary training, would only be promoted if those taking the full course were not available; those not possessing the necessary education or of mental deficiency would of course remain labourers. In making promotion from a gang preference would be given to the most skilled and reliable in their duties, while the others would be absorbed as porters and station loading hands. Provision might be made for some of the hands to be seconded (to use a military term), so as to be available for other works or go on construction. It should be insisted upon that they read a weekly or a monthly journal. Interest in reading will be found a comforting and educative recreation in out-of-the-way places. The rates of pay to be given to the boys on joining should be at least sufficient to keep them. In most cases food can be provided for about 1s. 6d. a day; clothing, when purchased ready made, about 8d. If the rate of pay was fixed at 2s. 6d. per day it would ensure that the boys earned sufficient to keep themselves, and any advance on these rates would depend on the progress made. These terms would encourage the youth without prospects to join and be trained.

Inadequate Wages.

The occupation of a white unskilled labourer is not very attractive at the present moment on account of inadequate wages, and if advice were asked for from one in that position, Australia would be cited, where the minimum rate of wages on the New South Wales Railways is 7s. per day of eight hours, and not enough labour to go round. Since all the conditions point to an increase in the number of Europeans who from necessity must earn their livelihood as labourers, the question of what the country can and ought to afford will require settlement in the near future. It may be found more economical for the country to pay a larger wage and do less in other ways in assisting the indigent white; at the same time, as there is not sufficient coloured labour to satisfy all the requirements of the Union, this would be of greater value to the country. The rate of pay for an adult Epropean labourer is one of some difficulty; generally speaking, the standard of living is correspondingly lower in South Africa than in Great Britain, Canada, or Australia, and the wages value of the labourer is correspondingly lower, due in a measure to cheaper man-per-day coloured labour. A gradual increase of wages would trend in the direction of evolving a better stamp of workman, and at the same time he would have more to spend in educating his children.

White Labour Inefficient.

But notwithstanding that the unit prices of work are dearer in South Africa than in the other three countries mentioned, one is forced to the conclusion that the white labourer is less efficient in South Africa. This want of efficiency may be the outcome of the example of the coloured labourer and the want of training of the European labourer to continuous labour during the working hours, proper rest and food, also in the better training in the use of the simple tools. The proper feeding of the labourer and the development of the system to convert all the nourishment necessary so that the man may work daily without undue fatigue is an important point. It frequently appears that one man with apparently larger expenditure of effort with, say, a shovel, does a less amount of work than could be done by the same amount of effort properly directed by training. For the art of slinging mud in a graceful and efficient manner the Irish navvy, with a long-handled shovel, easily holds pride of place; these men in Australia handle 15 to 18 cubic yards per man per day of eight hours in easy digging. There is no reason why the South African labourer should not be quite as efficient.

Purchasing Value Compared.

It may be useful to compare the purchasing value of £1 with Great Britain, Canada, and Australia. The following table is an approximate one.—

	S.A.	A.	C.	G.B.
	s. d.	s. d.	s. d.	s. d.
Purchasing value of £1...	20 0	25 0	28 0	32 0
	—	1.25	1.4	1.6
Actual Wages paid	4 0	7 0	6 0	5 6
Wages based on value (purchasing)	4 0	8 9	8 5	8 8

A larger proportion of wages can be saved in South Africa, Australia, and Canada, as the labourer in most cases lives rent free, in either a hut or tent owned by himself, or, in the case of Canada, in quarters provided by his employers. In Great Britain rent has to be paid. In conclusion, it may safely be said that 4s. is not an adequate wage for an adult unskilled white labourer in this country, and it is next to impossible for a man to supply the necessities of food for himself and family out of that sum.

Essentials of Proper Training.

In summarising this paper, the writer contends that for the proper training of tradesmen, operators, skilled labourers, gangers, and unskilled labourers, it is essential to have: (1) Compulsory education up to the Sixth Standard in the case of tradesmen, and up to the Fourth Standard in the case of others; (2) the indenturing of apprentices to the various trades; (3) the providing of local night classes or trades' schools; (4) the providing of practical instruction from first-class tradesmen; (5) the opportunity for training of tradesmen, skilled workers, operators, gangers, and labourers in the undertakings of the Union; (6) the rearrangement of the scale of wages to attract the class of man required.

National Diamonds.

RE-ORGANISATION SCHEME.

An extraordinary general meeting of the shareholders in the National Diamond Prospecting and Developing Syndicate, Ltd., was held this week to pass certain special resolutions. Mr. W. W. Grose (chairman) presided. In explaining the objects of the meeting the chairman said:—At the last meeting we held it was our opinion that the next would have been our general meeting; unfortunately, as most of you are aware, owing to a legal informality we have to go over all the details necessary to the reconstruction of your syndicate. The informality is one which has happened to others and might have been made by anyone. We calculated that between May 3, when our extraordinary general meeting was held, and May 17, when the confirmatory meeting took place, that we had the necessary interval; instead we were a few hours short, hence the necessity for calling you together again. The time, however, has not been wasted. Your mine has been put into thorough good working order; and machinery overhauled and added to, while a certain amount of washing has been done. Your directors are satisfied with the results obtained, and I must ask you to let it rest at that. We are here only for reconstruction purposes to-night, to anticipate other details we are certain would not be for the benefit of our shareholders until the new scrip has been issued. I will now ask the secretary to read the necessary resolutions to enable the reconstruction scheme to become an accomplished fact. Mr. J. Randall proposed that: In view of the exhaustion of the working capital of this syndicate and the expiration of the option contract on the farm Rietfontein No. 501, district of Pretoria, and the urgent necessity existing for obtaining further working capital in order to preserve the assets and meet the liabilities of the syndicate and also to secure a new and extended option contract on the said farm Rietfontein No. 501, together with additional machinery and plant for carrying on the objects of the syndicate, be it now resolved that the offer of J. F. Black, of Johannesburg, be and is hereby accepted for the reconstruction of the syndicate in the manner following to wit: (a) To reduce the nominal capital of the syndicate from twenty thousand pounds (£20,000) sterling to seven thousand five hundred pounds (£7,500) sterling; (b) To then increase the nominal capital of the syndicate to thirty thousand pounds (£30,000) sterling; (c) The said capital of thirty thousand pounds (£30,000) to be apportioned as follows:—To shareholders in the National Diamond Prospecting and Developing Syndicate, Ltd. (in shares), £7,500; to Mr. J. F. Black, for reconstructing and financing the syndicate and for procuring a new option contract for two and a half years (in shares) £10,500; for working capital, £3,500; to reserve capital, £8,500; total, £30,000. This was carried unanimously.

Union Diamonds.

In the Rand High Court, this week, on the application of Mr. R. MacWilliam, an order was made dissolving the Union Diamond Mines, Ltd., and the liquidator, Mr. A. Rodger, was released.

G.S.W.A. Diamond Taxation.

Reuter's correspondent at Luderitzbucht, writing on the 13th of July, states that private advices have been received from Windhuk to the effect that the German Colonial Secretary has now agreed that the various diamond companies shall have the option of paying their tax either by the old or the new system, whichever may be to their advantage, for the whole of 1912. Previously the Colonial Secretary had agreed that this should be done only up to the 31st of March last, with a retrospective effect from the beginning of the year.

Waterberg Activity.

Mr. T. C. Scoones, M.I.C.E., of London, a director of the Nigerian and Waterberg Tin Fields Trust, Ltd., is paying a business visit to the Waterberg district. Since his arrival he has been busy inspecting claims on Delagoa, Bellevue and Appinendam.

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THE MINERALS OF THE MURCHISON RANGE AND DISTRICT.—V.

Account of the Haenertsburg and Woodbush Goldfields—Gold-bearing Deposits of the Black Reef Series—An Important Government Report on the Results.

Corundum.—The best-known locality for corundum occurs at Malelane, in Older Granite, gneiss, and basic schists as country rocks, at a spot frequently referred to as Geyer's Corundum Claims. The corundum-bearing rocks have been opened up only in a few short trenches and one or two pits seven to ten feet deep; the exact spot is somewhat difficult to find, and lies about fifty minutes' walk in a westerly direction from the main drift on the Malelane River. The geological conditions of the country round are identical with those which one meets along the April Kop road between the Putwana Hills and Malelane, and show an intimate association of foliated hornblendic gneiss and soft talcose or chloritic schists, sometimes exposed in larger slabs and frequently interrupted by coarse white pegmatites. The surface is gently undulating, with numerous shorter ridges separated by smaller well-marked gullies and depressions. The corundum deposits are exposed on the slopes of one of these, but as very little prospecting has so far been done it is quite impossible to estimate the quantity available. The minerals occur in ill-defined lenticular bodies of holocrystalline greenish schists, or sometimes in massive blocks several cubic feet in size, and without well-marked divisional planes. In one pit the rock is in contact with a hornblende gneiss on one side, while on the other lies coarse white pegmatite. The true thickness and extent or persistence horizontally and vertically are extremely uncertain, and the present outcrops may be regarded rather as an interesting mineral occurrence than an economic deposit of commercial corundum. The rock shows extreme variation in the relative abundance of its constituent minerals, which, as seen in hand specimens, comprise vivid emerald-green mica, purely white margarite, long-bladed crystals of blue cyanite (disthene), pink finely granular ruby, pale bluish coarse corundum, and black tourmaline. One phase consists almost entirely of bright emerald-green mica in packed flakes, another has a mottled appearance due to pale ultramarine coloured disthene on a vivid green background of mica. The disthene in these latter varieties occurs in long flat-bladed crystals several inches in length and up to one inch wide, enclosing scattered grains of pink ruby about the size of a pin's head. Another extreme phase consists almost wholly of very fine-grained to nearly compact granular crystalline pink translucent ruby. Between these different types there are numerous intermediate varieties grading into one another. In places the rocks are slightly banded, due to layers of almost pure ruby rock alternating with bands made up wholly of green mica; in other types there is much intermingling of the mica and corundum; usually the richer the proportion of ruby, the finer-grained, more compact, and harder the rock; the hardest varieties practically defy trimming by hammer. Most of the above types are extremely brilliant and showy rocks. Tourmaline has been found in scattered stellate or rosette-shaped clusters of black needles several inches in length. Corundum occurs in two forms, commonly as finely granular dirty pinkish ruby, but also in irregular coarser patches, carrying large rounded crystals of pale bluish-grey corundum three-quarters of an inch in diameter, and set in a soft greyish-white matrix of pearly margarite in thin flakes. The ruby portion rarely shows grains as large as a pin's head, and its possible use as a gem stone is very doubtful, since it is in any case difficult to separate out, though it might be used in connection with the now well-established artificial manufacture of rubies by the fusion of smaller grains. The coarser lighter coloured patches with the larger bluish crystals of corundum embedded in a soft matrix would probably be more suitable for treatment on a larger scale, and might serve as a useful source for common abrasive corundum if larger quantities are eventually located. Thin sections of various types of these rocks show pale pink granular ruby in rounded grains with sometimes good crystal outlines, associated with a kind of zonal structure, marked by a pale brownish cloudy interior; in sections cut from the finer grained red varieties rich in ruby, practically the whole slide is made up of this mineral. Under the microscope the green and blue-green rocks consist of long rectangular plates of very pale blue disthene, which enclose isolated granular crystals of ruby and are surrounded by faint green or almost colourless mica. This mineral has a mean refractive index considerably lower than disthene; in hand-specimens it shows a perfect basal cleavage, producing soft elastic flakes which in convergent light give a well-defined biaxial interference figure. Chemical tests show that it belongs to the alkali micas. No definite properties were noticed by which it might be referred to the group of brittle micas. In place a deep reddish-brown material is found, having a very high refractive index and occurring in grains, short stout rectangular crystals, and occasional elbow twins; it is probably rutile.

The bulk analysis of the red ruby rock is as follows (see under I.), while the heavy portion, separated by means of methyl iodide, gave the results shown under II. :—

	I. Per cent.	II. Per cent.
SiO_2	38.72	3.00
Al_2O_3	52.9	93.76
Fe_2O_3...	trace	—
FeO	trace	—
MgO	5.16	2.23
Na_2O	1.45	—
Loss on ignition	1.10	1.00
	99.33	99.99

The above figures indicate a very high percentage of alumina which is well reflected in the mineralogical composition. Whatever may have been its original characters, the rocks have clearly undergone intense metamorphism. The high percentage of alumina points to a sedimentary rock. In the contact aureole of the Bushveld Plutonic Complex, both corundum and disthene have been observed, the latter under conditions which clearly show that the rocks were entangled in the intrusive magma and to some extent invaded by its material; such hybrid rocks were described from Potgietersrust* and identified as xenoliths of intensely altered shales. In their general characters, mineralogical and chemical composition, the present occurrences show certain analogies, and are best regarded as accidental xenoliths of highly metamorphosed argillaceous material caught up by the magma of the Older Granite and gneisses. As far as present indications go, there is little probability of the corundum deposits of Malelane acquiring commercial importance as a source of gem stones, though, if larger quantities should be found, they might serve as deposits furnishing common corundum for abrasive and other uses, e.g., watch jewels, for which object large quantities are mined in the United States.

Apart from Malelane, corundum has been found in the Mica Fields of the Mashishimala Hills, but was not seen by the writer. "Specimens from that locality consisted almost entirely of a mass of silvery white brittle mica crowded with nodules of corundum from one-third to half an inch in diameter. The corundum is bluish-grey in colour, opaque or slightly translucent, and shows a well-marked cleavage. The flat faces arising from breakage along the cleavage planes are hexagonal in shape, with zonal markings around their margins, and there is no sharp boundary between the unaltered corundum and the surrounding alteration products."†

A third occurrence of corundum was located during the present survey on the farm Toul No. 191, a few yards from the north side of the narrow belt of dark green serpentinous rocks. The locality is situated between the Tsele Meetzi and Macoutsie Rivers, on the south of an intervening tributory. On the road which leads across Toul No. 181 in a north to south direction, as well as within a few yards on both sides of it occur small outcrops of a soft reddish-white coarsely granular decomposed rock containing numerous rounded crystals of bluish-grey corundum scattered evenly throughout the rock and enclosed in a soft white micaceous matrix. The size of the corundum is usually very even and departs little from an average diameter of one-eight of an inch. Certain varieties, especially on the deep dirty brown weathered surface, show many conspicuous elongated needles of corundum up to one inch in length. Distributed sparingly are small isolated crystals of black tourmaline. In other phases the corundum becomes much reduced, or is even absent altogether, when abundant short slender needles of black tourmaline occur freely and the rock assumes more the appearance of an aplite. This locality is easily accessible and healthy. As far as the writer is aware, the above represents a new corundum occurrence which might be further prospected with advantage. The same applies to the previous localities of corundum noted above, where systematic prospecting has apparently never been undertaken, the discoveries hitherto made being the result of accident rather than design.

(To be continued.)

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* A. L. Hall and C. C. Gardthausen: Note on some Remarkable Xenoliths of Altered Slate from the Norite of Potgietersrust and Mapochs Country. Trans. G.S.S.A.. 1991, p. 74.

† E. T. Mellor, *loc. cit.*, p. 51.

Nourse Mines.

In our advertising columns will be found a notice of the declaration of dividend No. 16 of 5 per cent. by the Nourse Mines, Ltd. The following note has been cabled to London and is published for information: "It is estimated that the net earnings will be at the rate of 15 per cent. for the half-year ending 31st July, but directors have decided to reduce the rate of dividend for half-year to 5 per cent., which will leave the company with a cash indebtedness of £16,244. It is estimated that a further sum of £24,000 will be required chiefly to complete the underground work in connection with reopening of South Nourse shaft and also £20,000 for transport arrangements from this shaft to the batteries. This expenditure will complete the concentration programme which is necessary for proper working of the mine in depth and from which great benefit will be derived." We deal with this matter elsewhere in this issue.

MINING MEN AND MATTERS.

The Minister of Mines, Mr. F. S. Malan, was the guest of the Executive of the Chamber of Mines at a luncheon at the Carlton on Tuesday.

* * * *

Mr. James Littlejohn, of Littlejohn and Whitby, assayers and analytical chemists, left on a business and pleasure trip to the Old Country this week.

* * * *

The Minister of Mines has been pleased to appoint Mr. John Walker Craig a member of the Miners' Phthisis Prevention Committee during the absence of Mr. Charles Duff Leslie.

* * * *

Mr. C. B. Kingston, of the London consulting engineering firm of Pearce, Kingston and Brown, who has been identified with the firm of Lewis and Marks for some years, returned to London this week.

* * * *

It is notified that the St. John Ambulance Association is recognised by the Minister of Mines as an association for the issue of first aid certificates in terms of Regulation No. 277 (3) of the Mines, Works and Machinery Regulations, 1911.

* * * *

It is notified that His Excellency the Governor-General has been pleased to appoint Umfreville Percy Swinburne, A.R.S.M., F.G.S., M.I.M.M., M.I.M.E., Inspector of Mines, as Chief Inspector of Mines for the Union of South Africa, the appointment to date from the 1st July, 1912.

* * * *

Messrs. L. Hirsch & Co., of Warnford Court, Throgmorton Street, London, E.C., write, under date June 28th, 1912: "We beg to inform you that Mr. Alexander Marc and Mr. Otto Beit retire from our firm from this day. The business will be carried on as heretofore by the remaining partners."

* * * *

The ordinary general meeting of the Chemical, Metallurgical and Mining Society will be held in the Lecture Theatre, South African School of Mines, Eloff Street, this (Saturday) evening, the 20th inst., at a quarter to eight. The presidential address will be delivered by Mr. Walford R. Dowling, M.Inst.M.M., president.

* * * *

His Excellency the Governor-General, under the powers vested in him by section 1 of the Miners' Phthisis Allowances Act, 1911 (Act No. 34 of 1911), has been pleased to appoint Sir William St. John Carr, Kt., a member of the Board constituted under the section, *vice* Mr. Henry Benjamin Price, resigned, the appointment to date from the 1st July, 1912.

* * * *

The following gentlemen have been selected by the Minister of Mines as members of the Board constituted under section *three* of the Miners' Phthisis Act, 1912, viz.:—Messrs. Johannes Lodewicus van der Merwe, Mining Commissioner, Johannesburg, chairman; Frederick Charles Bigger, Receiver of Revenue, Johannesburg; Sir William St. John Carr, Wilfred Wybergh, and Boudewijn Gerrit Verselewel de Witt Hamer as Secretary to the Board.

* * * *

Applications are invited for the posts of four Assistant Inspectors of Mines on the establishment of the Mines Department at salaries commencing at £450 per annum, and rising by annual increments of £20 to £550, together with local allowances while stationed in the Transvaal, and transport and subsistence allowances as provided by the Civil Service Regulations. Intending candidates should forward applications to the Government Mining Engineer, New Law Courts, P.O. Box 1132, Johannesburg, together with particulars of their qualifications and experience and copies of their testimonials, not later than the 15th August, 1912. The successful applicants will be expected to assume duty early in September, 1912, and will be on probation for a period of twelve months.

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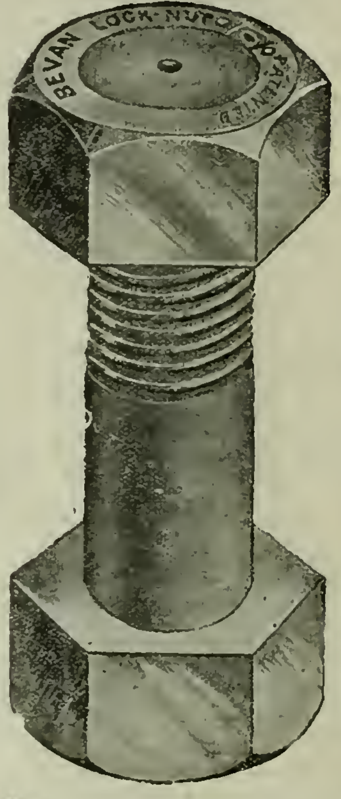

A few :—

1. It is proved to be thoroughly effective, can be made to lock backwards or forwards or both.

2. Simple in construction and application, is declared by **Engineers** to be mechanically sound.

3. It is an absolute lock.

4. It does not slack back.

5. It is as easy to screw on and off as an ordinary nut.

6. It is self-contained.

7. It does not damage the bolt or thread.

8. It automatically locks itself in position and is **proof against vibration.**

9. Fool proof, stronger than the Bolt itself and British made.

10. It enables the Engineer, Battery Manager, Mechanic, Motor Man, or anyone else in charge of Machinery, Rolling Stock, or structures, subject to vibration, where the **BEVAN LOCK NUT** has been adopted to rest assured that the ever present danger of bolts shaking loose, has at last been overcome.

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SOUTH AFRICAN INSTITUTION OF ENGINEERS.

President's Inaugural Address—Mining and Metallurgy.

At a meeting of the South African Institution of Engineers, held at the Chamber of Mines last Saturday night, Mr. Jas. A. Yule, the newly-elected president, delivered his inaugural address. He said:—

I wish again to take the opportunity of thanking the members of the Institution for the honour they have done me in electing me their president, an honour which I deeply appreciate, and hope, with the aid of the Council and members, to justify. To the newly-elected president falls the pleasant duty of addressing you. I find it a somewhat difficult matter to select a subject which is entirely original, because most of the members, like myself, are closely connected with the gold mining industry; but fortunately for us we do not all think alike, neither do we hold the same views in regard to the present systems in vogue on the different gold mines of the Rand. It is very interesting to note development when visiting the newly equipped mines as they come into the producing stage, and it has been the pleasure of many of us to view such plants together. As each new plant is designed it has the benefit of the sometimes expensive experience bought by its predecessors, though some new plants do not vary greatly from what has now become the orthodox. In viewing some of the more modern equipments one is struck by the time the designers must have devoted to scheming out the plant so that a minimum amount of unskilled labour will be required. With the general cry of "labour shortage" this point in the design cannot receive too much attention. Those who are now in charge of mining plants, which were designed before the question of labour played so important a part, are in frequent difficulties to devise ways and means for economising labour without incurring a considerable amount of capital outlay. Circumstances may make it inadvisable for the responsible person to recommend capital expenditure—discretion being the better part of valour. However, with newly designed plants these difficulties should not arise. Money is well spent when used in allowing ample time for the designing of new plants provided that the work is put in the hands of a man who has practical as well as a theoretical knowledge and experience of mining plant generally. No matter how thorough an engineer's knowledge may be, I hold that unless he has had the necessary experience, his "paper ideas" which may look ever so nice and ingenious, may prove most expensive when put into actual practice. I think most of you will agree that I state a fact when I say that after the mill and auxiliary plant are once put into operation it is no easy matter to remedy any evils of bad design which may become apparent, the exigencies of work not allowing for stoppages, which on a gold mine mean a decrease of output and profit. As you are all aware no new gold recovery plant is considered complete without tube-mills. Though the gravity stamp is still installed as before, it is true that the falling weights are being increased and the stamps are put in to do a considerably higher duty than was expected of them before the advent of the tube-mill. Prior to the tube-mill becoming a generally accepted unit the gravity stamp was considered to be the most efficient and economical fine grinder; to-day the gravity stamp is not called upon to perform fine crushing, and, with the increased duty performed by them when crushing to a size to pass the coarse screens, the total amount of water used is much increased. At the present time, owing to last season's meagre rainfall, many mines are confronted with the serious question of probable water shortage.

More Economy in Crushing.

It appears to me that though the gravity stamp proved to be most economical and efficient as compared with other machines for finely grinding or pulverising in one operation, it is quite possible that to-day more economical and efficient means of coarse crushing could be used to supply the product required by the tube-mills. This alteration in the type of appliance for obtaining a coarse product has been made feasible by the elimination of amalgamation in the battery. I have no first hand data to work upon, but I think that 2 or 3 stage crushing could be introduced, the product from the last stage being cubes of ½ inch and less; this product to pass through rolls, the rolls to crush to the fineness required by the tube-mills, say to pass a screen having 9 or 12 holes to the square inch. Trommels being used to separate all the finely crushed material at each stage. Presuming that steel for the shells could not be obtained to withstand the abrasion without excessive cost for spares, it is possible that some form of shell made upon lines of one of the patent tube-mill liners, could be made at a low enough cost, so that renewals and repairs would be lower in price than the spares and repairs of a gravity stamp installation of the same capacity. In my opinion it would pay the various mining groups, especially those who contemplate opening up new properties, to contribute to a common fund to investigate this matter, and allow, say the mines trials committee, to experiment with rolls having shells made of different materials and construction and test the crushing efficiency of such machines. In such a system of coarse grinding there would doubtless be a considerable reduction in water requirements, return water pumping power costs being incidentally reduced, a considerable and constant item on most properties. To reduce water requirements further, and at the same time accelerate the extraction of gold, I see only one reason why the cyanide solution should not be introduced in place of water at the crushing rolls, my one single reason against this I will mention later. For sliming purposes it would be advisable to have the site for the crushing plant so situated in relation to the sand and slime plant as to allow an ample fall to provide for a system of classification; otherwise the cost of power for re-elevating the pulp to the necessary height might be excessive. All amalgamation would be abandoned if the above system were adopted. It is said by some authorities that rolls would not be economical for large daily tonnage, but I think that with careful design rolls would prove more efficient for coarse crushing than the gravity stamp, on a basis of the average crushing capacity of the mines on the Rand. The capital cost of a plant on the above would be considerably less than that of the present-day plant, besides which there would be a great reduction in attendance, power, labour and repairs costs. In power costs there would be, I think, a very great saving, more tube-mills would be required on account of the coarseness of the produce being increased, but even allowing for the additional power required for tube-mills and crushers used in conjunction with the rolls, there would still be a saving. Collecting tanks for sands would not be required, which means a saving in capital and working costs. If solution were used instead of water, the design of plants would have to be such that the loss of solution would be reduced to a minimum. It is doubtful whether the required minimum loss of solution could be attained. On this account it is possible that the use of solution in place of water in the tube mills would not be available. This is the one reason which leads me to doubt whether solution would have an advantage over water if introduced at the tube mills. Other forms of coarse grinder than rolls may be found more satisfactorily, especially if made in large units. The merits of the various types of grinders could be considered to meet the circumstances of each particular position.

Labour Saving Underground.

While efforts are being made to make surface plants more efficient and economical, underground operations are also receiving serious attention. This branch is somewhat beyond my scope, but generally speaking it appears to me that if labour-saving is possible anywhere it is in underground operations that the greatest reduction in cost could be shown. With the introduction of electric and petrol driven underground haulages, electric hoists, pumps, etc., the presence of electrical and mechanical engineers will be required underground more than has been usual in the past, and will be one means of making them familiar with the actual working conditions there, and will, I hope, act as an incentive to improved mechanical and electrical ideas underground, and thus reduce the amount of unskilled labour required. With the increased depth of the mines and the still greater depth to which many have yet to be sunk, the balance between recovery and working costs will have to be modified to a certain extent before working low grade proposition at great depths can be made to pay. Many of the ideas expressed by Mr. Calder and other members in papers read before the institution may yet be realised.

The Two Industries.

Continuing, the speaker said that in South African politics there appeared to be certain members of the Union Parliament who were sympathetic towards the farming industry but antagonistic to the mining industry, and vice versa. Those who considered one industry only, without taking account of the other, were making a serious mistake. What would become of the Transvaal, or for that matter, of South Africa, without the mines It should be the object of members to work for the combined benefit of these two important industries, and to do so with an unbiassed mind for the good of the country. Practically all the foodstuffs used on the mines for feeding the native could be produced in the country, and, with Government's assistance, at a lower cost than ruled at present, and with profit to the farmers. Such an action would not only benefit the farmers, but also the mining industry by reducing the working costs to some degree. One often heard farmers complaining of an insufficiency of labour. Could the Government do something to assist the farmers, especially the small farmers, by reducing the labour requirements on the farms? He thought that could be done by inaugurating a special department under the Minister of Agriculture, that department to have branches in the biggest farming disricts, each branch to be equipped with the latest and most efficient farming implements and portable traction machinery obtainable. The Government to employ an efficient staff to operate the machines and advise the farmers. The services of such machinery to be hired by the farmers at rates so as to enable that department to be self-supporting. If the costs could not be kept low enough to do this, the rates should be at a minimum in order to be within the scope of the smallest farmer, even if the department be run at a loss. If farmers were to make returns of their output and profits to the Government, then some proportional rate of charge for the use of machinery could be made. Such a basis of charges would probably induce the farmers to increase their output and profits so as to enable them to be in such a financial position that they would be able to purchase their own machinery and thus be independent of Government assistance. Another good work that could be done by this same department would be the employment of a special staff of experts with up-to-date machinery to put down boreholes on the farms. This would greatly assist irrigation. It was possible that the Irrigation Department might already be doing something of this nature. The cost of such boreholes to the farmers should be kept as low as possible to be within the scope of the average farmer. Payments could be arranged to extend over a certain period.

The presentation of the Rand Mines, Ltd., award to Mr. T. P. E. Butt did not take place owing to Mr. Butt's indisposition. The president awarded a handsome set of books to Mr. Percy Perrough, whose paper gained the first prize for student members. Mr. Yule heartily complimented the recipient. Mr. A. E. Blevins read an interesting paper in reply to the discussion on "The Evolution of Printing and Type Setting Machines." Other papers were also read. A vote of thanks to the President for his inaugural address was carried with acclamation.

THE MINISTER OF MINES AND THE INDUSTRY.

A Sympathetic and Helpful Utterance—Health, Accident and Housing Questions on the Rand—The Campaign for Improved Conditions.

The first anniversary of the Government Miners' Training School at Wolhuter was celebrated on Saturday night. The celebration took the form of a concert, which was largely attended. In addition to the Minister of Mines, who delivered an address, there were present the Government Mining Engineer (Mr. R. N. Kotze), Senator W. K. Tucker, Mr. F. H. P. Creswell, M.L.A., Sir G. Albu, the Mayor of Johannesburg (Mr. J. Dowell Ellis), Mr. H. J. Hofmeyer, Mr. J. Taylor (Town Clerk), Mr. Bleksley (the superintendent of the school), Professor Orr, Dr. Van Niekerk, and representatives of various mining houses.

Reviewing the progress of the mining industry of South Africa, Mr. Malan, Minister of Mines, declared that one great stage had been passed, and that the beginning of the next must connote greatly improved conditions in regard to the health, safety, and housing of mine-workers. He put it to the many representatives of the mining industry who were present that such an institution as the Miners' Training School could have a large influence in bringing about these improved conditions, as well as advancing the employment of white miners, and appealed, on behalf of the school, for the sympathies and support of the Witwatersrand, "for which sympathy and support," he said, "we have sometimes looked in vain."

Problems of the Stable Stage.

South Africa, said Mr. Malan, could justly be proud of its gold-mining industry, which all would agree more than he'd its own as against similar industries in other parts of the world. The application of science, capital, and labour to the many difficult problems that had from time to time presented themselves had been truly colossal. To a large extent, these problems had been overcome, and, although there were still many to interest engineers, chemists, and other technical men, the industry had attained the second stage of its development—the stable stage. The industry was developing now on recognised lines, and there only remained to be discovered improved conditions of working. With the attainment of the stable stage in the development of the industry, other problems arose, different in their nature from those that had to be faced during the first stage; and he wished to draw attention to three problems which now demanded solution.

Accidents and Efficiency.

The first problem was that of the safety of the miners. One could not fail to be impressed by the number of accidents which were reported from time to time. In how far it was possible to prevent these accidents it was not for him to say, but he did feel that they would have to devote more attention to this matter unless they wished to scare off many who might otherwise be of great value and assistance to the industry. He had been devoting considerable attention to the matter. A chief inspector of mines had been appointed, and other appointments were to be made; but inspection alone could not solve the problem. The solution had to be sought in other directions as well. They wanted more efficiency, and the present conditions under which there were constant changes from one mine to another, and from one class of employment to another, as well as a rapid dwindling of the mining population due to several causes, one of which he would refer to later—all these things produced a certain amount of inefficiency. And unless they got some effect from the establishment of a Miners' Training School like that, he was afraid that they would not ultimately succeed in diminishing the fairly high rate they now had.

Inspection and Prevention of Phthisis.

The second problem was as to the health of the mines. He had had opportunities during the past week of inspecting several mines, and he had seen compounds and hospitals—especially hospitals for natives—which were really a credit to the industry; and he had reason to believe that what he had seen was a fair specimen of what was generally to be seen along the Reef. But there was the large question of miners' phthisis. He was informed that some of the difficulties the Training School had to contend with were due to the scare caused by the public discussions which had taken place on miners' phthisis. He felt that they would not attract the right class of miner unless they could say that employment in the mines was no longer so unsafe as it had been in the past. Parliament had passed an Act to deal with this question, and to provide benefits for those afflicted with the disease. The Act would come into operation on August 1, and the Board constituted under the Act would probably be gazetted in the course of the week. In that way a healthy stimulus would be given to those who were doing their best to prevent the continuance of the disease. But the Act would be of very little service, and would be a very heavy burden on the industry, unless steps were taken to prevent the disease. He hoped the Wolhuter Mine would be a model mine in this respect and be an object-lesson to the rest of the industry.

Miners' Housing Commission.

The third problem had reference to the better housing of miners. He knew that, on the whole, miners were better looked after on the Witwatersrand than in many other countries. He had been assured that that was so by a gentleman with whom he had had an opportunity of discussing the question, a gentleman who he'd a very high position and had knowledge of the industry in other parts of the world. Well, he was quite prepared to accept that, but it was not sufficient. The men lived in many cases far from their work, and there was a monotony and a want of system and care that could be avoided. He welcomed, therefore, the efforts that were being made, under the direction of Mr. Schumacher, in this matter. During the last session of Parliament also his friend, Dr. Macaulay, had asked that a Commission be appointed to go into the question. The suggestion had had his attention, and he had decided to appoint such a Commission, the constitution of which would be gazetted also probably in the course of the week. The scope of its enquiry was not to be too large, and it was to report, if possible, within two or three months, so that legislation could be undertaken on the lines of the report early next session.

The Illusion of "Kaffir's Work."

"If we solve these three problems," went on the Minister, "I think we can look forward with more confidence to the day when the idea of Mr. Creswell will be realised—the ideal of white labour in the mining industry. I appeal to the students of this school to say that they will show the way. That manual labour is Kaffir's work is a very deeply-ingrained prejudice in South Africa, and in this school some learners have had to be weeded out because they would not take to the spade and shovel. Unless we are prepared in South Africa to begin at the bottom, as people are in other countries, the white population will go to the wall and go under, and the coloured man, who is prepared to commence at the bottom, will survive." Concluding, Mr. Malan remarked that the Training School as a model for the mines ought to have the support of the leading men of the Witwatersrand. It was a new institution, and it might be open to criticism, but when it was twelve months further advanced he hoped to see more signs of sympathy and support for which in the past it had sometimes looked in vain.

Future of the School.

As far as the Government was concerned the officials of the Mines Department were working hard in the direction of solving the problems he had mentioned, and he hoped their efforts would meet with the support of the industry in general. They could do little without the direct support of the industry itself. He congratulated the men who had devoted so much care and time to the inauguration of the Training School, and he hoped that it would soon become one of the most useful and practical institutions for helping forward the great mining industry of South Africa.

High Mining Salaries

EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings; Box 2061.

FINANCES OF THE CROWN MINES.

Further Details of the Proposed Issue of £1,000,000 Five per cent. First Mortgage Debentures.

As recently announced, the Crown Mines, Limited, propose to offer for public subscription £1,000,000 five per cent. first mortgage debentures at £97 10s. per cent. In a circular to the shareholders, the secretaries (the Rand Mines, Limited) state: "At the adjourned annual meeting, held on May 23, 1912, the chairman advised that the construction programme undertaken at the time of the amalgamation was nearly complete. He stated that on completion of the programme a debt on account of capital expenditure of approximately £900,000 would have been incurred, in addition to which there would be a special suspense account of rather more than £300,000, representing the cost of advance development. The company has been financed to date by the Central Mining and Investment Corporation, Limited, and by the Rand Mines, Limited. In view, however, of the early completion of the programme of equipment and advance development, it has become necessary to consider what steps shall be taken to place the company's finances on a basis which will provide that the debt incurred shall be liquidated in such a manner, and over such a period, that profits may be available to the greatest extent possible for the payment of dividends. The issued capital of the company is £940 106, in 1,880.212 shares of 10s. each, 119.788 shares of 10s. each being held in reserve. The chief assets of the company are the mining areas and freeholds in the Witwatersrand district, equal to 2,221·8688 mining claims and 3,040 morgen 4 roods respectively, together with plant and equipment capable of treating about 2,500 000 tons of ore per annum, and mine development of over 10,000 000 tons of payable ore. Of the above claim area it is estimated that 345½ claims have been exhausted up to December 31 last. Provided the supply of native labour remains adequate, it will shortly be possible to increase the scale of the company's operations, when larger profits are expected.

"The following is the scheme which the directors have decided upon:—(1) An extraordinary general meeting of shareholders will be held on August 30, 1912, for the purpose of increasing the directors' borrowing powers. At this meeting shareholders will be asked to sanction the borrowing of up to £1,000,000 sterling, and to approve of the issue of £1,000,000 debentures in the terms following. (2) The company will, thereafter, offer for public subscription £1,000 000 five per cent. first mortgage debentures to bearer at £97 10s. per cent. in denominations of £50, £100, and £500, but preference will be given in the allotments to application from shareholders in this company and in the Rand Mines, Limited. (3) The issue will be secured by first mortgage bonds passed upon the principal properties and assets of the company. (4) Provision will be made for repayment of the debentures in Johannesburg and/or London at 103 per cent. in eleven annual instalments of £85,000 each, commencing on January 1, 1915, and a final instalment of £65,000. Debentures will be drawn for repayment annually. The company will reserve to itself the right to give three months' notice of its intention to redeem, at any time, any amount over and above the stipulated drawings of £85.000, but any such repayment will be made at the rate of 105 per cent. The company will also have the right to purchase debentures in the open market at or below 103 per cent., plus accrued interest. (5) A provisional agreement has been entered into by the Central Mining and Investment Corporation, Limited, and the Rand Mines, Limited, with the company, securing the underwriting of the issue at 97½ per cent. for a commission of 3 per cent. on the nominal value of the issue. The proceeds of the issue outlined above will suffice to liquidate the company's indebtedness on account of capital expenditure. The cost of advance development will be gradually extinguished. It represents about 1s. per ton on the net increase in the ore reserves since the amalgamation. The payable ore reserves at the close of last year amounted to 10,124,000 tons, of an average assay value of 7·25 dwt."

Messina Copper.

The official report of the June operations of the Messina (Transvaal) Development Company, Ltd., states: The mill ran 12 days and treated 894 tons of ore obtained from development. The output of concentrates for shipment was 130·41 tons, average assay value 49·2 per cent. copper, and 51 tons of middlings assaying 19·5 per cent. copper were also produced. 779 feet of development was accomplished. A new hauling shaft (No. 5) was started, parallel to No. 4 shaft, and was sunk 19 feet from surface. The middle lode, 4th level, east drive, was advanced 57 feet. For 25 feet the average assay value was 5·1 per cent. copper over 60 inches. The north lode, 4th level, east drive, was advanced 59 feet. A crosscut from the drive exposed the ore-body containing high-grade copper glance, assaying 20 per cent. copper for a width of 10 feet. The hanging-wall winze was sunk from 85 feet to 100 feet in solid ore, assaying 18·5 per cent. copper over 60 inches. The 5th level crosscut from hanging-wall to foot-wall of Bonanza lode exposed a solid ore-body 75 feet in width, average assay value 19·5 per cent. copper. The foot-wall drive east for 5 feet assayed 25·7 per cent. copper over 60 inches. The crosscut 2 N, through lode on foot-wall assayed 28·5 per cent. copper for a width of 60 inches. The foot-wall drive west assayed 20·7 per cent. copper over 60 inches for a distance of 5 feet. 6th level. N 2 W. winze to 40 feet assayed 16·9 per cent. copper over 60 inches. No. 3 W. winze to 61 feet assayed 13·8 per cent. copper over 60 inches. The 8th level east drive on foot-wall was advanced 57 feet. From 35 feet to 55 feet, average assay value 14·6 per cent. over 60 inches exposed. New workshops have been erected and equipped with tools and appliances. Extensions to boiler-house and powerhouse were completed. An order has been placed for an additional 250 h.p. boiler and 250 k.w. steam generating set, motors, etc. An order has also been placed with Messrs. Fraser & Chalmers, Ltd., for additional concentrating plant to have a daily capacity to treat 250 tons of ore. All work at surface and underground is being pushed forward to provide for a large output of copper in anticipation of railway connection with the mine early next year.

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Minimum Maintenance Costs, Highest Efficiency, Unrivalled Accessibility to all parts and Flexibility in raising tailings to any height.
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TRANSVAAL CHAMBER OF MINES' MONTHLY REPORT.

Labour, Phthisis and Recruiting Questions.

The report of the Executive Committee for June states, *inter alia* :—During June the disbursements amounted to £3,719 1s. 3d. (including £2,363 7s. 4d. handed to Transvaal Miners' Phthisis Sanatorium) and the receipts to £310 2s. 8d. The balance to credit of current account on 30th June was £2,688 17s. 6d. The sum of £15,000 remains on fixed deposit. Native Labour.—The returns supplied by the Witwatersrand Native Labour Association, Limited, show the following results for the month of June :—Number of natives employed by members of the Association on last day of month (including natives in the service of mine contractors, but excluding natives in the employ of members of the Association in the districts of Barberton, Breyten, Rooiberg and Louis Moore :—On gold mines : May, 193,829 ; June, 188,494. On coal mines : May, 8,460 ; June, 8,549. On diamond mines : May, 14,538 ; June, 15,530. Totals—May, 216,827 ; June, 212,573. Recruiting results.—The Witwatersrand Native Labour Association also furnishes the following information with regard to the natives recruited by the Association and its members during the month of June, 1912, and the districts whence they were obtained. These figures for the month of May are given for the purpose of comparison :—East Coast—South of latitude 22° S. : May, 2,493 ; June, 2,250. East Coast—North of latitude 22° S. : Nil. Cape Province : May, 2,819 ; June, 4,126. Transvaal Province : May, 663 ; June, 1,031. Basutoland and Orange Free State Province : May, 1,055 ; June, 1,224. Bechuanaland : May, 236 ; June, 229 ; Natal Province : May, 450 ; June, 1,262. Swaziland : May, 252 ; June, 942. Rhodesia (including via Pietersburg) : May, 128 ; June, 229. Local : May, 7,726 ; June, 6,616. Totals—May, 15,822 ; June, 17,909. Natives employed in Labour Districts of Transvaal.—The monthly report issued by the Department of Native Affairs shows that at the 31st May, 1912, 322,062 natives were employed in labour districts of the Transvaal. Of this number, 229,406 were engaged on mines on the various classes of works specified in Part I. of the Coloured Labourers' Health Regulations, 1906, and 92,656 were in other employ. Miners' Phthisis Act, 1912.—Since the date of the last General Meeting of the Chamber the above-named Act has received the assent of the Governor-General, and will come into operation on August 1st, 1912. The Act provides for two funds for compensation to miners as defined under Section I. The first fund, called the "Miners' Phthisis Compensation Fund," will make payment of benefits to applicants entitled thereto within a period of two years immediately succeeding the commencement of the Act, or to persons to whom allowances have been granted under the Miners' Phthisis Allowances Act, or to persons to whom allowances have been granted under the Miners' Phthisis Allowances Act, No. 34 of 1911. The amount required for meeting the claims under this fund will be provided by the employers by levies made every three months, assessed in proportion to the average number of miners employed per month during the three years immediately preceding each such period of three months, or the portion of such three years during which there was production or development on the mine. The sum of £100,000 is provided by the Government to be paid to the fund by appropriation of Parliament during the financial year ending March 31, 1913. Sub-Section (2) of Clause 7 of the Act provides that a separate account shall be kept of the Government contribution of £100,000, and the Board shall from time to time draw therefrom such amount as may be necessary to make up the difference, if any, between the amount of the contribution which would have been payable by any mine, and the average quarterly profit earned by that mine during its previous financial year. The second fund, called the "Miners' Phthisis Insurance Fund," provides for payment of benefits to claimants entitled thereto "who make application therefor at any time after the expiration of the period of two years immediately succeeding the commencement of the Act." The fund is to be built up in the following manner. For the first two years after the commencement of the Act the employer is to pay an amount equal to 5 per cent. of the earnings of every person employed underground as a miner. After the expiration of the said period of two years an amount equal to 7½ per cent. of such earnings is to be paid. The employer shall, in each case, be entitled to deduct 2½ per cent. from the wages of each such miner. Both funds will be vested in and administered by a Board to be appointed by the Minister of Mines. The benefits to be awarded under the Act are laid down in Section 21, and are those mentioned in the last monthly report of your Executive Committee, with the addition that the dependants of miners, who have been proved to the satisfaction of the Board to have died of miners' phthisis, before the coming into operation of this Act, or of Act No. 34 of 1911, may apply for the benefits under the Act. Native mine labourers contracting miners' phthisis are entitled to obtain the sums provided for in Section 22 of the Native Labour Regulation Act of 1911, to be assessed by the Director of Native Labour. Local Government Ordinance.—The Draft Ordinance of the Provincial Council "to consolidate and amend the Law relating to Municipal Government in the Transvaal Province and the establishment of Health Committees therein, and to provide for matters incidental thereto," which was published in a "Provincial Gazette Extraordinary" of February 19th, is receiving the consideration of a Sub-Committee of your Executive Committee, and representations are being made in respect of points affecting the mining industry. Municipal Elections Ordinance.—This Draft Ordinance of the Provincial Council, which was published in a "Provincial Gazette Extraordinary" of April 3rd, contains (*inter alia*) a provision in Section 9 defining "the gross annual value" of property as being "the gross annual rent paid by the occupier for the premises" instead of as in the existing Ordinance the gross annual rent which a valuer would estimate that the premises would fetch if let. Your Executive Committee understands that this Bill may be referred to a Select Committee. Representation.—The following change in representation has taken place :—Luipaards Vlei Estate and G.M. Co., Ltd., Mr. W. P. Taylor *vice* Mr. T. Douglas.

Rand Mutual Assurance Annual Meeting.

RETIREMENT OF MR. A. WAGNER.

The annual meeting of the Rand Mutual Assurance Co. was held yesterday week in the Boardroom of the Premier Diamond Co., Cullinan Buildings. Mr. Adolf Wagner presided. The report and accounts were adopted. The representation was £76,280 out of a capital of £82,000. Mr. R. W. Schumacher said that although no official notification had as yet been made, a number of them understood that their chairman, Mr. Wagner, intended shortly to resign his position as chairman of the company, and to vacate his seat on the Board. Mr. Wagner was one of the original directors of the company, and actually signed as acting chairman the minutes of the first directors' meeting, held on May 4, 1894, eighteen years ago. He had been chairman of the company since July, 1904. The company commenced operations on June 1, 1894, with a capital of £3,830, of which £1,915 was paid up, and the only shareholders were the Simmer and Jack Proprietary Mines, Ltd., the Geldenhuis Estate, and the Jumpers Company. Eleven other companies became members during the first year. The growth of the company was reflected by comparing these figures with those given in the annual accounts placed before them that day. They would see from the directors' report that since its inception the company had paid £536,528 in claims. The position was that they had their capital of £82,000 intact, and two reserve funds of £4,600 and £8,930, all represented by sound investments. As all knew who had been closely associated with the business of this company, the strong position in which it found itself to-day was due in a great measure to the active interest taken in it by Mr. Wagner. They could not allow that meeting to close without recording the appreciation which they all felt (he knew that he was not speaking for his firm alone) in regard to Mr. Wagner's splendid work. There had been much constructive work to do, not only in the early days, but throughout right up to the present time, and the affairs of the company had been skilfully steered to success with Mr. Wagner at the helm. While expressing their regret and his personal regret that Mr. Wagner was about to sever his connection with the company, he begged to propose a very hearty vote of thanks for all that he had done.

Mr. Wagner, in reply, said he was grateful for the words of appreciation expressed by Mr. Schumacher. His connection with the company had always been a pleasant one, and he had thoroughly appreciated the confidence the controlling directors of the gold mining industry had placed in him, and their reliance on his judgment. His sole reason for leaving was because he found he could not give the increasing time and attention the ever growing business of the company demanded, but the company's future career would always be followed by him with the deepest interest, and he wished it every success.

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Young man (age 22) who has served as Cyanide Tanksman, also in Battery, and as a Pumpsman, seeks Situation on Reef or Outside Mine. Strong and energetic ; not afraid of hard work. Good references.

Apply "CYANIDE," c/o this office.

Rhodesian Section.

LATEST FROM THE MINES.

New Ordinances Promulgated—Latest from the Bushtick—New Found Out and Agnes—Progress at the Antelope and Lonely.

The new Rhodesian "Native Labour Regulations Ordinance, 1911"—officially described as a measure "to regulate the recruiting and employment of natives within Southern Rhodesia, and for controlling the removal of natives for employment beyond its borders"—has been promulgated. The measure is a consolidation of three Ordinances passed respectively in 1899, 1907, and 1911, and provides for the regulation of the licences to be issued to recruiters, conductors, compound managers, etc.; of the form and matter of the contracts that may be entered into; of desertions, and of refusals to obey the lawful commands of employers; and of the appointment by the Government of inspectors, whose duty it shall be to enquire into and, if possible, to redress grievances complained of by native labourers. Under the last section, "general and miscellaneous," the Administrator may make regulations consistent with the Ordinance upon a variety of subjects ranging from the manner and form of the issue of permits and licences and their inspection, to the attestation of contracts, repatriation, medical examinations, housing, etc. Special regulations are now published for general information, framed under the provisions of the Native Labour Regulations Ordinance, which are accompanied by a number of annexures, these latter indicating the form and wording required in regard to the various licences and permits.

* * * *

The new tube mill plant on the Bushtick came into operation during the last few days of June, since when crushing has been most satisfactory. During the present month extensive alterations are being undertaken on the 20-stamp mill, after completion of which a duty of 12 tons per stamp per diem is expected. Of late months all amalgamation has perforce been dispensed with, but now new blanket tables have been put into commission, and are giving excellent results. Development on a large scale has been inaugurated in the Warwick section of the mine, 364ft. being attained during the month of June, while the Hollins section of the mine is now being de-watered, and when completed, extensive development will be proceeded with there.

* * * *

The consulting engineer to the New Found Out Mines, Ltd. (Mr. Gordon Dickson), cabled to the Board in London in mail week as follows:—"Cross-cut east north drive No. 7 level, fault has been passed through, struck good ore, continues north so far 32in., not through reef yet; assays later."

* * * *

The Board of the Charter Trust and Agency issued their report in mail week. This stated that they had resolved that dividends be paid for the half-year to May 31, 1912, on the preference stock at the rate of 5 per cent. per annum, and on the ordinary stock at the rate of 7½ per cent. per annum, payable, less income tax, on July 8.

* * * *

The Agnes mine, owned by Mr. P. S. Triggs, and situated about two miles from Gatooma, is being developed. A new 5-stamp battery has lately been erected, but although there is a considerable amount of ore at grass, further development is deemed advisable before crushing operations are commenced.

* * * *

Empress-Palmeiro Mine cable: "Power drills—Started the machinery on May 31st: everything working well. In winze No. 1 north (west reef) below the 220ft. level from 9ft. to 12ft. the assay value over 6 by 4 face is 5½ dwts. per ton—regard this as most important. The north drive White Wings intermediate shaft from 18ft. to 21ft., 7 dwts. per ton; at 24ft. 3 dwts. per ton; at 27ft. 4½ dwts. per ton; at 30ft. 5 dwts per ton."

* * * *

Development at the Lonely Reef in May continued to show remarkably good results from the 8th level. At the end of April the level had been driven 15ft. north and 35ft. south, showing an average of 1 oz. 17 dwts. over 45·5in. for the whole length. During May the north drive was extended to 85ft., showing an average of 2 ozs. 12 dwts. 18 grs. over 40·57in. The south drive, from 35ft. to 50ft., averaged 1 oz 12 dwts. 7 grs. over 53·66in. No sample was taken at 55ft. as a rise (No. 1) was being put up at this point, but from 60ft. to 65ft. the reef was 47in. wide, assaying 3 ozs. 11·3 dwts. So far, therefore, there is 150ft. of pay ore of over 2 ozs. on this level, and as the pay ore extends over 700ft., averaging over 30 dwts. on the level above, there is already evidence of a considerable tonnage between the 7th and 8th levels. The main shaft at June 11 was down 86ft. below the 8th level.

* * * *

From the director's report of the Antelope for the quarter ended March 31st:—Development work has been chiefly devoted to the lower levels of the mine, more particularly to the sixth, seventh, eighth, and to winzes to the ninth level. The reef has been picked up below the dyke in the G1 winze at a depth of 100ft. (eighth to ninth level), and from 100ft. to 132ft. (ninth level); the average width and values were:—Average width exposed, 2ft. 2·3in.; average assay value, 15¼ dwts. A winze, G2, has also been sunk 203ft. east of G1 winze to a depth of 74ft., the average width and assay value for that distance being:—average width exposed, 3ft. 2in.; average assay value, 16 dwts. The sinking of the main shaft was recommended during March, and had attained a depth of 838ft. at the end of the month. Tonnage developed:—The main reef ore reserves during the quarter were increased by 12,249 tons, of an assay value of 9½ dwts. per ton, and the total ore developed at March 31st last was:—Main reef, 114,851 tons; value 10·1 dwts. Eastern section, 6,217 tons; value 8·3 dwts. South parallel reef, 14,201 tons; value, 5·8 dwts. Reduction plant:—Plans and specifications for a reduction plant, having a capacity of 4,000 tons per month, have been prepared.

Bucks Reef: June Returns.

The following are particulars of last month's working results, viz.: Tons crushed, 843; yield, £3,005 8s. 1d.; profit, £1,098 16s. 9d.

OUTLOOK FOR THE SHAMVA.

Points from Annual Report—Plant Ordered—Development Returns.

The report of the Shamva is in issue, and the meeting will be held on Wednesday, July 3. The issued capital of the company is 500,000 shares, and 100,000 £1 shares remain in reserve for future issue. In the fifteen months to March 31, 1912. 1,072,746 tons, of an average value of 6·17 dwt., were added to 1,019,113 tons, assaying 3·72 dwt., at the end of 1910; consequently the total reserves at the end of March were brought up to 2,091,859 tons, of an average value of 4·97 dwt. The recapitulation of the development work done is given in Mr. Piper's report. At the Prospect level, and at the 1st, 2nd, and 3rd levels, the showings are given as under:—

	Length of Strike exposed. Ft.	Average Width. Ft.	Average Value. Dwts.
Prospect level	740	88	3·8
1st level	920	110	4·14
2nd level	820	97	6·77
3rd level	360	29	5·43

In respect of the 3rd level, where first encountered at No. 3 adit, the width was five feet. The No. 1 cross-cut north widened to 15 feet, No. 2 cross-cut to 30 feet, and No. 3 cross-cut to 65 feet. The values improved from 4 dwt. where first cut to 18·9 dwt. for the first five feet driven at No. 4 cross-cut north. A start in attacking the 4th level has been made by the main adit, which has been carried for a distance of 306 feet into the hill. The detail of the ore reserves as to tonnage exposed at the different levels shows:—

	Tons Exposed.	Average Value per Ton. Dwt.
Prospect level	296,659	3·77
1st level	738,853	3·71
2nd level	787,607	5·78
3rd level	268,740	7·44
Total and average ...	2,091,859	4·97

Preparations have been made for stoping, so that supplies required for the plant that has been ordered will be readily obtainable as soon as the plant is started. Dependent on construction of the railway, the plant is expected to be ready in the second half of 1913. The plant ordered will have a capacity of crushing about 40,000 to 50,000 tons per month. The company has obtained a site on the Inyagui River, whence a plentiful supply of water for all purposes can be readily obtained all the year round. Pending arrival of the plant, a considerable amount of excavation work has been done. The balance sheet as at December 31, 1911, shows the company had cash in hand to the amount of a little over £290.000. The issued 500.000 shares at price 3½ equals £1.750,000. The profit available for dividend to give 7 per cent. income to the investor must be £122,500 on the market capitalisation.

THE YEAR WITH MATABELE QUEENS.

Large Amount of Development Work—Encouraging Results.

The directors report of the Matabele Queen's for the period from the registration of the company, November 12, 1910, to December 31, 1911, that the profit for the period covered by the accounts, after providing for depreciation and income-tax, amounted to £10,003, which it is proposed to carry forward. A large amount of development work has been accomplished since the property was taken over by the company, the total footage for the period under review amounting to 5,193 feet, the policy being to open up the mine as quickly as possible, with a view to adding to the ore reserves and increasing the reduction plant capacity as soon as justified. During the period under review 25,115 tons of ore reserve were developed, while 15,311 tons were treated, leaving a balance on hand at December 31 of 21,310 tons of an average estimated value of 51s. 6d. per ton. In addition to these ore reserves there are some 28,000 tons of accumulated slimes, of an estimated value of 15s. per ton. The following footage in driving and sinking was completed to December 31, 1911:—Driving, 3,126 ft.; sinking, 961 ft. The total lengths of pay shute exposed at the various levels at April 30 last were as follow:—No. 1 level: Total length, 850; average width, 47 in.; average assay, 42s. 6d. No. 2 level: Total length, 1.309; average width, 37 in.; average assay, 56s. 2d. No. 3 level: Total length, 1.095; average width, 33 in.; average assay, 54s. 9d. *No. 4 level: Total length, 570; average width, 28 in.; average assay, 42s. 10d. *Pay shute still continuing in face of drive. At the end of the year the new main shaft, called the Czarina, located 1,000 feet west of the old main shaft, was sunk to a depth of 360 feet, and connected with the 2nd and 3rd levels. During the present year this shaft has been continued, and is now down to the 5th level at 563 feet from the surface. Arrangements are now being made for all hoisting to be effected through this shaft, and work at the old main shaft will then be stopped. By this means a considerable economy in working should be effected. A slimes plant, capable of treating 2 000 tons per month, has recently been installed. As invariably is the case with any new plant, alterations and improvements are now being made, and it is anticipated that these will take a few more weeks to complete before the plant can be in efficient working order and the full benefit derived therefrom, when a material improvement in yield and proportionate increase of profits may be expected. The amount spent on capital account during the year was £15 827. A considerable amount of exploration work has been undertaken to the east of the fault, which at one time was believed to be the eastern limit of the mine. The results have been encouraging, in so far as that pay values have been exposed in this section, and the outlook is promising, but further work must be undertaken in this direction before a definite opinion as to its value can be formed.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Health on the Mines.

WHY THE FLY AND MOSQUITO MUST BE EXTERMINATED.

To the Editor, *South African Mining Journal.*

Sir,—It is to be regretted that more interest is not taken in the gospel which the South African Anti-Malarial Association has been established to propagate. At the annual meeting held last week there were scarcely enough present to form a quorum. Perhaps the name gives the impression to the average inhabitant of the Rand and of the high veld that he is not directly concerned with the object which the Association has in view. That is a mistake. It is true that we have little to fear from malaria-carrying mosquitoes, but we have a great deal to fear from flies which spread diseases that are probably as bad as, or even worse than, malaria. The recent history of the Panama Canal conveys a most valuable lesson on this point—a lesson which, unfortunately, even medical men have not yet fully appreciated. The Panama Canal zone, once a death trap, is to-day one of the safest places to live in in the whole world. This wonderful result has been achieved by making the Canal zone fly-less as well as mosquito-less. I have prepared some tables as regards the employees of the Panama Canal and those of the mines of the Transvaal, and which, I think, will be found instructive:—

Death-rate on the Panama Canal of White Employees from the United States and their families.

Year.	White Women and Children from the United States. Number.	 Death Rate from Disease. % per ann.	White Employees and their Families from the United States. Number.	 Death Ra e from Disease % per ann.
1908	2,674	7·85	8,133	5·16
1909	3,240	4·32	8,386	4·05
1910	4,097	5·13	10,176	3·64
1911	4,464	6·72	10,489	4·48

Death-rate per Thousand per Annum from Disease.

	Panama Canal.		Transvaal Mines
	Number Employed.	Death Rate per 1,000.	Death Rate per 1,000.
WHITES.			
1906	4,929	13·35	12·33
1907	10,701	10·92	12·23
1908	12,384	7·27	13·91
1909	11,662	6·43	12·29
1910	13,021	4·92	11·43
1911	12,251	5·88	12·89
BLACKS.			
1906	21,618	45·97	29·10
1907	28,537	29·58	27·35
1908	31,507	9·24	29·08
1909	35,505	7·91	27·58
1910	37,781	8·39	29·74
1911	36,625	8·25	28·85

Causes of Death from Disease in Percentages of the Total Mortality from Disease.

	Negro Employees on the Panama Canal. 1906.	Native Employees of Transvaal Mines. 1911.
Pneumonia	40·4	46·8
Typhoid and Dysentery...	10·6	9·4
Tuberculosis	4·1	20·3
Meningitis	2·5	7·1
Malaria	22·5	·4
Other Diseases	19·9	16·0
	100·0	100·0

On the above tables I submit the following observations: In the Panama they started with a campaign against the mosquito, coupled with general sanitary reform, but the main aim was to destroy the breeding places of the mosquito. By this means they got rid of the yellow fever in 1905. It appears, however, that they were not making much headway as far as diseases other than yellow fever and malaria were concerned. Even in 1906 and 1907 the mortality among the negro workers on the Canal was higher than among natives on the mines in the Transvaal. And it will be observed from Table 3 that with them, as with us, pneumonia was responsible for more deaths than any other disease. They improved their hygienic measures and by 1908 they had made it as difficult for the fly as for the mosquito to spread disease. The results are most remarkable. The death-rate of the negro employees, which was 29·58 per thousand per annum, in 1907, dropped to 9·24 per thousand per annum in 1908, below which figure it has since remained. The death-rate from pneumonia among the negro employees on the Panama Canal was 18·46 per thousand per annum in 1906 and 2·3 per thousand last year. Among the natives employed by the members of the Witwatersrand Native Labour Association the death-rate from pneumonia has gone up from 11·2 per thousand per annum in 1906 and 1907 to 14·5 per thousand per annum in 1910 and 13·9 last year. As far as I know, the main thing that has been done in the Panama and not generally done here is that hospitals, kitchens, dwellings, sanitary buildings, etc., have been made absolutely fly-proof, and the breeding-places of flies have been systematically eliminated.—Yours, etc.,

SAMUEL EVANS.

Johannesburg, July 5.

Rand Geology.

To the Editor, *South African Mining Journal.*

Sir,—Your correspondent who adopted our King's monogram, or, to be more correct, his " abbreviatic," in your last issue, is evidently a credulous disciple of Dr. Hatch, but if a disciple why does he refrain from signing his precious name to his epistle? I am very proud of his remark that " I have argued for years that the Van Ryn is distinct from Main Reef series, and that I do not identify it with Du Preez." It stands to common sense that it is better for the life of the Rand, and the surrounding country to have three payable series in place of one which is all the other geologists allow it, viz., Main Reef series, reduced now to " the " Reef at company meetings, to represent " unificalie." Thereby giving the world the impression that we have only one string to our bow, instead of many, as there really are in the Black Reef age, and this age, which are inseparable in places, and both the same in the eyes of the Geological Society, from whence all theories flow. Thank goodness I stand alone on my sheaf of accumulated stratigraphical facts, with the motto: " While I live I'll crow "—which all the Alexanders know. As far as the " continuity " of the Van Ryn, and the Du Preez series are concerned they are absolutely continuous—bar dykes, faults, throws, etc.—and wherever they appear, in no matter what district, or what trend or dip, they are never less than 400 yards apart; although, if you are lucky in finding one of them outcropping, it does not follow in every case that it is an easy matter to come across the other in the same field, as it may have "gone to earth" a mile away, for they are both slippery customers and only too ready to bang off anywhere on their own account at the word "go" from Nature. Mr. Bleloch makes them one and the same series at Jeppes because I think he thinks largely, and steps along quickly over country; hence a space of four or five hundred yards, which took some little time to construct layer by layer, is as nothing to him; but he forgets in his haste that the many shale beds which separate them may deceive him at any time, re distance along the strike, where the fanning out of the country has taken place east and west of the town, just as an eagle spreads its wings in flight. There is sense in my simile, and some day I will endeavour to explain how Nature acts similarly with its series of the ages, be they Schistose, Lydenburg, Witwatersrand or Black Reef. Mr. Bleloch is quite able, I should imagine, to defend himself as far as his new company is concerned, by whatever name he calls, it, and I can say positively that he has both the Van Ryn and Du Preez series in the property, together with several square miles of Black Reef series, which in my opinion is as good as the average Main Reef series, and sometimes bettor than the best of it. So much so that many mine managers are working the one for the other, not knowing the difference, great as it is, yet if you offered them margarine for butter I expect they would, although it is out of their line. Dr. Hatch's book, which is continually quoted regarding the stratigraphy of the Rand, is, in my humble opinion destructive geology in this respect, as he makes the Van Ryn, Blue Sky, and Black Reef, "the" Reef, and Du Preez an orphan. "G. R." talks of bore holes and shafts, out East, which have proved the correctness of Dr. Hatch's theories, but who has ever heard of Main Reef lying on ferruginous shale, or any other kind for the matter of that? Most of the bore holes I have seen described, and many shafts too, have read to me right away "Black Reef series." Another great argument in favour of his Main Reef on the far East is that you can get down from the Kimberley series out there to Main Reef in the short space of 1,500 feet or so, whereas here on the Central Rand I affirm it will take 5,000 feet even if the beds were horizontal, which no Main Reef series ever is anywhere in the Transvaal, to please any one. Again, he talks of the Kimberley shales, whereas there are no such things as Kimberley shales. The Cinderella Deep reefs at the mouth of the shaft, according to Dr. Hatch, and others, are of the Kimberley series, whereas, as a matter of fact, it is Bird Reef series, which only happens to be 1,000 yards nearer to Main Reef series. Compared to Mr. Bleloch's error of the 400 yards to unite Van Ryn and Du Preez, the former is a grevious error, adding nothing, but subtracting a series which is not to be despised, and 3,000 feet of quartzites into the bargain. Dr. Hatch's thin red line, representing Main Reef series in his books, has lead Dr. Mellor into a "cul-de-sac" out West, and I am amusing myself wondering how his friends are going to help him out of it, as he has gone too far to turn back. All that I can suggest is the "duplicatic," and "triplicatic" theory, but it is a dangerous one to handle, as it can so easily be burst by one who knows how.—I am, etc.,

SCOTT ALEXANDER,
"Rand Stratigraphist."

Johannesburg, July 16th.

Randfontein Central.

An accident occurred in the shaft on No. 3 section of the southern division of the Randfontein Central, and haulage had to be suspended for 15 days. The damaged shaft has been repaired, and everything now is running smoothly.

Ancient Gold Workings.

In the course of an interesting paper on "Old Workings" in the Northern Transvaal and Rhodesia, read by Mr. F. E. B. Fripp before a meeting of the Rhodesia Scientific Association at Bulawayo, the lecturer referred to the various difficulties that must have been encountered by the ancients, making continuance impossible. Even slight dislocations or interruptions in the pay shute would be sufficient to impede the purely empirical kind of mining of which they were capable. Apart from such changes in the reef there were what might be called mechanical difficulties in the way of ventilation, not only for the workers themselves, but for the fires with which they roasted the rock. Further, there was the caving of stopes and the question of water. These difficulties precluded work from being carried on at a depth much below 200 feet. Mr. Fripp then explained the characteristics of the old workings of the West Nicholson, the Olympus, and the Geelong mines. Water would seem to have been the determining factor in limiting the work of the ancients, he said. The number of mortar holes invariably found in the rock near the outcrops, which he described, showed plainly that they had been made for the purpose of treating the roasted rock for gold.

Exploring Land and Minerals.

Originally formed in 1894, this well-known Rhodesian enterprise has passed through two reconstructions, the present capital being £375,000 in 5s. shares, of which 1,080,939 shares have been issued. The properties owned comprise about 950 square miles of farm lands in Salisbury, Umtali, Victoria, Charter, Sabi, and Makini districts, with right to one-half of any townships established on land pegged under grant; 15 stands Bulawayo; 40 stands, market concession, and office blocks Salisbury; 11 stands Umtali; 15 stands Victoria; surface and mineral rights over 65 square miles; 45 mining claims in Mazoe and Hartley districts, besides numerous other assets. For 15 months to end of 1910 there was a profit of £1,385, and the cash assets on December 31st, 1910, were £71,383. The directors have now issued their report and accounts for 1911. From this we learn that the liquid assets on 17th inst. were as follows:—Cash at banks, £12,557; cash on loans against security, £55,084; debentures and shares immediately realisable, £16,863. The more important holdings include Crown Mines, Ferreira Deep, East Rand, Witwatersrand Gold and Deep. During the year a considerable amount of prospecting and development was carried out on the company's Rhodesian properties. Several encouraging discoveries were made, but in the main values failed to continue in depth. During the period under review the Lesapi Flat farm of about 3,290 acres has been sold at a good profit, and since December 31st, 1911, the M'Bobo Flat and Marngu farms of about 8,900 acres have also been disposed of on satisfactory terms. Land in Rhodesia has advanced in value since the date of the last report, and the directors look upon it as a steadily improving asset.

The Public Works Department, Pretoria, has accepted the following tenders: Templar Bros., Box 164, Johannesburg, £1,036, additions to Troyeville Junior School; S. Norris, Box 4, Carolina, £850, erection of teachers' quarters, Leeuwfontein No. 316, Middelburg; S. Norris, Box 4, Carolina, £1,425, erection of school and quarters at Boschmanskranz No. 156, Middelburg; James Lillico, Box 2,200, Johannesburg, £9,450, erection of new school at Fordsburg; R. Maxwell, Box 202, Pretoria, £883, erection of school at Haartebeestspruit No. 572, Pretoria District; Proudfoot and Co., Box 2569, Johannesburg, £1,316 1s. 2d., erection of bridge over the Klein Yokeski River, Boschkop; Fairbairn and Wilson, Box 87, Ermelo, £1,849, erection of school and quarters at Driefontein No. 235, Middelburg; Patterson Bros., Box 2643, Johannesburg, £865, erection of teachers' quarters at Vischgat No. 318, Heidelberg; E. G. Rowe, Box 62, Middelburg, £699, erection of teachers' quarters at Tonteldoos, Middelburg; E. G. Rowe, Box 62, Middelburg, £675, erection of teachers' quarters at Valliespruit No. 464, Lydenburg; E. G. Rowe, Box 62, Middelburg, £636 10s., erection of teachers' quarters at Tweefontein No. 236, Middelburg; E. G. Rowe, Box 62, Middelburg, £1,480, erection of school and quarters at Boschfontein No. 1064, Lydenburg (north).

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

THE WEEK IN THE SHAREMARKET.

Still Waiting on London—End of Depression in Sight?

There is a prospect, according to latest London advices, that the end of the depression is in sight. On this side we confidently hope it is. Any effect on the market, however, is still to seek, and we wait in vain for some tangible sign of coming activity. The week has been satisfactory from every point of view—and the visit of the Minister of Mines should have a good effect. Nothing has done more harm to the market that Mr. Hull's abortive taxation proposals, and shareholders fear they may be followed by others, no less serious. The official confirmation of the labour agreement is bound to have a good effect; and when London realizes its significance things ought to go better. It may be, of course, that time is required to restore confidence on the other side, but against this we have the most praiseworthy and tireless efforts of the people here to secure economies.

* * * *

Mail week in London was fruitful of rumours. It began with a sharp drop in Cape Coppers on a cable from the superintendent announcing a serious fall of ground in the Ookiep mine, from which the high-grade ore comes, and it ended with a sharp rise in Cam and Motors on mail advices reporting that the last two crosscuts at the 5th level have exposed a substantial width of payable ore; and in Giants, on a cable from the consulting engineer stating that Dr. Corstorphine endorses the official view that the encountering of the acid dyke and mineralised matter in No. 3 and 7 boreholes can be regarded as "most satisfactory." In between, Bucks Reef have done some see-sawing, in sympathy with revived rumours as to the lost reef having been recovered, and Tanks were one time stronger and again weaker.

* * * *

	Friday, 12th.	Sat., 13th	Monday, 15th.	Tuesday, 16th.	Wed., 17th.	Thurs. 18th.
African Farms ...	14 6B	14 6B	14 6B	14 6B	14 6B	14 6B
Adair-Usher Process	...	1 6S	1 6S	...	1 6S	...
Apex Mines ...	26 3B	27 0B	27 0B	28 0B	30 0	30 0B
Bantjes Consolidated	21 0B	21 0B	21 3B	21 0B	21 9B	21 0B
Benonis	4 6B	4 6B	4 6B	4 9	5 0B	4 9S
Bushveld Tins ...	1 0B	1 0B	1 3S	1 3S	1 1B	1 3S
Brakpan Mines ...	72 0B	72 0B	72 6B	73 0B	73 0B	73 0B
Blaauwbosch ...	20 0B	20 0B	20 0B	20 0B	...	...
British S A. ...	...	...	...	...	23 6B	...
City and Suburban ...	46 0B	46 0B	46 3S	43 3B	46 3B	46 3S
City Deeps	56 0S	56 0S	55 0B	56 0B	56 0B	...
Cloverfield Mines ...	5 0B	5 0B	...	...	5 1	5 0B
Cons. Langlaagtes ...	21 9B	21 9B	21 9B	22 6	22 3B	22 0B
Cons. Main Reefs ...	18 6B	18 9	19 0	19 0B	19 3S	18 9S
Coronation Freeholds	0 5B	0 5B	...	...	0 5B	0 5S
Clydesdales	11 6	...	10 6B	...	...	11 0
Crown Mines	...	...	...	...	130 0B	130 0B
East Rand Cent. ...	9 0B	9 0B	9 0B	9 0B	9 3B	9 3B
East Rand Coals ...	2 4	2 3B	2 3B	2 3B	2 4B	2 4B
East Rand Deeps ...	...	...	...	2 3S	2 0B	...
East Rand Props. ...	56 0B	56 3B	56 0B	56 0B	56 6	56 0B
East Rand Deb. ...	...	£92½	£95½	£92½	£91½	£92½
Eastern Gold Mines	1 9B	1 9B	1 9B	1 9B	1 9B	1 9B
Frank Smith Diam...	8 9	...	9 0S	...	...	8 3B
French Rands ...	1 0B	...	...	1 0B	1 0B	1 0B
Govt. Areas... ...	22 6B	22 9	22 6B	22 9B	23 3	23 0B
Glynn's Lydenburgs	26 0B	26 0S	27 0	...	27 6B	27 6
Ginsbergs	27 0B	27 0B	27 0B	27 0B	27 0B	27 0B
Glencairns	4 0B	5 0S	4 0B	5 0S	...	5 0S
Glencoe (Natal) Colls	5 9B	5 9B	5 9B	5 9B	5 9B	5 9B
Geduld Props. ...	...	20 0B	20 0B	20 6B	21 3B	...
Jupiters	8 0B	9 6B	10 3S	10 0B	10 0B	10 0B
Kaalfontein Diamonds	0 3	0 6S	...	0 3B	0 4B	0 3S
Klerksdorp Props. ...	3 0B	3 0B	3 0B	3 0B	3 0B	3 0S
Knight Centrals ...	13 0B	13 0B	13 0B	13 0B	13 3B	13 3B
Luipaardsvlei Estates	7 6B	7 6B	7 6B	7 6B	7 6S	7 6B
Lace Props.	3 0B	3 3B	...	3 0B	3 2B	3 3B
Lydenburg Gold Farms	2 1	2 0B	...	2 1B	2 1B	2 1B
Main Reef Wests ...	25 3B	25 3B	25 0B	25 0B	26 0	25 3B
Modder B's	58 0B	58 0B	58 0S	57 6B	58 3B	...
Midas Deeps ...	0 3B	0 3B	0 3B	...	0 3S	0 3B
Middelvlei Estates...	1 3B	1 3B	...	1 3S	1 4B	1 3B
Modder Deeps ...	...	...	...	27 0B	...	27 6B
New Eras	7 0	6 9B	...	7 0B	7 3B	7 1
New Kleinfonteins ...	28 3	27 6B	27 6B	27 6B	27 6B	27 6B
New Rietfonteins ...	8 3B	...	8 6B	8 3S	8 0	...
New Unifieds ...	17 0B	...	...	...	18 0S	17 0B
New Boksburgs ...	...	...	...	1 0B	...	1 3B
Nourse Mines ...	...	35 0B	35 0B	...	35 0B	35 0B
New Heriots ..	80 0	...	...	...	80 6B	...
Orange Diamonds ..	1 4B	1 4B	1 4B	1 4B	1 6B	1 4B
Pigg's Peaks ...	11 6B	11 6B	...	11 6B	11 6B	11 6B
Pretoria Cement Co.	51 0B	52 0S	51 6	51 0B	51 0B	50 0B
Pretoria Estates ...	...	...	17 6S	...	...	...
Paardekraal Estates	0 6B	0 6B	0 6B	...	...	...
Princess	9 9B	...	9 9B	9 6B	9 0B	9 8B
Rand Nucleus ..	2 6B	2 9B	2 9B	2 9B	2 9B	2 9B
Randfontein Estates	26 3	...	26 0B	25 9B	26 3B	26 6
Randfontein Deeps ..	4 0	4 0B	4 0B	4 0	4 0B	4 0
Rooiberg Minerals	31 6	31 0S	30 6B	31 6	31 6B	31 6
Rand Klips	4 3	4 0B	4 4	4 4B	4 4B	4 4B
Ryan Nigels ...	...	3 9B	3 9B	3 9B	...	3 9B
Simmer Deeps ...	...	3 6S	3 0	2 9B	3 0B	3 0B
South African Lands	4 0B	4 0B	...	4 0B	4 1B	4 0B
S. Randfontein Deeps	3 0B	3 3B	3 3B	3 3	3 3S	3 3B
Sub Nigels	5 0B	5 0	5 0B	5 0B	5 3B	5 0B
Springs Mines ...	15 6S	15 3S	15 6S	15 6S	15 3S	...
Trans. G.M. Estates	45 6B	44 0B	45 0	45 0B	45 3B	45 6B
Temple Tins	...	3 9	4 0	4 0B	4 0B	4 0B
Trans. Coal Trusts...	42 3B	12 0B	42 6B	42 6B	42 6B	42 0B
Tudors	...	...	...	2 0S	2 0S	2 0B
Van Ryn Deeps ...	17 0	17 0B	17 0B	17 0B	17 6	17 0B
Village Deeps ...	38 6B	...	38 9B	39 3B	39 6B	39 0B
Vogel. Cons. Deeps...	0 7B	...	1 1S	0 8B	0 9B	0 8B
Voorspoed Diamonds	9 0B	10 0S	...	8 0B	10 0S	10 0S
Van Dyks	...	1 0B	...	...	...	...
Witwatersrands ...	...	...	...	...	51 3B	51 0B
Wolhuters	19 9B	20 0	20 3	19 9B	20 3	20 3B
Witbank Collieries...	42 6B	42 6B	42 6B	42 0B	43 0B	43 6B
Wit. Deeps	...	...	44 0B	45 0B	47 6B	...
Zaaiplaats	41 0	40 3B	41 0	41 0	41 3B	40 3B

B Buyers. S Sellers.

ANSWERS TO CORRESPONDENTS.

"Jim" (Talana).—You could hardly choose a worse time to sell out. All the stocks you mention ought to command better prices later on.

"Anxious."—Enquiries being made.

"Lex."—We are promised an official statement for next week.

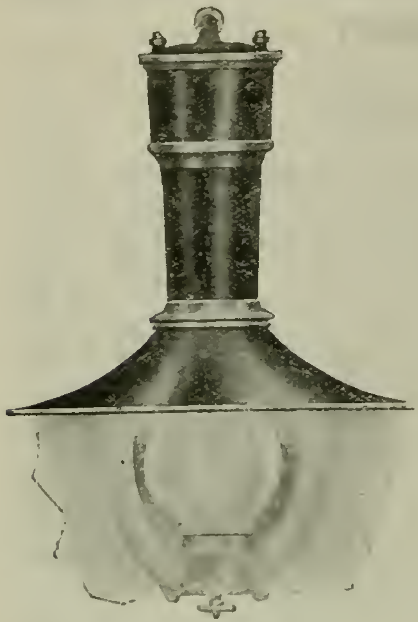
"Tins" (Bloemfontein).—Enquiring.

"Bubola."—We understand that the tests are still inconclusive, but are shaping more favourably.

INVESTORS' DIARY.

The following company meetings have been announced:—

July 26.—Booysens Estate; Middelvlei Estate.
Aug. 30.—Treasury Gold Mines; Wit. Deep; Crown Mines.
Sept. 4.—New Kleinfontein.
Sept. 21.—Wit. Deep.
Sept. 23.—Crown Mines.
Sept. 27.—Sub-Nigel; Simmer and Jack Prop.; New Kleinfontein; Wolhuter, G.M.
Oct. 19.—Wolhuter G.M.



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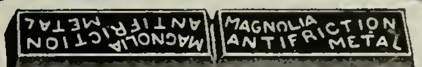

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Engineering Notes and News.

The Union Iron and Steel Works

(CARTWRIGHT & EATON, LTD.).

The attention of mine managers and engineers is called to an advertisement of the firm in this issue of the *S.A. Mining Journal*. The company is now in a position to execute orders for bar iron and steel, angle iron and tube mill, manufactured pegs, etc., locally. One great advantage is that they are prepared to supply their products in dead lengths, which should prove a source of great economy to the users. Any information will be gladly supplied on application to the town office, No. 20, London House, Loveday Street, 'phone 341, or direct to the works, 'phone 192, Benoni.

Trackless Trams: A Bloemfontein Scheme.

A public meeting of ratepayers was held this week at Bloemfontein to consider the proposal to lay down a system of trackless trams. The Town Council asked for authority to borrow £80,000, which includes the cost of flotation, to defray the cost of the entire scheme, which would give twelve miles, but recommended proceeding only with the first four miles, including a line to Tempe, the balance of the money to be invested until such time as the Council determined to continue the remaining sections. The section proposed to be first constructed is estimated to cost £31,000, and would have left the greater part of the town without tramway traction. The Town Hall was packed, and the temper of the meeting strongly favoured proceeding with the full scheme. After a statement by the Mayor, and considerable discussion, an amendment by the Ratepayers' Association to go on with the comprehensive scheme was carried on a show of hands by 131 to 18. A poll has been fixed for Tuesday, 23rd inst.

Rand Water Board Extension Works.

At the monthly meeting of the Rand Water Board, held this week, Mr. Ingham (chief engineer) reported that the extension works scheme at Zuurbekom is practically completed. The spare parts for the transformer, which were burn out during drying, are expected by the end of the month. The plant at No. 6 shaft has been raising water to the Central Station, and is in good working order. The four high-lift centrifugals at the Central Station are ready for raising the water, and tests are now in hand to see if sufficient current can be obtained from Zwartkopjes, without the transformers, to run one of the high-lift centrifugal pumps at the Central Station and the plant at No. 6 shaft. On the 30th June the new shaft in the coal measures was down 88 feet; the quantity of water met with at that date was about 130,000 gallons per day. The shaft has been close timbered for the full depth, but for the last fifteen feet the ground has been very difficult, and work has been stopped since the 4th inst. The size of the shaft is twelve feet by eight feet, and after refixing the timber for eighteen feet at the bottom, where bad earth slips have occurred, the shaft will be continued with a section of nine feet by six feet. There is every evidence that a considerable body of water will be met with within the next fifteen or twenty feet, and in this case also it is considered advisable to expend the additional amount referred to in another report. On the 20th June the new shaft on the farm Misgund was down 116 feet; the quantity of water met with at that date was between 50,000 and 60,000 gallons per day. Close timbering was carried down to a depth of 112 feet, and then the rock became sufficiently hard to stand without timbering. It is considered advisable to continue sinking, for the present, in the hope of striking a much larger supply of water on reaching the dolomite formation. When this shaft was commenced there was sufficient geological evidence to warrant him in expecting the water at a lesser depth, but in the course of boring operations it was found that the geological formation in the new shaft is quite different to that at the Cat's-eye, about 120 yards away, although the surface indications at both sites are apparently the same.

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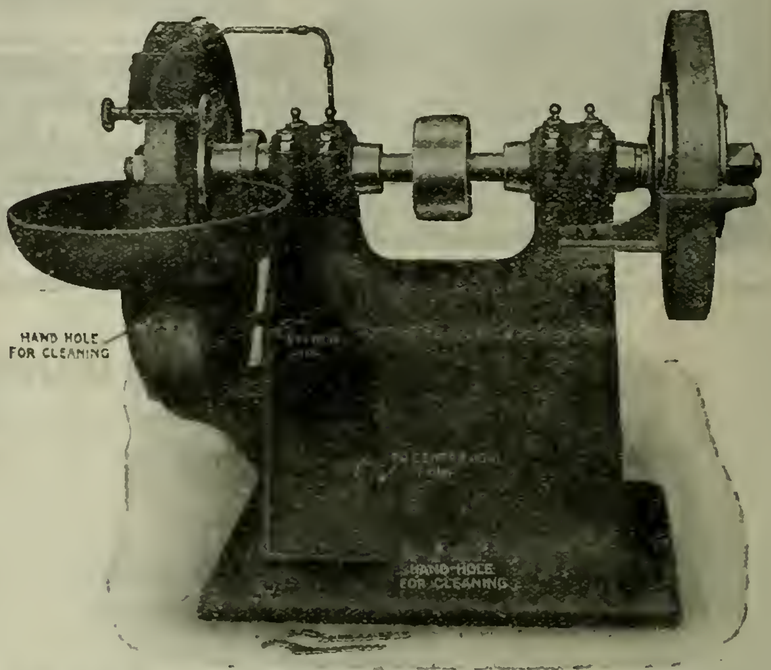

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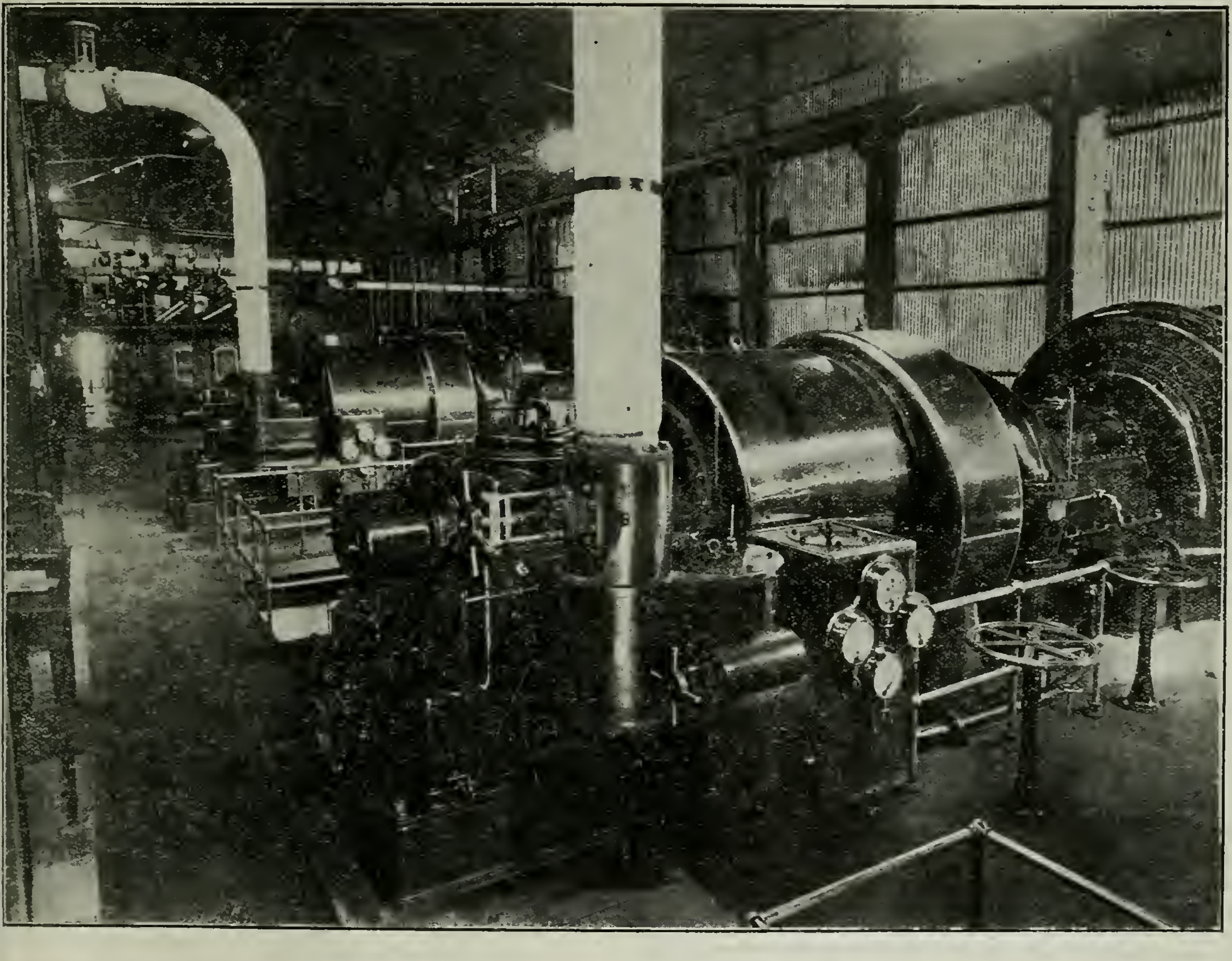
Electrical Notes,

The Troubles of Cables.

In his reply to discussion on his paper on this subject, read before the S.A.I. of E.E. recently Mr. A. E. Gibbs said : I have been gratified at the amount of discussion raised by my paper, also at the way members have given their experience with cables, and wish to thank all members who have taken part. There are two points in Mr. Wilson's paper which I wish to deal with. First, in comparing the question of faults on V.B. and L.C. cables he admits that with the L.C. cables a shut down of, at any rate, a small section is inevitable, and he must not forget that this fault has to be located and isolated before supply can be resumed, whereas with V.B. cables the fault can be located and often repaired without any shut down at all. Second, in my remarks on joint boxes I mention that with stuffing gland boxes there should be an opening from the box to the stuffing gland. This, I fear, was not very clearly explained, as Mr. Wilson has evidently misunderstood me. The cable is fixed and rigidly held by the stuffing gland partition, and the slot between the two halves of the partition, which is about a quarter of an inch wide, is sufficient to allow the compound to run through when filling the box. In reply to Mr. Nowlan, the unarmoured cable which was damaged was 0.053 core, and was laid at a depth of 2 feet. I can hardly think Mr. Nowlan means all he says in advocating laying unarmoured cables. The many thousands of pounds which have been and are being spent on armouring have proved its value. The case Mr. Nowlan mentions must have been a very exceptional one. My experience of unarmoured cables laid direct has not been a happy one. If a pick hits right on the centre of a cable, it will generally go through the armour, but for one blow on the centre there are scores of glancing blows which are turned aside harmlessly by the armour, which, if unarmoured, would pierce the cable. Decentralisation of V.B. cables is not in my opinion to be much dreaded in cables of present day manufacture if reasonably treated, but I must say the engineers responsible for continuing to run a one square inch cable at a density of 1,500 amps, and which had already begun to show signs of decentralisation, must have been very hard up for cash, or they would have added to their copper. There is one point in Mr. W. E. Dew's contribution which requires notice. I refer to his experience of water travelling up a length of cable 300 yards long. To prevent this trouble of water travelling up a fault, the strands of cables are now frequently filled with compound. I quite agree with Mr. Pickles that every effort should be made to completely surround the cable with the filling compound, and in my paper should have said that one ought not to rely on the insulation of the lead, but to try to insulate it if possible. It is quite a common practice to add oil to bitumen to make a plastic filling compound. Mr. Ross mentions the case of trouble with a shaft cable due to the impregnating compound, which would, I think, in this case be a resin oil, softening the compound in the tail end box, which in consequence drained out. My remedy would be to use a different type of cable. Cables are obtainable in which the impregnation is not a free oil, and which will not drain out under these conditions. What is known as a weeping test is often included in cable specifications, viz., that a length of cable hung up with open end for a specified length of time will not weep. Mr. Kirkland mentions a fault he saw at the Robinson Deep where the copper had open circulated. I have, on several occasions, seen the copper fuse right back into the paper, leaving an empty paper tube, thus giving an absolutely good insulation test. The approximate position of such a fault can be obtained by taking a capacity test from each end, and comparing; by this means quite a lot of digging would thus be saved. A considerable amount of discussion took place on the question of tail ends from boxes. In my opinion the method adopted by Mr. T. S.



Johannesburg Municipal Power Station Interior.

Collins cannot be improved on, but very great care must be taken in sweating the strand solid. Mr. Anson does not agree with double working pressure being put cn a cable after laying, owing to the possibility of damage to the cable, but he has evidently overlooked the fact that the cable has already had double pressure put on in the factory, which has been followed by an insulation test. The double working pressure test after laying, I look upon as a test of the joints and to detect any damage in laying, and, in my opinion, is most essential. It is a poor cable which will not stand it without damage, and cables on three-phase networks often have to stand up to much worse in actual practice. My paper did not refer to networks, but as its title states, only to trouble on cables. Mr. Anson has evidently given some thought to the subject of networks, and I am sure our members will be very pleased if he will let us have the benefit of his knowledge in a paper on this subject.

Transformers.

In the course of a discussion on the design and installation of transformers, before the South African Institute of Electrical Engineers, recently, Mr. L. B. Woodworth said: I would like to enlarge upon the manner in which transformers are held in the containing case. Speaking from the mining side, I remember that when electrification started on the mines some two or three years back there was a great demand for transformers. On one of the mines two transformers arrived, the sizes being 250 and 500 K.V.A. When the cases were opened, and the transformers inside the tanks were examined, it was found impossible to put either into service, owing to damaged coils and laminations due to severe handling in transit. Transformers arranged differently by another firm arrived quite satisfactorily. I think that the problem of proper packing, bracing, etc., requires most careful attention. Another point is the shipment of transformers complete with oil-filled case. Some two years ago on a certain mine about 125 miles from here, a plant had to be started in record time. The step-up and step-down transformers arrived full of oil, and tested very well, and were put into service at once. A few months back a further two transformers were urgently required, and upon arrival it was found that the transformers and containing cases were in separate cases. It took a week to dry everything out and get the apparatus ready for service. It is a pity that manufacturers do not study this question more, and arrange to send out large transformers ready filled, so as to be ready for instant service, instead of shipping the cases and transformer windings and coil separately, and causing the man on the mine endless worry.

A New Crane.

The G.E.C. have introduced a neat appliance in the form of a self-propelled jib crane. This is driven from a battery and will handle loads up to one ton and transport them while on the hook. It is also suitable for hauling a truck. The following are a few particulars:—Speed, light, 9 miles per hour; speed, one ton on hook, 7 miles per hour; speed, five tons on trailer, 5 miles per hour; Battery capacity, 168 ampere-hours; motor, 85 volts, 28 amps., 1,200 revolutions; wheel base, 60 inches. This might be useful in certain localities in the Transvaal.

Specimen copies of the *S.A. Mining Journal* can be had from our new offices at 125, Salisbury House, London Wall, E.C.

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Mail Contract.

A definite settlement as to the terms of the contract for the conveyance of mails and Government freight respectively between the Union Government and the Union-Castle Company, was reached this week at a conference attended by Sir David Graaff, Sir Owen Philipps and Sir Richard Solomon. The drafting of the formal contract is now in the lawyers' hands, and the contract will be ready for signature before July 27, when Sir David Graaff will sail for South Africa. This contract is in addition to the agreements with the Colonial Office and Post Office, which have already been concluded. It is stated that the agreement is eminently advantageous to the South African Government, which adhered to the terms of the Post Office Act.

* * * *

Dynamite Sub-soiling Demonstration.

An extensive series of demonstrations in the use of dynamite for sub-soiling purposes are now being held throughout the country by the Cape Explosives Works, Ltd., and the British South African Explosives, Ltd. Wherever possible, farmers should make a point of attending such demonstrations, as it is only by actually "seeing the thing done" that a true idea of the value of dynamite to the farmer and of the *modus operandi* can be obtained. The whole operation, as recently described in our columns, is simple enough, and can soon be thoroughly grasped by any intelligent man.

* * * *

Head Wrightson & Co.

The report of Head Wrightson & Co., Ltd., for the year ended 30th April last, to be presented at the meeting at Thornaby-on-Tees on 22nd inst., states that the gross profit has been £26,564, to which has been added the balance brought forward, £1,319, making £27,884, which the directors propose shall be applied in payment of interest on debentures for year ended 30th April, 1912, £6,750; dividend on the preference shares to 31st March, 1912, £9,302; reserved for dividend on preference shares from 31st March to 30th April, 1912, £845; directors' fees, excluding management salaries, £1,000; carried to reserve account, £2,710; depreciation of capital expenditure, £5,000; balance to be carried forward, £2,276.

* * * *

South African Breweries.

The full report of the S.A. Breweries, to be presented at the seventeenth ordinary general meeting, is now to hand. Trading conditions throughout South Africa, it states, have been steady during the period under review, disclosing a stability and soundness that augurs well for the future. The company's business has made satisfactory progress, and the excellent quality of its beers has been fully maintained. The breweries and licensed properties of the company have been kept in thorough repair, and, in order to cope with the increasing demand, extensions to buildings and additions to plant are being made to the breweries and depots where necessary. The Salisbury brewery has now been rebuilt and equipped with modern machinery and plant, and is fulfilling the anticipations formed when this business was acquired. Advantage has been taken of opportunities afforded during the year to convert into freehold some properties that were formerly held on long leasehold title. All the sites on which the breweries are erected are now the freehold property of the company. In order to encourage farmers in South Africa to cultivate barley for brewery purposes, imported seed has been distributed, and maltings are being erected at Pretoria. During the year Mr. C. A. Chiddell visited South Africa and investigated the affairs of the company. His report satisfies the Board as to the efficiency of the management and the prospects of the company. The thanks of the shareholders are due to the General Manager, the Assistant General Manager, and the Managers and staffs in London and South Africa for the efficient and loyal services they have rendered. The total profits for the year are £283,936 8s. 5d., which, with the amount of £32,875 11s. brought forward, make a total of £316,811 19s. 5d. After making full provision for depreciation there remains a balance of £286,036 19s. 5d., and the directors recommend that £20,000 be added to reserve, increasing that fund to £650,000; that final dividends of 2½ per cent. on the preference shares (making 5 per cent. for the year) and 10 per cent. on the ordinary shares (making 17½ per cent. for the year) be paid, and that the balance of £37,394 13s. 11d. be carried forward.

* * * *

Nyasaland.

In Nyasaland the Imperial Government has made a loan of £180,000 to the Protectorate to repurchase the subsidy lands originally granted to the Shire Highlands Railway, and at the same time the Protectorate Government is giving a guarantee of interest at 4 per cent. on £500,000 to the existing railway for its extension. The railway, instead of stopping, as now, at the almost unnavigable Shire River, would be taken direct to the Zambesi, and south of the Zambesi again by another company down to the port of Beira. It is contemplated that the Zambesi will ultimately be bridged to join the two lines, and the Colonial Secretary has hopes that the work may be taken in hand before the completion of the railway. He hopes also in the not distant future that the railway system will be extended northwards up to the south end of Lake Nyasa itself.

* * * *

Magadi Soda Company.

At the ordinary general meeting of the Magadi Soda Company, Ltd., held in London, the chairman said, *inter alia*:—"The negotiations which I disclosed to you at our last meeting eventuated in making a contract with Messrs. Pauling & Co. for the construction of the railway and port works, and the plans submitted have been approved by the Government. The contract was actually signed last September, but little construction was accomplished during the first few months owing to the difficulties which the contractors claim they experienced in securing the large number of labourers necessary. Happily these difficulties have been surmounted, and we have the assurance of the contractors that work is now proceeding satisfactorily. The preliminary work for our deep-water pier is now in progress and we anticipate that it will be ready to receive steamers and cargo before the railway is completed. The Uganda Railway have placed an order for new rolling stock, which will be shipped before the completion of our branch line. No time, therefore, will be lost in getting to work. An excellent site on the Magadi deposit has been selected for the construction of the works. Machinery has been designed for gaining soda from the deposit expeditiously and economically. The employment of labour is reduced to a minimum. All who have visited the district have confirmed the original reports of the immensity of the deposits and are enthusiastic as to the facilities of working. Your directors hope that work will be carried forward so rapidly that it will be desirable to call further capital before the end of the year. Further investigation has confirmed our opinion that the prospects for the company as soon as products can be put upon the market are very bright, and we look confidently to be able to secure a ready sale for our products. The consumption of soda, and soda products, is steadily increasing, and your directors have no doubt that they will be successful in obtaining for you a fair proportion of the world's trade."

* * * *

Mr. A. O. Hoppe has bought the Beach Hotel, East London, from Mrs. de Beer, and is adding on a new wing. The hotel will have 70 large airy bedrooms from the 1st November.

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Automobile Notes.

The Park Trophy.

The "Park" trophy, as announced last week, will be competed for on the 10th and 11th of August, the route selected being the Johannesburg-Potchefstroom road, via Baragwanaths and the Gatsran (old Kimberley coach-road). Competitors will stay overnight at Potchefstroom, returning by the same route the following day. The competition is open to members of the club only, but the entrant need not necessarily drive the car himself. Competing cars weigh in on the morning of the race at the Municipal Weighbridge, Market Square, and from thence will proceed to the starting point at Booysens. Arriving at Potchefstroom, all cars must proceed direct to the control appointed at that place, remaining there until competitors are prepared to start on the return journey to Johannesburg. Only such minor adjustments and attention to cars as appear in the rules and conditions governing the contest are permissible while the cars are within the control. All contestants are required to make a non-stop run, by which is meant that the engine and road wheels must not be stopped at the same time. Punctures, however, will not constitute a stop, provided the engine is kept running during the actual time occupied by the repair. Competing cars must be in touring condition, and shall not carry more passengers than the seating accomodation reasonably provides for. The distance for the total run will be taken as 75 miles. The deciding formula takes into consideration total weight of car, miles per hour, and petrol consumption. In addition to the "Park" trophy, the T.A.C. offer first, second and third prizes, and non-stop medals will be awarded all competitors qualifying under the conditions laid down. The trophy, it may be mentioned, becomes the absolute property of the competitor who wins it twice in three consecutive competitions. The club committee are endeavouring to arrange a special competition for American cars, to be held simultaneously with the "Park" trophy trial, particulars of which will be issued at an early date.

The Annual Overhaul.

The exodus from Johannesburg overseas and to the coast, for so long uninterrupted, according to recent returns, shows appreciable diminishing, a natural course seeing that the winter season in these parts is now far advanced. A considerable number of machines owned by the motorists included in the 20,000 people, who have taken their exit from the city to different parts, have been undergoing the annual overhaul during the absence of the owners, while many of the latter, on the other hand, who decided on taking their cars to the coast watering places by this wise action have contributed largely to the success of the holiday planned. The value which will attach to the completion of the much-discussed Rand-coast road, in regard to the motorist, is apparent, when the railing of machines will be dispensed with, and the delights of travel by car are brought within the reach of those so disposed. Parts of the intervening country traversed in a journey from Johannesburg to the coast are unique from a scenic aspect, and it is quite probable that this new road, the next winter season, will entice many motorists to undertake the trip by car. The approaches to several important centres, by the way, now in undeveloped state, which lie off the route mapped out for the grand trunk road, should be accorded a deserving attention in conjunction with the larger scheme, with a view to offering facilities to motorists en route to the coast, who may prefer a holiday, partaking of an itinerary nature, embracing visits to the places referred to, rather than proceeding direct to their destination. This could be rendered possible were the construction of roads attempted from the points best workable from the main route, to those parts intended to reach. A net-work of roads thus effected, in addition to popularising motoring in South Africa, would materially assist to further cement the good relations already existing between the peoples of the various Provinces.

New Garages.

Several new local garages have sprung into existence quite recently, and a large block in the centre of "the petrol area" has been secured by a firm, long identified with the motor trade in Johannesburg, whose intention it is to erect one of the finest garages yet attempted on the Rand, facts which prove that this particular industry is far from lanquishing. Many of the buildings at present serving as garages present a deplorable appearance, being, to say the least of them, unsightly reminders of the days when Johannesburg was in very truth a mining camp, with no pretentions in point of architecture beyond the wood and iron shanty, and places of this description now occupied, in many instances, by representatives of the motor industry reflect discreditably its flourishing condition, and are quite unworthy of this important branch of South African industrial enterprise. Garage proprietors, who to a large extent are at the mercy of the landlord, who, it may be pointed out, is prohibited from improving old buildings, should enlist the sympathy of the Council to compel the owners of the many shanties to erect modern approved buildings. Where the garage man owns the property, the building invariably is found to be of a substantial nature, conforming to the usual fire and other conditions governing garages. The point at issue is clearly: Do the shanties doing duty as garages meet the municipal requirements in regard to protection from fire, or are they, and the buildings in their immediate vicinity, exposed to unnecessary risk?

The Demand for a Light Car.

The demand for a light car, moderate in price and at the same time efficient, is reasonably met, it would appear, in the 8-10 h.p. two-seater Phoenix. This machine is a roadster with a remarkable reserve of power, admirably suited for use in a country of a hilly nature, such as South Africa. In addition, this neat run-about is very easy to handle, the gear-changing is practically silent and simple, and the brakes, while being powerful, are yet sweet in action. The manufacturers claim for the efficient chain drive which they specialise that power is transmitted by its adoption, with fewer changes of motion, and with it the drive is "direct" in the truest sense of the word. Simplicity of steering is another prominent feature of this machine, and, briefly, an all round excellence certainly turns the scale in favour of the Phoenix when comparisons are attempted, with many in the small car category, in regard to price.

Street Dangers.

Many suggestions have been made from time to time with a view to minimising the danger which pedestrians encounter in streets where motor traffic abounds. One of the latest ideas to obviate this risk emanates from Dr. Waldo, Coroner for the City of London, who advocates the fitting of a "cow-catcher" arrangement to all motor vehicles, and mentions his personal experience in seeing a youth fall in front of a tramcar and was pushed aside by the catcher practically uninjured. He draws an inference from a similar occurrence where a motor bus may be concerned, and concludes that the chances of escape would be very small. Were such unsightly contrivances in the first instance to be adopted on motor vehicles they would serve a very insignificant purpose in that they could not be serviceably fitted close enough to the ground, owing to the danger created to the machine from ground inequalities and so forth. Their use, however, on a tram car, which at all times maintains the same relative position on a track is obvious. Pneumatic buffers introduced some years ago were much more practical, but on account also of their unsightly appearance never came into favour. These were crescent shape, curving in front of each wheel, and, provided the pedestrian luckily avoided the centre of the car the impact from contact with the buffers could not be considered seriously.

Cleaning Out Cylinders.

Having in view the many improvements effected in car construction, it is a source of surprise that so very little seems to be done by manufacturers to bring about a design which will facilitate the cleaning out of the carbon deposits in the cylinders. Many engines are run in bad condition simply in the absence of knowledge on the part of the owner, or because he does not care to accept the responsibility of cleaning out the cylinders himself and cannot afford the time a garage would expend in doing this work. Many compounds are in use to loosen deposits, which can be put into the cylinder, which the engine in turn will cause to be thrown out at the exhaust. Nevertheless, it becomes necessary at times to take the engine down and subject it to a thorough overhauling.

Report on Cape Property Transfers, 1911.

Mr. Hy. Gibson contributes to the report of the Capetown Chamber of Commerce the following:—

Following the lines initiated in my last report, the figures for the Capetown Registry are as follows:—

	1909.	1910.	1911.
Number of transfers ...	8,366	8,522	9,102
Value of properties... ...	£3,253,242	£3,660,192	£4,382,462
New bonds passed	4,859	4,301	4,585
Total value	£4,372,399	£3,618,414	£4,212,101
Bonds cancelled	4,384	4,785	5,342
Total value	£3,298,036	£2,713,626	£3,213,612
Leaving an increased indebtedness of	£1,074,363	£904,788	£998,489

As will be readily seen, there has been a notable increase in the figures all round, and in some of the country districts the increase in the values of properties sold has been considerable. To enable this tendency to be watched, I have extracted some of the more notable figures in the hope that they may prove interesting. The following table gives the values of properties transferred in the districts quoted during the past two years:—

	1910.		1911.
Cape	£270,332	......	£302,211
Cradock	67,516	......	162,631
East Griqualand ..	78,282	......	124,503
Graaff-Reinet ...	68,080	......	102,542
Oudtshoorn ...	312,340	......	374,629
Stellenbosch ...	44,771	......	72,803
Uitenhage	71,319	......	159,663
Victoria West ...	72,902	......	107,488

In dealing with these figures, it must not be forgotten that any indebtedness cancelled by insolvency is not written off until a later date. It will be noted that Oudtshoorn for the second time in succession heads the list, with the Cape a close second, whilst the figures for the five other districts now exceed £100,000. Enquiries show that not only have the totals increased, but that the general tendency of values has been in the same direction, and, in view of the fact that this tendency has been so marked for some years past, it is a question whether prices of rural properties have not advanced quite as much as is warranted by their productive capacity under existing methods and circumstances, and investors as well as merchants will, it seems to me, do well to look more closely into this aspect of the returns. I learn that in some districts the purchase amounts as disclosed in transfer deeds already show a slight tendency towards lower values. In 1911, as in 1910, the amount of new bonds passed was less than the value of properties transferred, an opposite state of affairs having prevailed for a series of years previously, and, considering the volume of transactions involved, the increase of indebtedness of under a million sterling is not excessive. It is also pleasing to note that during the same years the number of bonds cancelled exceeded the number of bonds passed, whilst formerly the opposite was the case. Taken all round, the returns indicate that the healthy figures commented on last year have been continued during 1911, and there is distinct evidence that considerable prosperity exists in the country districts. The Registrar of Deeds has on several occasions drawn attention to the utterly inadequate accommodation for the invaluable records in his possession, and with the increased work of the department as shown by the above returns, coupled with the extra duties which are continually being assigned to the Deeds Office by legislation, the lack of office room prevents several improvements being carried out. Among the latter, which would be of great service to this Chamber, is a system of registers for each district. Under existing circumstances, this valuable extension of the information obtainable from the records has perforce to wait. The question of the various registries in the Union has been referred to on a previous occasion, and is brought up again so that the matter may not be lost sight of. At present a debtor may have property in no less than seven separate registers with bonds containing the general clause registered on each. The position of creditors as time goes on is sure, under circumstances even approximately that described, to lead to confusion and litigation. No doubt the Government will deal with the position in due course, but when the time comes the necessary measures will require most careful thought to ensure equitable working.

Contracts Open.

The Municipal Council of Johannesburg invites tenders for the supply of sanitary pails and lids (August 2nd), licence plates and badges (2nd August).

The Secretary to the Tender Board, S.A.R. Headquarter Offices, Johannesburg, invites tenders for the supply of 904,625 hardwood sleepers or (alternatively) creosoted Baltic sleepers (July 23).

The Chairman of the Union Tender Board, Box 371, Pretoria, invites tenders for the supply, delivery, and fixing in position where necessary, certain show cases, furniture and fittings, to the Public Museum at Bloemfontein (July 31).

The Corporation of Pietermaritzburg invites tenders for the supply of one steam turbine with tandem generators, switchboard, and condensing plant (July 29).

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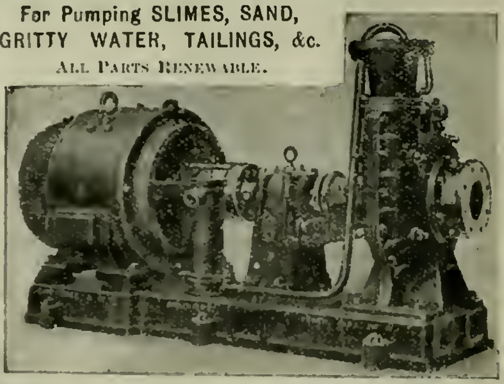

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The Wolhuter Gold Mines, Limited.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

It being desired to create a further seat on the Board of Directors, it is proposed to increase the number of Directors from nine to ten.

NOTICE IS HEREBY GIVEN that an Extraordinary General Meeting of Shareholders of the Wolhuter Gold Mines, Limited, will be held in the Company's Board Room, Cullinan Building, Johannesburg, on FRIDAY, the 27th SEPTEMBER, 1912, at 11 a.m., for the purpose of considering, and if thought fit, of passing, with or without modification, the following resolution :—

> "In Clause 62 of the Company's Articles of Association to substitute the word 'ten' for the word 'nine' therein occurring."

AND NOTICE IS HEREBY FURTHER GIVEN that a further Extraordinary General Meeting of the Wolhuter Gold Mines, Limited, will be held in the Board Room, Cullinan Building, Johannesburg, on SATURDAY, the 19th OCTOBER, 1912, at 11 a.m., for the purpose of receiving a report of the proceedings of the foregoing Meeting, and if the said Resolution has been passed, of confirming it as a Special Resolution.

The London Transfer Registers of the Company will be closed from the 2nd to the 7th September, 1912, both days inclusive, and the Head Office Transfer Registers of the Company will be closed from the 23rd to the 27th September, 1912, both days inclusive.

Holders of Share Warrants to Bearer desiring to vote must deposit their Share Warrants at the Head Office of the Company, Johannesburg, at least 24 hours before such Extraordinary General Meeting, or at the London Office, Salisbury House, London Wall, E.C., on or before the 4th September, 1912, together with a statement in writing of the name and address of the Holder of the Warrants, in exchange for which a Certificate will be given entitling the Holder to attend and vote at the Meeting in respect of the Shares specified in such Certificate.

By Order of the Board,

H. G. L. PANCHAUD,
Secretary.

Head Office :
Johannesburg.
29th June, 1912.

Department of Mines.

The following Government Notice is published for general information.

H. WARINGTON SMYTH,
Secretary for Mines.

Office of the Minister of Mines, Pretoria.

No. 991.] [17th July, 1912.

MINES, WORKS, AND MACHINERY REGULATIONS.

It is notified that the St. John Ambulance Association is recognised by the Honourable the Minister of Mines as an Association for the issue of First Aid Certificates in terms of Regulation No. 277 (3) of the Mines, Works, and Machinery Regulation, 1911.

Nourse Mines, Limited.

(Incorporated in the Transvaal).

Declaration of Dividend No. 16.

NOTICE is hereby given that an Interim Dividend of Five per cent. (One Shilling per Share) has been declared by the Board for the half-year ending 31st JULY, 1912.

This Dividend will be payable to all Shareholders registered in the books of the Company at the close of business on 31st July, 1912, and to holders of Coupon No. 16, attached to Share Warrants to Bearer.

The Transfer Books of the Company will be closed from the 1st to the 7th August, 1912, both days inclusive.

The Dividend will be payable to South African Registered Shareholders from the Head Office, Johannesburg, and to European Shareholders from the London Office, 1, London Wall Buildings, London Wall, E.C., on or about the 4th September, 1912.

Holders of Share Warrants to Bearer are informed that they will receive payment of the Dividend on presentation of Coupon No. 16, at the London Office of the Company.

Coupons must be left four clear days for examination, and will be payable at any time on or after the 4th September, 1912.

By Order of the Board,

RAND MINES, LIMITED (Secretaries).
S. C. STEIL, Joint Secretary.

Head Office: The Corner House,
Johannesburg, 17th July, 1912. 38451

Glynn's Lydenburg, Limited.

(Incorporated in the Transvaal.)

DECLARATION OF DIVIDEND No. 22.

A DIVIDEND of 15 per cent. (3s. per share) has been declared by the Board, payable to all Shareholders registered in the books of the Company at the close of business on WEDNESDAY, the 31st of JULY, 1912.

The Share Transfer Books will be closed from the 1st day of August, 1912, to the 7th day of August, 1912, both days inclusive.

The Dividend will be payable to South African Shareholders from the Head Office, Johannesburg, and to European Shareholders from the London Office, No. 1, London Wall Buildings, E.C., on or about 6th of September, 1912.

By Order of the Board,

W. RUSSELL SLACK,
Secretary.

Head Office :
The Corner House,
Johannesburg, 15th July, 1912. 38180

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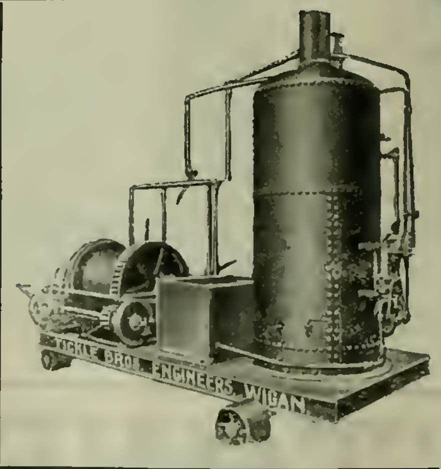

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South African Mines, Commerce and Industries.
ESTABLISHED 1891.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1½d. All other parts, 2½d.

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Notes and News.

The Rand Outlook. One need not be an incorrigible optimist to admit that the outlook for the Rand is improving. Quarterly reports from many of the leading mines are published this week, showing several good features. Moreover, general conditions are on the mend. It is not necessary to reduce the saving to be made by the new recruiting corporation to pounds, shilling and pence to appreciate the money value of the reform to the mines. Enough that it is a big step in the direction of economy. Other savings, not less tangible, will result from the reduction in railway rates. Here again exact estimates are as difficult as they are unnecessary. Cheaper power is also beginning to come into the realm of practical economics, and the tendency under this head is well in the right direction. Further, the "boom" now ✓ being enjoyed by the farming industry can have nothing but good results for the Rand. Increased production ought to bring down the cost of living, and the prosperity of the farmers may thus in more ways than one lighten the burden on mining. Of purely domestic interest is the fact that the new men introduced into the industry some few years ago are getting to grips with the problems peculiar to these mines, and the end of their period of probation may be the beginning of a better era for the Rand. Recent untoward incidents have already been consigned to the "limbo of forgotten things." Lastly, the efforts of the groups—backed by the Government—to improve living conditions on the mines, to stamp out phthisis, to fight pneumonia and reduce the high native mortality rate, are bound to be attended by good results. To take the lowest ground, these efforts are "good business"—they have a money value and will in time pay dividends to the shareholders. Taken together, these things, even at this dark hour, seem to justify a profession of undiminished faith in the future of the Rand.

* * * *

Derdepoort. Derdepoort, otherwise Central Diamonds, continues to be the topic of the hour. During the week representatives of De Beers visited the property, but returned to Kimberley with their opinions locked in their bosoms. It is noteworthy that the occurrence was described about nine years ago by the Geological Survey, but there is no hint of their believing it to carry diamond-bearing kimberlite. The extent of the Derdepoort deposit is certainly enormous—exceeding that of the Premier—but the commercial value of the property has yet to be proved. Expert opinion, on balance, seems favourable to the property, but it is generally agreed that it is too early, owing to the insufficiency of work done, to draw any conclusions on the payability of the venture. The capital, it may be mentioned, is £20,000, so that at £2 per share the property is valued at £40,000. We deal more fully with the property elsewhere in this issue.

* * * *

Roodeplaat. A similar occurrence to Derdepoort exists on the farm Roodeplaat, some miles north of the former. Mr. W. E. Bleloch holds an option on Roodeplaat, and the farm is marked on the geological maps as containing a big area of breccia. From the spruit below the pipe a nice parcel of diamonds has been won, pointing to a concentration in close proximity to the occurrence. Little work and no washing has been done on the breccia, but a small stone was picked up at a depth of 45 feet in a prospecting shaft. The occurrence is described as bigger than Derdepoort, and will, no doubt, be subjected to a thorough test.

* * * *

Technical Training in South Africa. An important paper on the training of artisans and skilled operators in South Africa, by Mr. H. Bromley, read at a recent meeting of the Society of Civil Engineers, was printed in our last issue. The ideal system for the training of tradesmen is that of the apprenticeship, but many difficulties are encountered in achieving that solution of what is a big problem in this country. The writer of the paper estimated that the direct expenditure for the training of a carpenter in South Africa amounted to £250, as against, say, £50 in Great Britain. He advocated a more stringent application of the compulsory education law, and the provision of trades' night schools as means for bringing about a better state of affairs in regard to technical training than at present exists in South Africa. The results obtained in other countries by those means afford illustrative examples of what can be accomplished, and it is in the permanent interests of employers and employees alike that a reliable class of workers shall be established.

* * * *

No More Dry Farms.

Mr. J. A. Yule, the President of the South African Institute of Engineers, will doubtless be glad to hear that the Government is putting into operation one of the suggestions made in his recent inaugural address. The Land Department has decided to allot no more dry farms—in future the dry farms now held by the Department will be made "wet" by Government drilling before allotment. Mr. Yule, it will be remembered, suggested that good work could be done by the Land Department by the employment of a special staff of experts with up-to-date machinery to put down boreholes on farms. This would greatly assist irrigation. He admitted that the Irrigation Department was already doing something of this nature. The cost of such boreholes to the farmers should be kept as low as possible to be within the scope of the average farmer. Payments could be arranged to extend over a certain period.

* * * *

Transvaal-Mozambique Convention.

The *Mozambique Gazette* understands that the Government of the South African Union have made application to the Imperial British Government for leave to re-open the question of the Transvaal-Mozambique Convention with the object of effecting, if possible, an alteration in some clauses of that instrument. It further understands that such request has been transmitted, in proper form, to the Portuguese Government at Lisbon. The matter is at this stage now in the hands of the two local Governments, as a subject of conference, and the preliminary work in this direction has already been accomplished at a series of informal meetings of the members of the Joint Railway Board held at Capetown. Real effective work in the matter is expected to commence in the month of September next, when a formal conference, at which representatives of the South African Union and the Province of Mozambique will be present, will be held at Lourenco Marques. So far as we know, the Portuguese representatives at this conference have not yet been selected, but it is more than possible that two of them will come from Lisbon, one being particularly "well up" in all South African railway questions and being also possessed of exceptional experience in railway negotiation and diplomacy, whilst the other is just as exceptionally conversant with South African Colonial matters and their bearing on the subjects which are about to be re-opened. Moreover, it is just possible that a third may be one who has long been resident in South Africa, whilst it is also possible that the Governor-General of Mozambique may occupy the position of president of the conference.

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An Engineering Scandal.

With reference to our recent note under this head, we desire to make it clear that no imputation or reflection of any sort was meant to be cast on the firm successful in tendering for the Winburg Municipal contract in question.

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The Bushtick.

Under the vigorous management of Mr. D. V. Burnett the Bushtick is "looking up," the plant is being rearranged, tube mills installed, and six Nissen stamps added to the present battery of 20 heavy stamps. All this augurs well for the prospects of the mine's development, in view of Mr. Burnett's well-known caution.

Rooderand.

Total expenditure of the Rooderand Gold Mining Company for 1911 amounted to £3,741. The estate revenue and dividends on investments totalled £2,995. The balance, £745, represents expenditure in excess of revenue, £640 6s. 6d. of which is due to loss on realisation. The property consists of two quit rent farms, practically 6,000 acres freehold, upon which there are two mynpachten of an area of 235 morgen 191 square roods and 208 claims. Mining operations during the year have been confined entirely to the Odin Reef, but the directors decided to close down all work and await further developments in the neighbourhood. An interest has been acquired in the Solomon's Temple Tin Mines, and recent reports show favourable indications from developments now being carried out on that property.

* * * *

Anglo-German Tins.

We have received from the secretary of Anglo-German Tins a lengthly extract from the mine report on June operations, accompanied by an intimation that the full report is open for the inspections of shareholders at the offices of the company. As the extracts in question appeared in the daily papers on Thursday, it is only necessary to repeat the concluding portion, which is as follows:—"The results this month have been satisfactory and encouraging. The two lodes are, if anything, improving in depth. I am having the rock broken up for a systematic sampling, and hope to be able to report next month. Finding tin in the White Hill (west off north drive) and in the No. 3 trench, is the best feature of this month's work."

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Apex Gold Mine Closed Down.

An official statement has been issued to the effect that, pending the provision of further working capital the board of directors of the Apex Mines have decided to suspend operations on the gold section of the company's property with the exception of the necessary work for keeping the mine free of water. It is to be hoped that the stoppage is merely temporary until the arrangements now in progress are completed.

* * * *

South Randfontein Deep.

At an extraordinary general meeting of shareholders of the South Randfontein Deep, Ltd., held on the 24th inst., at which Mr. Hans Neuhaus (chairman) presided, and 190,846 shares out of an issue of 450,000 shares were represented either personally or by proxy, the extraordinary resolution passed at the meeting held on the 2nd inst. was duly confirmed as a special resolution. In terms of such resolution the company is now placed in voluntary liquidation, and Mr. Henry Rogers, of Pinners Hall, Austin Friars, London, E.C., is the liquidator. The liquidator (or his agent) will distribute the 75,000 Randfontein Central shares held by the company amongst the shareholders *pro rata* to their holdings. Steps will be taken to call in the issued shares of the company and distribute the Randfontein Central shares as soon as the appointment of the liquidator has been recognised by the Supreme Court (Transvaal Provincial Division).

* * * *

Otavi.

The gross profit of the Otavi Mines and Railway Company for the year ended March 31st, 1912, amounted to 3,962,978 marks, as against 7,667,889 marks last year, which included a profit on the sale of the railway of 3,635,117 marks. The net profit after writing 867,000 marks off mining works, and appropriating 412,204 marks to renewals and constructions, and 200,000 marks to reserves, amounts to 2,483,767 marks. The dividends recommended are 6 marks per ordinary share and 5 marks per Genusscheine, which possess no nominal value. The development of the 4th level has proceeded so far that the mining of ore can be begun, while the preliminary work for the opening up of the 5th level has been started. Borings down to 20 metres below the 4th level have proved ore throughout of the same good quality as hitherto. The great improvement in the price of copper and lead which has recently taken place will be chiefly reflected in the results of the current financial year.

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T.C.M.E. Dividends.

In the matter of profits, the Transvaal Gold Mining Estates has been annually beating its own records for more than half a dozen years past. Whereas in the financial period 1904-5 the earnings were only £16,500, those for 1910-11 amounted to £204,900, and the late report showed that in the twelve months ended 31st March a small further advance, to £205,100, was made. Dividends, however, have not progressed in the same steady manner as profits, although there has naturally been a substantial increase in the distributions amongst the proprietors. For three years they received nothing at all, then dividends were resumed in 1905-6, 10 per cent. being distributed on account of that and of each of the two following years. A relapse occurred in 1908-9, for which period 7½ per cent. was paid, but in the following term the dividend jumped up to 22½ per cent. High-water mark was reached in 1910-11, the total distribution for which was 30 per cent. Although profits created a fresh record in 1911-12, there was a slight relapse in the rate of distribution to 27½ per cent.

* * * *

African and European Investment.

The report of the African and European Investment Company for the fifteen months ended March 31st last refers to the reduction in the capital to £1,275,000 in £1 shares, of which £1,153,944 is issued, leaving 121,056 shares in reserve. The company holds over one million and a quarter acres of land in the Transvaal, Orange River Colony, and Bechuanaland, and the directors consider it represents a most valuable asset. A marked feature of the year has been the rise in land values, farming operations having been more successful than ever before. The African and European Investment Company possesses large share interests, which are taken into the balance-sheet at £691,634, and the quoted securities have been writeen down below their market value. The company has acquired a substantial interest in the Rhodesia Gold Mining and Investment Company, whose principal assets are shares in the Lonely Reef, Cam and Motor, and Sabi Gold Mining Companies. With markets so inactive the African and European Company could not be expected to make a good showing, but so soon as there is a revival in mining shares the company should be able to quickly place a better complexion on its profit and loss account.

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The Quarter at the East Rand Proprietary.

Working expenditure at the East Rand Proprietary Mines amounted to £500,108, working profit to £285,876, and revenue to £785,985, during the quarter ended June 30 last. There were mined 529,514 tons, and crushed 473,250 tons. On the basis of a ton milled the revenue works out at 33s. 2d., expenditure at 21s. 1d., and working profit 12s. 1d. per ton. It is of much interest to contrast these results with those secured in the preceding quarter. A comparison shows that the tonnage milled was slightly higher, the recovery per ton greater by 1s. 9d., the working costs 5d. per ton lower, and the resultant profit was greater by £41,136 in the aggregate. From the profit there must be deducted approximately, £50,798 to meet the quarterly proportion of the Government profit tax, interest on debentures, etc. It is, further, stated that the expenditure on "authorised votes" for the three months was £55,032. The actual expenditure on development amounted to £38,304, as against £70,987 provided in the working costs (at 3s. per ton), leaving a balance of £32,683, which, added to the balance at the end of March, gives a total of £70,549 standing at the credit of development suspense account at the end of June.

TOPICS OF THE WEEK.

OUR SPECIAL "MAJORITY" NUMBER.

The finishing touches are now being put to the Special 21st Anniversary Number of the *South African Mining Journal;* and within a few weeks we hope its striking grey and gold cover will be a feature of the bookstalls. Whether the high ideal we set before ourselves when the issue was planned has or has not been realised, we must leave the reader to judge. A few words on the policy that has guided and informed the whole may, however, be necessary to enable the reader properly to appreciate the work and its attendant difficulties. It was felt at the outset that if the whole field of South African mining and the commerce and subsidiary industries reared thereon were to be reviewed, there was a real danger of sacrificing the interest and attractiveness of the treatment to a mere passion for comprehensiveness. Therefore, it was resolved to have each phase of the mining industry and the rest dealt with by specialists—men who had something new to say where possible, and where novelty was not possible, possessed at least of the saving merit of authority. Too often ambitious annuals and much "boomed" special numbers resolve themselves into wearisome and ponderous masses of wholly indigestible summaries of facts. That danger to the merely industrious compiler we studiously sought to avoid. Instead, we have attempted to make the issue a landmark, a fresh starting point as well as a finishing post at the twenty-first mile of the journal's connection with South African mining. It is true that tribute has been paid to the insatiable demand for records, histories, reviews and the marshalled cohorts of statistics. These things have been done—it is hoped they have not been overdone—but they are not, and do not pretend to be, the features for which the number will be welcomed or remembered. The globular figures, graphically expressed, which portray mineral outputs, ore reserves, dividends, expenditure on machinery and on wages, furnish Rand mining with, perhaps, the finest advertisement that any industry has ever enjoyed. Too many, however, have treated of these things, and too many among the scribes and statisticians have succeeded in treating them so excellently that they have no claim on the public interest beyond their spectacular significance. Not in any of these "bread-and-butter" lines will the main interest and value of the issue lie. Rather do we pin our hopes to the thought-compelling contributions on different aspects of industrial activity supplied by men whose names are a household word throughout three continents; to the pictorial presentation of the mining industry in all its branches; to our portrait gallery of the men who have made and are making mining history in this country; and to the very magnitude and impressiveness of the vast field of human endeavour reared on the foundation of mining, which our pages attempt to portray. It would be unfair and unwise to single out names, but it is enough to say that, had it nothing else, the success is assured of an issue that contains articles by Messrs. Alfred James, G. A. Denny, Sidney Jennings, Professor Stanley, in the sphere of metallurgy; of Mr. H. F. Marriott, Professor Lawn, Mr. J. A. Vaughan and

Mr. J. M. Calderwood in the world of mining engineering; of Mr. H. S. Harger, Mr. David Draper and Dr. Wagner in the world of geology; and of Lord Harris, Sir Sigmund Neumann, Mr. Gustav Imroth, Sir David Harris and Mr. K. G. Fricker in the world of finance. Other experts, only just less well-known and distinguished, are responsible for "rounding off" the issue; and the treatment of every subject has, therefore, the outstanding advantage of freshness, diversity and originality. If the treatment of the Rand is marked by some novel features, and has neither the abnormal length nor prolix repetition familiar in works of this sort, the fact, we believe, will win favour for us with the reader. A too liberal use of pictorial illustration there may be, but the fault, we believe, is in the right direction. Short of actual treatises on metallurgy, no more complete, certainly no more authoritative account of Rand ore reduction processes, their history and progress, has ever appeared. A galaxy of brilliant writers, who are also famous scientists, are responsible for this section. Of Rand mining proper, a big feature is made; and the men who deal with it are men who have won through to the top of the tree in their profession. Nor are the outside districts neglected. To those Cinderellas of the industry the *South African Mining Journal* has always played the part of fairy godmother, and their prospects have occupied a comparatively large share of attention in our pages. Rhodesia, Zambesia, Manicaland, German South-West Africa—all find a large and roomy niche in the structure. Diamonds, tin, coal and copper are dealt with as they deserve to be dealt with—broadly, generously, with a proper conception of the enormous part they are destined to play in the future of mining in South Africa. Where possible, the industries subsidiary to mining are accorded due treatment. Whole sections, moreover, are devoted to commerce, under the guidance of experts, to agriculture by some of our foremost writers on that fascinating theme, to banking by its leading authorities, to insurance and insurance companies by men who have the intricate facts of these great divisions of finance at their finger tips. Electricity, that many-engined revolutionary of modern industry, and such outstanding developments of engineering as automobilism find due place in the work, and, short of the easy comprehensiveness of an omnibus, nothing relevant to industrial progress in South Africa is ignored. Where omissions have occurred, or where a nice proportion has not been observed in allocating space, the reader's tolerance is craved. "There is a reason." If some phase of industry is overlooked, or some important point is ignored, be assured the blame must lie with the indifference, or apathy, or both, of those mainly concerned. We have done our best.

TRANSVAAL COAL-OWNERS AND THE OUTLOOK.

The recent reduction in railway rates directly benefited the gold mines, but did little to strengthen the hands of the Transvaal Coal-owners' Association in their struggle to build up an export trade. The Association, it may be remembered, was formed for the purpose of endeavouring to stop the cut-throat competition amongst the colliery companies, and not with any idea of unduly raising prices to consumers. All the Association has attempted to do is to steady prices with a view to obtaining for investors in colliery properties a fair return on money invested. One of the benefits of the co-operation has been to reduce working costs at the collieries, as the mines have been able to count on fairly steady outputs, and from this again the public has also benefited, as the collieries have been able, while making a profit, to sell at lower prices to consumers. An export trade and bunkering trade, also, can only be done satisfactorily by a co-operation of collieries. The coal mined in the Witbank district is practically uniform in quality, so that it is possible to draw from a number of collieries for the same shipment, thus expediting the business. If there were no co-operation, and coal were being sent to Delagoa Bay by each colliery for separate steamers, there would be endless confusion and delays. The Association has been endeavouring to build up an export trade through Delagoa Bay, that being the natural port for the shipment of Transvaal coal. There are large markets in India and the East into which Transvaal coal should be able to gain an entry and in which it should do a large business. The collieries have, even at a loss, sent trial cargoes to Indian ports, and the coal has been very favourably reported upon. It has been found, however, that Transvaal coal landed in India cost just about 2s. per ton more than the figure necessary to get a share of the trade, and the coal-owners have for a long time urged the Government to concede a reduction of 2s. per ton in railway rate to the coast. The Government has granted a rebate of 1s. per ton on coal for export, to take effect as from August 1, 1912, but it is clear that this cannot materially assist the collieries. A reduction of 2s. per ton in the railway rate would probably enable the coal-owners to secure large contracts in India, when, of course, cheaper rates of shipping freight could be obtained for regular shipments than have at present to be paid for chance steamers. It should be recognised by the Government that, while pushing the coal trade in Union ports, Delagoa Bay, although a foreign port, is the nearest and most natural outlet for the export of Transvaal coal, and that the bunkering of steamers with Transvaal coal at Delagoa Bay should also be pushed for the benefit of the Transvaal. It will be remembered that some time ago, on behalf of the Railway Board and the collieries, Mr. Gordon Sandilands visited all the Eastern ports with the object of finding markets for Transvaal coal, and extracts from his report appear in this issue. He estimates that Bombay and Karachi purchase annually about two million tons of sea-borne coal, and, provided our price was satisfactory, a considerable and increasing tonnage of Transvaal coal could be sold. To summarise the position, it may be said that the East African trade north of Delagoa Bay is at present very limited, but likely to increase at an early date, as timber adjacent to the railways is becoming scarce and expensive. If the Transvaal is to secure any of the trade in the Indian Ocean, a further material reduction in railage is essential. The collieries have expended large sums in trial shipments and the coal has proved satisfactory—price alone nullified their efforts. Indeed, the whole question of the future of the export of coal from the Transvaal coal fields is in the hands of the Railway Administration. There is no hope of such a trade being established unless the railway rates on coal are reduced to a figure which will allow of Transvaal coal being placed on the Indian market at an attractive price. All other essentials are present—a good coal, a regular supply, backed up by sound guarantees. Great efforts were made by the first Association to endeavour to secure a portion of this Indian trade, and high hopes were entertained, but the results have proved that while everything else was favourable the price was excessive. All the points of expense were examined, and the only item which can be materially reduced is the railway rate. If a reduction can be effected, there is before the Transvaal coal fields an era of prosperity which would naturally be reflected in the country. The question of reduction of the rates should be considered on the broadest possible lines—of the great benefits which will accrue to the country generally, rather than on the single point of railway economy. There is a market for the coal and every effort must be made to open this market for the benefit of the Transvaal.

THE DERDEPOORT GEOLOGICAL PROBLEM.

Volcanic Breccia or Kimberlite—Insufficient Evidence of Peridotite— Further Information Desirable.

Expert opinion still appears to be considerably divided upon the question of the hour in diamond mining circles, that, namely, of the true petrological character of the hard blue micaceous rock, resembling hardibank, which is said to constitute the greater portion of the reputed claim area of the Derdepoort Mine. This area, according to reliable accounts, is of unusually large dimensions, compared to that of the Premier Mine—the greatest Kimberlite occurrence known—at the surface. The latter was estimated at 3,280 claims in November, 1904, but the area of the supposed diamondiferous ground at Derdepoort is stated to be well over 5,000 claims. Obviously the important points to be ascertained are whether the rock under discussion is actually Kimberlite, and if it carries diamonds in payable quantities. It will be difficult to obtain any very reliable evidence with regard to the latter point just yet, for the rock is hard and not easily susceptible to weathering, and a crushing plant will be necessary to deal with it adequately. The other matter, that of the character of the rock, from a petrological point of view, is, as we have previously remarked, one that should easily be decided by means of microscopic investigation. Some confusion seems to have arisen out of the statement of the Geological Survey, that a large mass of volcanic breccia exists in the neighbourhood where diamonds are said to have been discovered in yellow ground, and it has been assumed that the owners of the claim area have taken in all this stretch of breccia, and taken it for granted that it is actually Kimberlite. There is a good deal of this breccia in the surrounding district, according to Mr. A. L. Hall, of the Geological Survey, who described it in the annual report of the Department for 1903. There is, for instance, a large mass of it on Roodeplaats, several miles to the north-east of the Derdepoort occurrence, and Mr. William Bleloch is at the moment busy exploring it for diamonds. In discussing the volcanic rocks of the country near Pretoria, and east of the Pretoria-Pietersburg railway line, Mr. Hall groups them under the general term, felsites, of which he says:—

Volcanic Breccia.

"This term includes here a variety of volcanic rocks, such as rhyolites, tuffs, felsites, porphyries, andesites, breccias, etc., which form a gentle continuous feature encircling the low-lying shale on both sides of the Pienaars River. . . . . It is not possible at present to attempt separating these various types in the field, and reference will be made here to the commonest varieties only. . . . ." Of the breccias he remarks:—"Two well-defined breccias were found and separated from the main mass of felsites. The larger of these forms a well marked feature on the road leading from the northern norite boundary across the Pienaars River on the farm Roodeplaat. It follows an east to west trend, crossing the Pienaars River and extending for a total length of about two miles. The best exposures are seen close to the dwelling houses about a quarter of a mile before the road reaches the drift on Roodeplaat. Angular fragments predominate, and many of them are made up of portions of red porphyry alluded to. In addition, there are fragments of red granite, black altered shale, siliceous rock, particles of fluorite, etc. In size the fragments vary from over a foot down to an inch or less in diameter. Among these included fragments a peculiar, almost black rock was noticed, containing crystals of fluorspar, and studded with small vesicles filled with white quartz and zeolites. Very probably this is a fragment of the Bushveld amygdaloid." At Derdepoort a similar breccia was observed, with regard to which Mr. Hall says:—"Breaking through the Magaliesberg quartzite at Derdepoort and cropping out in the small spruit on the west side of the poort, and on the gentle little kopje immediately to the east of the spruit occurs another volcanic breccia. In all probability it has the same origin as the other occurrences mentioned above, but in certain respects it differs markedly from them. There are the usual angular fragments of red granite, quartzite, and dark shaly material, with an occasional crystal of biotite. But we can notice a good deal of calcareous rock, having the appearance of veining the breccia, and not showing any fragmental characters."

Is There Peridotite?

This volcanic breccia, to judge from the descriptive extracts just quoted is not the hard blue rock, with the appearance of a very micaceous hardibank, which forms the "blue ground" of the Derdepoort Syndicate. In no part of the report do we find rocks referred to which in any way resemble that in question. One can only come to the conclusion, therefore, that it was overlooked by the survey. That does not by any means settle the question, however. We have reliable information to the effect that the rock has been examined in a microscopic section and the opinion formed with regard to it is that, whatever else it may be, it is not peridotite. If it is not a peridotite, it follows that it is not Kimberlite, as geologists understand the term. Curiously enough, Mr. F. M. Krause, who reported upon the occurrence for the Vilma Diamond Company, several months ago, made a point of the petrography of the rock, for he distinctly states that the stratified rocks are traversed by an intrusive body of peridotite. The apparent area occupied by this peridotite was given by him as 1,200 yards by 120 yards, or over 4,000 claims. "A prominent feature of our peridotite," he adds, "and one which distinguishes it readily from the Kimberlites of other localities in the Pretoria district, is the profusion of large-plated magnesian mica it contains. . . . In its weather condition ('yellow ground') the peridotite has a greenish to greyish yellow colour, is earthy or friable near the outcrop, but becomes harder in depth. Of its component minerals none but mica and ilmenite are microscopically recognisable." He speaks of a diamond weighing about half a carat having been found in the yellow ground and several smaller stones from another pit. Foreign enclosures of hard peridotite diabase, quartzite, schist, and granite, were described as having been taken from the yellow ground. "Ilmenite (in part magnetite) is usually present, though not plentiful; garnet occurs in minute grains hardly discernible with the naked eye. White and purple calcite, very abundant in places, is probably secondary, and, in view of the scantiness of lime in the normal type of rock, is no doubt derived from an extraneous source. Fresh olivine is absent from the specimens I have examined, but is, I am informed, commonly found in the concentrates of washings."

Not Proven.

There is no evidence here of any microscopic investigation having been made, and the name peridotite appears to have been given to the rock from the evidence afforded of hand specimens. There is nothing in the report, in a word, to upset the opinion of the geologist who is reported to have declared that it is not peridotite. The question may perhaps be regarded as an open one. The existence of diamonds in the decomposed rock is maintained, but that does not go very far towards helping us in the matter of its petrography. Diamonds have been found in diabase, according to reliable accounts. The conclusion to be arrived at as a result of the uncertainty in which the whole problem is involved, as is indicated in the foregoing remarks, is that neither the existence of Kimberlite nor the existence of diamonds in payable quantities have been proved, and that the evidence in favour of either of these conditions is not of a particularly convincing kind. Further prospecting operations and a careful examination of the rock, not by diamond miners so much as by geologists, seem to be desirable in view of the market and other dealings which are said to have taken place in the shares, at considerable prices, by the way.

THE FUTURE OF THE MODDER B.

Substantial Improvement— The Question of Increasing the Reduction Plant.

Taking the monthly returns of the Modder B Company, as declared in the April, May and June reports, the profit earned last quarter amounted to £91,719, whereas the amount earned for the first three months of the year was £71,081. The improvement is very substantial, and serves to direct an increased measure of attention to the potentialities of this great mine. The June output was £60,067 from 32,100 tons milled by eighty stamps and five tube mills, and the average grade on recovery thus works out at but little under £2 per ton. In the last annual report Mr. H. Stuart Martin, the consulting engineer, stated the ore reserves at 2,355,700 tons, at 7·5 dwts. per ton stope value over 51 inches. Clearly, then, the company is milling ore of a value substantially in excess of the average value of the ore reserves, and this fact is of not a little importance and interest. It may be recalled that at the annual meeting held on June 1, Mr. R. W. Schumacher, who presided, said: "I must add, in answer to inquiries that I have received from shareholders, that our engineers consider the monthly profit is not likely to fall very considerably owing to the large reserves of rich ore. At the same time, recent profits must be regarded as abnormally high on the basis of the tons milled." He also stated that it is not possible to determine or control closely the grade when working such large blocks of ore as the company are now doing, and "it is almost certain that there will be fluctuations from time to time. Our business, in the circumstances, is not to endeavour to work too closely to any specified grade as long as the ore we mine is distinctly payable." The Chairman, furthermore, remarked: "We are still somewhat short of labour, and have not sufficient to carry on all the development work that we should like to do. When conditions are more favourable, we intend to open up the eastern portion of our large property, which to-day is comparatively unexplored, and also to push down our workings rapidly in the rich zone on the western side. We shall then be able to make a more accurate forecast of the possibilities of this important mine, and will shape our policy accordingly." One is not able to draw any new inferences from this latter statement, because it has all along been recognised that the proper course for the company to pursue is eventually to increase, and increase largely, the present reduction and treatment equipments of the company. In his last annual report, the consulting engineer wrote: "The grade of ore mined and crushed to date is higher than the average value of the ore reserves, because a large proportion of the stopes that are in a condition to produce most ore are in the richest blocks. For this reason a portion of the profit derived from the working of the faces at present available has been placed to gold reserve. The policy of opening up the richer blocks first is clearly preferable to that of incurring a large liability in opening up all stopes in the mine prior to milling, that is, just at the time when the work can be done with the least economy. Further stopes are being opened up as rapidly as circumstances permit." It is clear from the foregoing remarks that in the future the Modder B will be milling ore of lower grade value than has to date been crushed, but this by no means assumes a shrinkage of profit. On the contrary, the Modder B may be relied on to earn much larger sums in the near future, and this mainly through the instrumentality of a greater plant. The present equipment of eighty stamps and five tube mills is quite inadequate for a mine of the size of the Modder B, and the intention is ultimately substantially to increase this plant. It is probable that for a start the erection of a further eighty stamps at the back of the present heads and additions to the tube mill plant will suffice, but it is understood that the quadrupling of the reduction and treatment equipments has already been considered. This would bring the complete installation up to 320 stamps and 20 tubes. There is, so we learn, no immediate intention of proceeding with this programme of expansion, and, in fact, it is probable that some time will elapse before it is given effect to. It is, however, certain that the Modder B is at an early date destined to become one of the largest producers and profit-earners on the Rand.

DWYKA CONGLOMERATE IN THE KLIP RIVER VALLEY.

[By David Draper, F.G.S.]

The following notes relating to the existence of dwyka conglomerate in the Klip River Valley was communicated to the Geological Society of South Africa at the last monthly meeting. It will be of interest in view of the reference to the subject in the paper on the Zuurbekom boreholes by the same author which was published in our last issue:—

"As is well known, there are evidences of the existence of dwyka conglomerate, underlying the coal measures on both Syferfontein and Zuurbekom, though the discovery of typical dwyka in the past of the country has hitherto not been recorded. Through the courtesy of the Rand Water Board, I have recently been permitted to examine their works on the farm Misgund No. 56, where a shaft is being sunk at present for water. The spot selected is near the southern boundary of the farm, on the western side of a creek which rises on the farm Elandsfontein, and the shaft is about 110 feet in depth.

"About four hundred yards to the westward of the shaft there is a sink hole in the dolomite, about seventy feet in depth, containing a large quantity of water, and it was with the hope of tapping an auxiliary supply that the shaft was sunk. A section through the sink hole, which is named the 'Cat's Eye,' and continued through the shaft into the adjoining valley, shows an abrupt change in the strata. At the 'Cat's Eye,' chert breccia, resting on dolomite, is in evidence, whereas the shaft, only four hundred yards distant, is entirely in dwyka conglomerate to the depth attained at the time of my visit, and again further eastward dolomite and chert outcrops on the surface.

"Taking this rapid change of the strata into consideration, together with the thickness of the dwyka conglomerate, I am under the impression that the patch of glacial formation has been lowered into its present position by a sinkage of the dolomite, and is not representative of a valley filled with boulder beds, as is the case in the dwyka occurrences in the High Veld.

"Among the rounded boulders which have been taken from the shaft, many could be identified as belonging to well-known rocks of the Witwatersrand and Ventersdorp series. Conspicuous among these was a piece of typical Hospital Hill quartzite, several pieces of unmistakable Black Reef quartzite, and weather boulders of Klipriversberg diabase. From these evidences it may be assumed that the glaciar which transported these boulders from their original home to their present resting place travelled down the Klip Spruit and then followed the Klip River Valley. When the beds underlying the dwyka in the shaft have been struck, the total thickness of the former will be communicated to the Society. At present the shaft is still being sunk in dwyka."

PROGRESS OF THE BARNATO GROUP.

Much Improved Profits—A Generally Satisfactory Outlook.

Six of the seven productive subsidiaries of the Barnato group record higher profits for the quarter ended June last than were announced in respect of the operations for the preceding three months. The following table sets forth the salient features of the earnings:

Witwatersrand	£57,871;	increase	£8,913
New Primrose	53,569;	increase	2,525
Consolidated Langlaagte	27,730;	increase	3,367
New Unified	15,357;	increase	1,214
Ginsberg	20,483;	increase	2,380
Glencairn	8,534;	increase	762
New Rietfontein	11,427;	decrease	1,032

The most noteworthy advance is recorded by the Witwatersrand, or "Knights," which, as forecasted in the chairman's speech, is showing much improved results. The quantity of ore crushed was increased by 12,470 tons as compared with the tonnage milled during the previous quarter, and working costs were reduced by 1s. 4d. per ton. As a result there was a considerable improvement in the gross profit realised, which was higher than that for the first quarter of the year by £8,943. The vertical shaft was sunk 333 feet, and has reached a total depth of 1,636 feet. The northern incline shaft was sunk 126 feet to a total depth of 1,024 feet. The development of the section of the mine served by this shaft continues to expose reef of satisfactory value, and, considered as a whole, the positon at the mine is most encouraging. The amount expended on shaft sinking and equipment of the southern section amounted to close on £20,000. The ore developed on a milling basis came to 97,595 tons, and the ore crushed to 118,180 tons.

At the New Primrose it was found possible to increase the quantity of ore crushed, with the result that the tonnage milled was higher than that for the previous quarter by 3,000 tons. This was directly reflected in the profit realised, which shows an increase of £2,525. Working costs have been kept at a low figure, and the grade of the ore has remained remarkably steady. With a view to improving the extraction, it has been decided to erect a tube milling plant, and arrangements are in hand for the installation of two tube mills. Here ore crushed exceeded ore developed by approximately 14,000 tons.

The New Unified crushed 32,160 tons and developed 27,754 tons. The larger profit was due to an increase in the quantity of ore milled of 750 tons, and a reduction of over fourpence per ton in the working costs. The tube mill has run very satisfactorily throughout the quarter, and the residues have been reduced to a low figure. The main incline shaft was sunk 75 feet to a total depth of 2,638 feet. The shaft has almost reached its final depth, and the driving of the bottom level of the mine will shortly be put in hand. The values exposed as the result of development operations continue to prove satisfactory.

The quantity of ore crushed at the Ginsberg was increased by 2,988 tons, and working costs were reduced by sixpence per ton. As a result, the gross profit showed an increase of £2,380 as compared with that realised during the previous quarter. The tube mill plant continues to give satisfactory results. The north shaft was sunk 87 feet, to a total inclined depth of 1,511 feet. No driving is being done at the present time, but winzing and rising through certain blocks is proceeding; a certain amount of crosscutting has been carried out during the quarter in what were looked upon as very poor sections of ground, with the result that better leaders have been found than those originally driven on. On the whole, the position at the mine is encouraging.

At the Glencairn Main Reef the quantity of ore milled shows an increase of 4,270 tons, as compared with the tonnage crushed during the previous quarter, and the total gross profit is higher by £762. A certain amount of prospecting work is still being carried out, and a surface winze on the South Reef in the Knights tribute section has disclosed an unworked block of ground of fair value.

The New Rietfontein is the only subsidiary of the group to show a lesser profit. Here the tonnage crushed was lower than that for the previous quarter by 3,200 tons, and as a result the gross profit was reduced by £1,032. No. 1 shaft was sunk 53 feet, and has reached an inclined depth of 1,473 feet. Reef of satisfactory value has been exposed in the 12th level west drive, which has now reached a distance of 579 feet from the shaft.

There was an increase in the working costs of the Consolidated Langlaagte Company, but as against this the grade of the ore milled was about half a dwt. better, with the result that the revenue from gold was increased by over two shillings per ton. The profit from the accumulated slime was also higher than during the previous quarter. The east shaft was sunk 214 feet, and has reached a depth of 36 feet below the 8th level station, and a total depth of 2,376 feet. The west shaft was sunk 142 feet, to a total depth of 2,456 feet, which was 238 feet below the 8th level station. Driving at the plane of the 8th level has been started at the west shaft, and at the east shaft a crosscut south is being driven to intersect the reef. The total development footage accomplished at the southern section amounted to 5,133 feet. At June 30th the ore reserves at this section stood at 1,921,116 tons, which have been classified as follows: Payable, 1,439,840 tons of an average assay value of 8·47 dwts.; unpayable, 481,276 tons of an average value of 2·30 dwts. The new reduction plant was completed and ready to start on July 1st, but unfortunately the Victoria Falls and Transvaal Power Company, Ltd., has been unable to supply the necessary power, and until this is forthcoming it will not be possible to run the new mill. In the meantime milling with the old plant is being continued. The Power Company has indicated that it will probably be able to supply the necessary power to run the new plant by the middle of September.

Rand Klip.

Sinking was carried out continuously at the east shaft of the Rand Klip during the quarter, the footage being 259 feet 6 inches—making the total depth at June 30th, 1,857 feet. On July 7th the reef was cut at a depth of 1,804 feet 6 inches, and having a dip of approximately 8 degrees. The average reef width exposed is 54 inches, the average value being 2·18 dwts. The sinking of the shaft is being continued in the footwall shale, to provide a sump. Driving on the reef to the eastward and westward will be commenced immediately the main station is cut, and the sinking of the incline shaft will be started as soon as possible. Adequate arrangements are being made at the bottom of the shaft to handle any extra water met with in further operations up to 10,000 gallons per hour. There has been an improvement in the supply of native labour during this quarter. The net expenditure for the quarter on shaft sinking, equipment and general charges amounted to £12,855 18s. 8d.

Geldenhuis Deep.

The following cable has been despatched to the London office of the Geldenhuis Deep, Ltd., and is published for information: "There will be a loss of one week's hauling at No. 2 shaft this month, due to several accidents and necessary change-over to new headgear. Position aggravated by temporary shortage of native labour. Tonnage and profit for the month of July will show serious decrease."

GENERAL MINING PRODUCERS.

Greatly Improved Results During the Past Quarter—Cinderella Consolidated and West Rand Consolidated Do Much Better—A Review of the Three Months.

THE aggregate working profit of the productive subsidiaries of the General Mining and Finance Corporation for the quarter ended June 30th amounts to £211,853 5s. 5d. Contributions of individual companies to this total and comparisons with the profit earned in the preceding three months are appended:

	£	s.	d.		£	s.	d.
Aurora West	£8,750	16	7;	increase	£860	1	1
Cinderella Cons. ...	16,121	6	10;	increase	8,063	11	6
Meyer and Charlton	51,382	0	6;	increase	4,910	11	1
New Goch	11,308	0	8;	decrease	354	11	7
Roodepoort United...	13,129	19	11;	increase	958	11	11
Van Ryn	90,563	14	0;	decrease	2,693	6	9
West Rand Con. ...	17,597	6	11;	increase	7,140	14	9

In comparison with the preceding quarter, the very satisfactory increase of £18,885 12s. is to be recorded. Particularly gratifying are the large and substantial improvements recorded by the Cinderella Consolidated and West Rand Consolidated. In the case of the former concern the profit is just double that declared in the previous quarter, whilst the West Rand Consolidated Company's earning is approximately 90 per cent. better. The yield per ton milled at the West Rand Consolidated for the past quarter is higher by 3s. 2d. as compared with the previous quarter. This improvement is due partly to the larger percentage of sorting now practicable by reason of the improved native labour position, but mainly to the stope values in certain sections of the mine being considerably higher than indicated by the development assays when the ore reserves were compiled at the close of the past year. In will be observed, too, that the Aurora West, Meyer and Charlton and Roodepoort United Main Reef also record better profits.

POSITION AT THE VAN RYN.

The largest decline is that of the Van Ryn—£2,693 6s. 9d. The erection of the new steel headgear and electric winding plant at No. 2 shaft will be completed about the middle of August. The installation work in connection with the new plant will entail a suspension of hoisting at this shaft for a matter of ten days or a fortnight. In order to obviate as far as possible any decrease in the normal tonnage of ore treated at the mill during the stoppage, a surplus supply of ore has been and is being hoisted and dumped at the surface. The shortfall in the revenue and profit for August is therefore unlikely to be appreciable.

FOOTAGE.

At the Aurora West 3,276½ feet were driven, sunk and risen during the three months. At the Cinderella Consolidated the total was 4,176 feet. 149 feet were sunk in the central shaft, making a total depth of 2,026 feet. The small footage accomplished during the quarter is due to the very great difficulties encountered; the ground passed through required the greatest care in close timbering, whilst it was not until the end of the quarter that there was any appreciable diminution in the quantity of water met with. Permanent pumps have been installed at the 1,000 feet pump chamber, and the work of cutting the pump chamber at 2,000 feet horizon has been commenced. The Meyer and Charlton Company's footage amounted to 1,374 feet, that of the New Goch to 1,807 feet, and at the Roodepoort United Main Reef, where a comprehensive development scheme is being carried out, to 5,715 feet. The Van Ryn management achieved a total of 6,175 feet, which is 151½ feet in excess of the footage driven during the March quarter. The most westerly subsidiary of the group—the West Rand Consolidated—drove, sunk and rose 4,140 feet. Capital expenditures were as follows: Aurora West, £3,154 17s. 9d.; Cinderella Consolidated, £41,707 2s. 8d.; Meyer and Charlton, £2,850 16s. 10d.; New Goch, £1,591 17s. 4d.; Roodepoort United, £12,209 9s. 6d.; Van Ryn, £9,100 17s. 6d.; West Rand Consolidated, £11,692 3s. 6d.

REVENUE, COSTS, ETC.

Revenue, working expenditure and working profit on the basis of a ton milled were, at the different subsidiaries, as follows:

	Revenue.			Costs.			Profit.	
	s.	d.		s.	d.		s.	d.
Aurora West	24	1	...	20	0	...	4	4
Cinderella Consolidated ...	29	11	...	24	2	...	5	10
Meyer and Charlton ...	42	8	...	18	2	...	24	6
New Goch	20	10	...	17	3	...	3	7
Roodepoort United ...	20	1	...	17	3	...	2	10
Van Ryn	27	9	...	15	7	...	12	2
West Rand Consolidated	27	0	...	22	8	...	4	4

MILLING RESULTS.

As to tonnages milled, equipments worked and stamp duty the following interesting figures may be advanced:

	Tons.	Stamps.	Tubes.	Tons per Stamp per day.
Aurora West	40,744	70	—	6·466
New Goch	79,008	120	4	7·921
Roodepoort United	94,038	50-60	3·5	19·751
West Rand Consolidated...	81,500	100	4	11·702
Van Ryn	116,050	125	6	10·954
Meyer and Charlton... ...	42,005	75	2	6·537

The past quarter's results may be adjudged quite satisfactory. The decreases in profits are largely overbalanced by the improvements, and in regard to the New Goch it is encouraging to learn that the underground position is now such that an early improvement in profits is fully anticipated.

Kroonstad Coal Estate

The directors of the Kroonstad Coal Estate Company, Ltd., have declared a dividend of 5 per cent., payable to shareholders registered on June 30th. Warrants will be ready for issue after July 31st.

City and Suburban.

The report on the operations at the City and Suburban for the three months ended June 30th shows that from 81,038 tons crushed 36,918·818 ozs. of fine gold were recovered, the revenue from which was, inclusive of £519 underestimated in the previous quarter, £154,747. Working expenses absorbed £90,318, or 22s. 3·483d. per ton, which left a profit for the quarter of £64,428, or 15s. 10·81d. per ton. Capital expenditure for the three months amounted to £824. On development work the number of feet driven, sunk and risen, exclusive of stopes, was 2,085 feet. The reef disclosures were as follows:—

	Distance Exposed. feet.		Width. inches.		Assay Value. dwts.
Main Reef	471	......	34	......	9·4
Main Reef Leader...	763	......	24	......	13·3
South Reef	447	......	28	......	12·8
Totals and averages	1,681	......	28	......	11·8

The tonnage stoped, including ore obtained from developing faces, was 91,193 tons.

NATAL v. RAND NATIVE LABOUR MARKET.

Planters Take Action—Details of the Scheme —Organization to Fight the Rand—50,000 Mine "Boys" Said to be Involved.

Natal sugar planters met last week to discuss how they would keep Natal natives from going to work on the Rand. We believe they might as well attempt to stem the flowing tide on Durban beach. Mr. J. Kirkman submitted the report of the Committee appointed to consider proposals for the formation of a labour association as follows:—(1) That the Association be called the Executive Board of Associated Employers of Unskilled Labour. (2) That the first duty of the Board be to acquire a knowledge of the laws relating to contracts of service of natives, to recruiting, to making contracts by agents, to advance and recovery of money on account of wages. (3) That the Board submit a scheme: (a) For the appointment of agents in such centres as may be agreed upon, such agents to have as their duty the explanation to natives rates of wages, character of work, and districts in which employers require them to work, and other matters likely to facilitate the retention of native labour in Natal; (b) For rules regarding rations, quarters and wages, having in view the different classes of work; (c) for the appointment of confidential agents to interview chiefs and to send deputations when needful to Government or Government officials; (d) for advising employers as regards legislation and political questions bearing on labour; (e) for the preparation of estimates of cost of depots at various centres and as regards the necessity of such depots; (f) for the appointment of inspectors if deemed needful, and for the ensuring of reasonably good terms between employes and employers. (4) That after information has been obtained and Associations having been reported to, steps be taken to carry out indents for labour on the following basis:—(a) Deposit on the first indent of £2 per head; (b) indents to be opened and examined by the Board with a fixed quorum present; (c) all indents to be treated alike as to priority of distribution, the principle of turn and turn about being employed as the principle of distribution, and the Board to have complete control of distribution; (d) powers not laid down for the Board at formation to be assumed when agreed to by a two-thirds majority of a Board meeting called for the purpose, provided that the new provisions are reported to the Association as early as possible for confirmation; (e) procedure of the Indian Immigration Board to be carried out as far as practicable in matters concerning instalments and recovery of same; (f) terms with agents to be fixed by the Board, and reported to the Association for confirmation; (g) the Association to be registered under the laws in force in the Union, or Province as the case may be; (h) sugar interests to elect six members to the Board through the Sugar Association (coal interests to elect four members, tea interests two members); (i) all members of the Board to be paid £1 per day when doing Board work, and that a secretary be appointed and office fixed. (5) Provided necessary arrangements are made for the establishment of the regular Labour Board, the election of the Board will take place in January, 1914, under rules to be drafted by the preliminary Board. These rules shall give right of voting for Board members to all employers who may have availed themselves of the services of the preliminary Board, and are otherwise eligible.

Natal Labour Association.

(1) Your Committee begs to report that the proposals for the formation of a Labour Association on lines laid down in circular issued in November last, which anticipated the support of the manufacturers and farmers, are not now feasible on account of the manufacturers having withdrawn from the scheme and the Natal Agricultural Union having decided to again refer the subject to its affiliated association in view of difference of opinion regarding the financial proposals. (2) Your Committee wish further to report that it had before it certain proposals made by Mr. John Kirkman, which are contained in the attached memorandum. Your Committee suggest that you should consider the proposals, and if you agree to the principles on which they are founded they advise that you should appoint representatives to a new Committee representing sugar, coal, tea, and wattle interests to go into details and report further to you on a scheme for carrying out the principles contained in the memorandum. In supporting the proposals of the Committee, Mr. Kirkman said that some 18 months ago the Association passed a resolution that they should endeavour to work together with other industries with regard to the question of obtaining unskilled labour. They had tried to bring the general farmers into the scheme, but in the end they decided not to do so. The Committee met about a fortnight ago, with the result that the report was drawn up which was now before them for acceptance. Personally, he was convinced there was much labour now going to Johannesburg which could be kept in the Province, but to do that they would have to provide the men with better quarters, and give them an occasional ration of beef. Some 50,000 natives left Natal to go to the Transvaal last year, but the majority of them would have been better off in Natal on an estate at £1 a month, and they were beginning to find that out. The native got, say, £3 on the Rand, but there were so many deductions that he believed that by paying 30s. a month, or so, they could get all they wanted. They proposed to have agents at the more important magistracies, who would point out to the natives the advantages of staying in Natal. Such agents would have to be armed with a power of attorney, for then if an advance was given the native this could be registered, and they would have a hold on a boy. He knew of one estate which was using 120 natives in place of 20 last year, and they reported that there was not the slightest difference between the work they did and that of the best coolies, and they found that by giving them an extra 5s. a month they got work to the value of an extra 10s. from them. He thought that they would find that the coal and tea interests would join in with them, and that they would be able to get satisfactory labour for less than the Indian now cost them. Mr. Townsend seconded, saying that he had found native labour most satisfactory this year, and he felt convinced that they had sufficient labour in Natal if it were properly handled. By giving the boys better housing and food he believed that they would have all the labour they required. Mr. Kirkman proposed the following Committee to carry on the work: Messrs. Townsend, C. Platt, Crooks, Colin Campbell, W. Pearce, and G. Wilkinson. This was agreed to.

Press and the Movement.

Discussing these proposals, the *Natal Mercury* significantly says:—

> In Natal, at all events, we know this to be the case. Partly on account of the necessity which has been placed upon employers in various forms of industry to look to indigenous sources of labour in place of the oversea importations stopped two years ago, and more largely, perhaps, on account of the changing instincts of the natives themselves, the labour of the kaffir is being more and more largely employed in local occupations, notably in those for which the Indian was formerly thought to be essential. Ten years ago it would have been considered a phenomenon almost beyond credibility that kaffirs should be engaged in cutting and weeding canefields. Such is the case to-day. There is no doubt that the sugar managements have very successfully applied themselves to the solution of the problem introduced into their labour affairs by the withdrawal of the Indian coolies, and in the measures they have been carrying out in order to make field-work attractive to the natives is probably to be seen a good deal of the developments that are taking place on the Rand with respect to labour. A native can earn from 30s. to 35s. a month on a Natal sugar estate, he has no railway fare to pay, he is near his home, he knows his employer, and he is becoming sufficiently self-conscious to estimate the advantage of being able to keep himself clear of demoralisations such as Johannesburg has made familiar to him. It is probably a fact that a clearer conception never existed than now of the extent of the practicable development of native intelligence. On the one hand, there has always been the inexhaustible sump of the Rand into which to drain the kaffir for the sake of his manual labour

pure and simple; on the other, there has been the Asiatic to perform the work which the native was on the spot to do, but which nobody ever conceived he could be induced to apply himself. Necessity has produced its surprises. The native is being recognised as a potentially efficient unit to certainly a larger extent than has ever been the case before, and it seems as though industrial South Africa in this one sense alone has entered upon a new era of history. Sympathetic encouragement of the new tendencies that are just awakening upon him of those influences to which he is always and most characteristically amenable—contiguity to his home, congenial employment, and by no means inferior to these, a very acute appreciation of his labour market—will tend to produce more out of what is commonly known as South Africa's great labour asset than all official coercion and plutocratic policy put together. The extent to which these principles are being recognised has marked evidence in the discussion which took places recently at the meeting of the Natal Sugar Association, on the proposal of Mr. John Kirkman, for the establishment of a body to organise the local supplies of unskilled native labour. Large numbers of natives, there is no doubt, still go to the Transvaal from Natal under inducements which, owing to unpaid arrears of taxes or monetary necessities of one kind or another, they are obliged to accept; while other causes operating include very largely the mere fact that the kaffir has as yet had no adequate approach made to him to accept labour which is offering almost everywhere at the door of his own kraal. Mr. Kirkman's suggestion strikes us as a very sound constructive proposal to this end, and in view of the developmnets on the Rand with respect to the native labour supplies for the mining industry, it will be seen that it is not untimely.

THE APPLICATION OF SCIENCE TO RAND MINING.

Value of Research Work—Preventive Medicine—Problems for the Chemist—Titanic Iron Ores—Views of Minister of Mines.

The Minister of Mines was, last Saturday evening, welcomed to a meeting of the Chemical, Metallurgical and Mining Society of South Africa. The President (Mr. Walford R. Dowling), in welcoming Mr. Malan, observed that the Minister was to be congratulated on the methods he was pursuing in obtaining information at first hand regarding the greatest mining fields of the Union. "As far as we are concerned," he said, "we will do our best to give him the correct kind of stuff." Mr. Dowling went on to express regret, as a South African, that South African youths were not taking as full advantage as they might of the facilities that were offered them of entering the service of the mining industry. Speaking later, however, Mr. Arthur Johnson challenged the expression of opinion, and said that his thirty-two years' experience had brought him to a directly contrary conclusion.

Cape and the Rand.

Mr. Malan said that he felt like a fish out of water at a gathering of specialists like the members of the society, and he gave them the assurance that he had come not for the purpose of instructing, but to be instructed. It had given him great pleasure to receive the society's invitation to attend the meeting, and he was glad to know that it was neither a meeting of directors nor a political meeting. "Coming from another part of the Union," he told the society, amid laughter, "I think I am expressing the popular idea there when I say it is that Johannesburg is a place of magnets, directors, gold-bugs, and rather stormy political meetings." Well, he proceeded, he appreciated the privilege of being among them and of giving them what encouragement he could regarding the work with which they occupied themselves. The society's pursuits were, he thought, intellectual rather than merely money-making. He knew it was composed of men who were practically engaged in chemical and metallurgical work in connection with the great gold mining industry, and that, therefore, to a large extent they tackled the problems that came before them from the point of view of the industry.

Truth for Truth's Sake.

That was as it should be, but he would advise them, if he might, not to lose sight of the more theoretical side, because the search after truth for its own sake, and not merely for the sake of earning a livelihood, was part and parcel of the national life of a country and a people. Without that no nation had ever attained greatness. On the more practical side, however, there was a wide field before them. There were two subjects on which, he thought, they all felt fairly strongly. One was the disease of miners' phthisis. They knew to-day a great deal more about the creation of rock dust and its effects on the lungs than up to quite recently, but the inquiry held in connection with the Bill that became law last session had impressed him very strongly with the idea that a great deal of investigation and research was still required before they could get at the bottom of the disease. To a large extent miners' phthisis was still a closed book, but he felt that if the society would, with the assistance of Mr. Johnson (who had given such valuable evidence before the Select Committee), tackle the problem and bring its collective thought, effort, and experience to bear, they would not have to wait very long before some marked progress was made.

Coming to his second subject, Mr. Malan said that in going through various mines and works another question of a different nature had been brought to his notice—the question of the white precipitate on zinc, preventing the precipitation of the gold. He dared say it would raise a smile, his venturing to mention a technical matter which must so often have engaged their attention. He was not going to attempt to say anything very startling about it, but it was a matter of very great importance to the industry, and the society could assist in finding a way out of that difficulty also.

Science Applied to Industry.

Dealing with abstract problems of science, as they did, they might do a great deal in other respects too. There was a time when it was believed that no organic substance could be produced chemically. Yet they knew what was being done to-day in the laboratories of Germany, and it was only the other day that Sir William Ramsay had urged a determined effort if British science was to be placed on a footing of equality with Continental. He referred, of course, to the discovery of the manufacture of synthetic rubber, which meant the creation of a vast industry. Here in South Africa they also required men to tackle problems in connection with industry and further mineral development. South Africa possessed not only gold. They had also vast fields of iron ore in the Transvaal and elsewhere in the Union, but up to the present this ore had, as it were, eluded all attempts to manufacture it into steel. If once they got a solution of the difficulty of removing titanium from iron ore they would have an industry in South Africa as great, if not greater, than the gold mining industry. Here, again, it was for the society to produce men whose investigations would assist in the solving of the problem.

Value of Pure Science.

"I appreciate very much indeed," concluded the Minister of Mines, "the work you are doing, and anything I or the department I represent can do to assist you will be gladly done. But I would again appeal to you to devote your attention not alone to industrial science, but also to pure science. I believe that the enthusiasm created in a man seeking truth for truth's sake makes him the more likely to stumble on truths of value in practical industry." Before sitting down Mr. Malan thanked the society for the honour done him in electing him an honorary member. He would, he said, value it as a remembrance of his connection with the Mines Department of the Union.

Dr. Macaulay's Criticisms.

Dr. Macaulay referred, at the outset, to the question of miners' phthisis, and pleaded for the early establishment of a research policy by the Government. He had urged the necessity of doing so upon the Government previously, and he now took the opportunity to emphasise the point. He felt that he was justified in asking Mr. Malan to use his influence with the Government, the Chamber of Mines, and the Witwatersrand Native Labour Association to see that the promised research institution was started at once. The Doctor proceeded to relate the details of a very interesting discovery recently made by way of research in connection with Beri-Beri. That disease, which they might have heard of through the Chinese stay on the Rand, had, he said, been a mystery for many years, and it had occupied the attention of scientific men in Dutch East India and the Malay Peninsula. That investigation had been going on laboriously, and it had resulted in the establishment of laboratories. During recent times it had been proved that the disease had been produced or caused by a more or less regular dietary of polished rice. The rice was that which was commercially prepared. The Doctor went on to show that the removal of the husk from the rice removed a certain medical preventative of Beri-Beri, a preventative which existed in such small ratio to a ton of rice as to offer a parallel to radium. By removing the husk and giving the polished rice remaining to human beings or to cows it was possible to bring about Beri-Beri. And then, when the subjects were almost at the point of death to restore them by giving them small quantities of the curative agent present in the husk. A means to cure Beri-Beri had thus been found. And he wished to draw the attention of the Minister of Mines to the fact, to show him what might be done by the establishment of a Department of Research to combat the diseases proper to this country.

TRANSVAAL GOLD MINING DIVIDENDS.

The Colossal Record of a Quarter of a Century—Twenty-five per centum of the Gold Won —Individual Contributions of the Various Mines.

The first Transvaal dividends from mining sources of which there is any record, apparently, were those of the Jubilee, Jumpers, and Wemmer, in the year 1887, the following being the facts as stated in the Chamber of Mines list:

Company.	Issued Capital.	Rate per Cent.	Amount of Distribution.
Jubilee	£12,000 15,000	25	£3,376
Jumpers	42,000	5	2,100
Wemmer	10,000 28,000	57	7,500
			£12,976

The Wemmer, as befitted its position at the very centre of what was afterwards to be the greatest goldfield in the world, made, it will be seen, a magnificent commencement, a circumstance that is little to be wondered at when the richness of the ore that was treated is taken into consideration. As late as 1891 the plate recovery from banket milled during the half-year ended September 30th averaged 19 dwts. 3·6 grains per ton. "The average assays of the tailings during the half-year," remarks Mr. C. S. Goldmann, in his well-known book on the Witwatersrand, "show 9 dwts. 18½ grains., whilst the milling assays show a loss of free gold of 15 grains per ton, so that the mineral as it came from the mine carried 1 oz. 22 1-10 grains per ton, and there was got from the mill upon the copper plates 66½ per cent. of the gold contained in the mineral." The company had so much gold that sands worth nearly £2 per ton were "tipped down into the empty stopes of the mine," in order to get rid of them. Some 1,522 tons were treated by the Adair-Cruikshank Company in 1891 and yielded 47 per cent. of their fire assay. The results doubtless gave the management and board of directors "furiously to think," for it is said by the writer just mentioned, after a reference to this early sand-filling enterprise, that "the plan has now been abandoned."

The Jubilee, lying within a stone's throw of the Wemmer, made a fairly good second in the dividend-paying way, and here, also, the astonishing richness of the ore near the surface made matters by no means difficult in this direction. Again referring to Goldmann, we find that at the east end of the mine, at the second level, or 160 feet, the South Reef was from 2 to 3 feet wide, assaying from 6 to 9 ounces. The Main Reef "is a body of ore from 6 to 8 feet wide, with a good leader, bulk assaying from 10 to 15 dwts."

The Jumpers, which came third on the somewhat brief list, had nevertheless the distinction of appearing amongst the first three companies to begin a period of dividend-paying by the gold mines of the Transvaal which expanded year by year, until, in 1909, it reached a record figure for the year of £9,523,518, and a total, from the beginning, of £65,955,574. Since then the process has been continued, until, at the end of 1911, the total sum paid in dividends by the gold mines of the Transvaal amounted to £83,171,296. The details of this enormous return are set forth below, together with a tabular statement showing the value of the gold yield, year by year. The dividend figures have been obtained from the twenty-second annual report of the Transvaal Chamber of Mines, and those relating to the output have been compiled by the statistical branch of the Chamber from the Government blue books:

Dividend List (Transvaal Gold Mines), 1887-1911.

	Dividend.	Gold Yield.
1887	£12,976	£169,401
1888	127,352	967,416
1889	461,644	1,490,568
1890	299,557	1,869,645
1891	355,600	2,924,305
1892	974,041	4,541,071
1893	1,042,539	5,480,498
1894	1,727,433	7,667,152
1895	2,218,402	8,569,555
1896	1,743,632	8,603,821
1897	2,956,981	11,653,725
1898	4,996,510	16,240,630
1899	3,211,766	15,452,625
1900	6,600	*1,481,442
1901	422,413	*1,096,651
1902	2,127,726	*7,301,501
1903	3,368,837	12,628,657
1904	3,938,802	16,028,883
1905	4,859,717	20,854,440
1906	5,741,761	24,616,704
1907	7,098,212	27,410,210
1908	8,757,882	29,986,469
1909	9,523,518	31,005,939
1910	9,130,958	31,995,266
1911	8,066,437	35,041,485
	£83,171,296	£325,127,075

*War period.

A comparison of the totals of the two columns in the table given below shows that approximately 25·5 per cent. of the value of the gold recovered has been paid out in the shape of dividends. At various periods the ratio between yield and dividend has swung more or less widely from one side to another of the average, particularly in 1909 and 1910, and obviously, by contrast, in 1911. The first of these three years not only produced the highest annual declaration ever made, before or since, but the ratio was the highest ever reached, being as 30·7 to 100, or more than 5 per cent. higher than the ratio of 1911. The details of the total of £83,171,296 are given here:

Company.	No. of Last Dividend.	Total Rate per Cent.	Total Amount of Distribution
Robinson	39	326	£8,955,938
Crown Mines	21	957½	4;760,812
Simmer and Jack Propy.	19	287½	4;116,461
Ferreira	36	4,415	3,919,250
East Rand Proprietary...	17	130	3,043,664
Ferreira Deep	17	327½	2,980,250
Robinson Deep	18	315	2,950,186
Crown Reef	40	2,404	2,867,900
Village Main Reef ...	22	590	2,581,543
Langlaagte Estate ...	43	494	2,543,580
New Primrose	37	762½	2,277,525
City and Suburban ...	24	398¾	2,159,913
Rose Deep	21	382½	1,916,125
Geldenhuis Deep	24	562½	1,881,990
Geldenhuis Estate ...	30	835	1,640,750
Witwatersrand Deep ...	12	285	1,495,093
Robinson Central Deep...	9	337½	1,485,000
Van Ryn	16	282½	1,344,500
Bonanza	16	662½	1,325,000
Durban Roodepoort ...	75	1,075	1,322,583
Angelo	13	333¾	1,231,648
May Consolidated ...	27	487½	1,399,100
New Kleinfontein	15	162½	1,226,125
Nourse Mines	14	167½	1,104,939
New Modderfontein ...	11	82½	1,072,500
Knights Deep	13	165	1,061,817
Meyer and Charlton ...	44	1,045	1,035,308
Witwatersrand	15	242½	1,000,625
New Heriot	35	912½	1,000,287 . 29
Wemmer	27	1,237	871,180
Driefontein Cons.	11	195	741,111
Henry Nourse	12	590	737,500
New Rietfontein	11	135	711,093
Roodepoort United ...	21	285	609,500

Company.	No. of Last Dividend.	Total Rate per Cent.	Total Amount of Distribution
Jumpers	26	590	576,500
Glen Deep	10	85	510,000
Randfontein South	3	25	500,000
✓Jubilee	80	1,215	495,479
Cason	3	93¾	492,188
Ginsberg	17	262½	477,375
Village Deep	7	45	477,303
Treasury	12	163⅛	469,025
Glencairn	14	107½	448,750
Wolhuter	8	60	443,000
✓Johannesburg Pioneer	30	2,107½	442,575
Porges Randfontein	7	70	342,500
Worcester Exploration	37	412½	338,037
Consolidated M.R.	7	37½	322,781
Jumpers Deep	7	57½	301,240
Consolidated Deep Levels	6	160	299,600
Langlaagte Deep	4	35¾	286,666
Main Reef W.	5	55	250,589
Salisbury	32	405	248,823
Rietfontein A.	7	70	237,688
S. Randfontein	5	50	225,000
Champ D'Or	11	167⅗	219,196
New Goch	5	37½	206,250
New Comet	5	52½	203,125
Princess Estate	8	72½	184,627
Langlaagte Block B.—			
Pref.	16	128	180,950
Ord.	2	12½	
Robinson Randfontein	3	30	180,000
North Randfontein	4	40	180,000
New Unified	7	60	150,000
Durban Roodepoort D.	5	32½	143,000
Stanhope	21	327½	109,670
New Chimes	13	115	95,049
W. Rand Consolidated	1	3¾	74,228
Orion	14	132½	65,750
Lancaster	2	20	65,105
East Anglian	3	230	64,400
French Rand	2	12½	64,250
Luipaardsvlei	3	15	59,760
Jupiter	1	5	50,710
Geldenhuis M.R.	4	30	45,000
Knight Central	1	5	45,000
Vogelstruis Estate	4	20	41,996
York	6	80	29,600
Langlaagte Royal	8	40	26,500
Windsor	1	20	20,000
Lancaster W.	1	10	19,500
Paarl Pretoria	1	25	18,750
Aurora	3	35	18,250
West Rand Central	3	17½	15,477
New Aurora West	3	15	10,000
Heriot	3	15	8,996
New Crœsus	2	10	7,500
Moss Rose	4	20	7,141
Vogelstruisfontein	3	15	6,750
Golden Kopje	2	7½	5,625
Meyer and Leeb	4	27½	4,075
Chimes	2	10	4,000
Royal	2	17½	3,500
Moss Rose Ext.	1	4	3,200
Evelyn	1	10	2,600
Percy	2	20	2,000
Grahamstown	1	10	1,650
			80,199,095

Outside Districts.

Company.	No. of Last Dividend.	Total Rate per Cent.	Total Amount of Distribution
Nigel	31	397½	780,899
Transvaal G.M. Est.	11	125	755,280
✓ Sheba	21	96¼	747,220
Glynn's Lydenburg	20	240	403,366
Transvaal G. Expl. and Land Co.	—	57½	191,969
Worcester Exploration	6	47½	45,467
Birthday (Klein Letaba)	4	15	22,150
United Ivy	6	47½	45,467
Barrett	3	14⅙	8,500
New Cleaver Estate	1	5	5,000
Total			2,972,201 ✓
Witwatersrand			80,199,095 ✓
			£83,171,296

Write for List 495.

TURBINE PUMPS

Pulsometer Engineering Co. Ltd

11, Tothill Street,
LONDON.

9 Elms Iron Works,
READING.

AGENTS FOR THE TRANSVAAL:
HARVEY & CO., LTD., Johannesburg.

Note.—The total rate per cent. shown in the foregoing tables is the sum of the rates at which the various dividends have been declared, and is not necessarily a total rate per cent. corresponding to the total sum distributed and the present issued capital.

The Robinson, as will be seen from the above statement, has abundantly earned the distinction of being the greatest gold mine in the world, the total dividends paid by the company to the end of 1911 being greater than the whole annual dividend from Transvaal Gold Mines in the same year, and nearly double the aggregate sum paid by the next on the list, the Crown Mines, in itself no mean member of a group each of which has paid well over a million sterling since the days its gold mining operations were begun.

Discoverer's Rights.

In the Pilgrims Rest district discoverer's rights have been applied for by Mr. F. W. Reed and Mr. A. J. Wagener for gold finds on the farms Dienge and Buffelsfontein, respectively.

TRANSVAAL COAL EXPORT TRADE.—I.

Prospects Reviewed—"Fair, with Encouraging Future Possibilities"—Extracts from Mr. Sandilands' Report on the Export of Coal via Delagoa Bay..

The important report made to the Railway Board some time ago, by Mr. Gordon Sandilands, Special Commissioner in the East, has the following, *inter alia*, now for the first time appearing in print:—"My investigations covered the following localities: (1) East Coast of Africa including Aden. (2) Bombay and the North Western Provinces of India. (3) Madras and Southern India. (4) Ceylon. (5) Mauritius and Reunion. (6) Madagascar.

(1) East Coast of Africa including Aden.

At present the East Coast Section offers but a poor market for coal owing to the entire absence of industrial centres, or important bunkering ports. Although probably 225,000 tons of coal are disposed of annually along the coast between Lourenco Marques and Port Sudan, the market is an illusory one. Casual sales of a few hundreds of tons may be effected during the year at Beira, Chinde and Zanzibar, but the major portion of the 225,000 tons is disposed of under European bunkering contracts at the coaling ports of Aden, Perim and Jibuti. The trade at these ports is in the hands of the steamship companies and of the large European coaling firms, and until these companies can be induced to accept the South African product in lieu of Welsh, little hope can be entertained of finding a large permanent outlet for Transvaal coal. The conversion of Welsh coal users into Transvaal coal consumers will be a difficult though not a wholly impossible task. The most potent factor against the introduction of Transvaal coal is the geographical situation of Aden and Perim; these bunkering depots are on the main trade route between Europe and the East, while the Transvaal lies in a back water so far as the great trade currents are concerned. European coal contractors are therefore favourably situated and able to take advantage of casual freights to replenish these depots at low rates. Other factors also militate against the South African product and make it unwise to count upon its early substitution for Welsh coal. They are: The vested interests which coaling contracts have in British coal fields. The relatively inferior quality of Transvaal as compared with Welsh coal; and the prejudice of ships' engineers in favour of the highest possible grade of coal. The fact that Indian coal has failed to make good its footing at Aden does not necessarily damn the prospects of Transvaal coal because the average quality of the latter (though probably from 10 per cent. to 15 per cent. inferior to best Welsh bunker coal) is yet superior to the average quality of coal exported from Calcutta. In order to establish Transvaal coal in the East Coast bunkering market a strenuous and persistent campaign of advertisement should be undertaken among the shipping companies and amongst coaling contractors. Such tactics could best be effected in London by an agent who is thoroughly conversant with Transvaal coal and also with shipping interests.

(2) Bombay and North Western Provinces of India.

Of the six sections which, for convenience sake, form sub-divisions of this report, that comprising the North Western districts of India and the Province of Bombay is by far the most important. The consumption of coal in this locality is an increasing one and may be assessed at: In the North Western Districts, 1,300,000 tons per annum; in the Province of Bombay, 1,500,000 tons per annum; total, 2,800,000 tons per annum. The actual volume of trade open to foreign (extra-Indo) competition falls far below this figure (2,800,000 tons) because a large proportion of the railway requirements have necessarily to be supplied to the inland termini of the three great railway systems. The North Western State Railway, the Bombay Baroda and Central Indian Railway and the Grand Indian Peninsula Railway procure probably forty per cent. of their annual requirements by rail from the Bengal fields. Thus only the "sea-borne" coal requirements of this section are open to foreign competition. The ratio of "sea-borne" to "rail-borne" varies slightly according to the prices of "sea-borne" coal at the ports, which again are dependent upon ruling freight rates. I estimate the annual "sea-borne" tonnage as follows:—At Karachi between 600,000 and 700,000 tons; at Bombay about 1,300,000 tons. It follows naturally that a market of this magnitude should be the arena for the world's coal producers. Indian, British, Australian, Natal and even Japanese coal masters watch it closely and rarely fail to benefit by any incident which may favour the sale of their special product. The Indian coal fields easily hold the market against all comers, notwithstanding the fact that of recent years the demand for coal in Western India has kept ahead of the supply from Indian sources. In this the Indian fields are enormously assisted by the low rates at which coal is carried upon Indian Railways. The home freight charged to Indian Railways is ·09 pies per maund per mile, equivalent to ·2d. per ton per mile. My enquiries have led me to the conclusion that in general the average quality of Indian coal even from Bengal is lower than that of Australia or Natal. A strong demand for a higher grade coal undoubtedly exists, especially among the bulk consumers, such as the railway companies and large millowners. Only a limited number of practical tests of Transvaal coal have been made in India, and though of an encouraging nature, the relative commercial values of Bengal and Transvaal coal are as yet undetermined. Sample cargoes are, however, now *en route* to three Indian railway systems, and it is to be hoped that the superiority of Transvaal coal may be clearly established. When considering what prospects a new and unknown coal may have upon entering the Indian market, the obvious question arises, viz.:—Why have Australian and Natal coals only secured a moderate footing therein, although their superiority is generally admitted? I believe that the correct answer lies within the fact that Indian consumers are over cautious about placing large contracts with distant foreign collieries; they constantly have had bad experiences in connection with maintenance of grade and regularity of delivery even with their own collieries, and therefore they fear to take on greater risks. I am further of opinion that their objections could be overcome if satisfactory guarantees were forthcoming, i.e., such as could only be given by the united collieries of the Transvaal, or indeed of any State where organisation and unity of action existed among coal masters. The bare facts that during 1907-8, when prices were unusually high, 235,000 tons of foreign coal were successfully placed on the Bombay market, and that during the present year Natal has sold at least 90,000 tons, and Australia 30,000 tons, should be sufficient evidence that an opening for foreign coal exists. During my advocacy of Transvaal coal I was continually asked for guarantees of uniform quality over an extended period. Owing to the present organisation of the Transvaal export trade, and to the more or less even quality of the seam in the Witbank district, I was fortunately able to give satisfactory assurances, but I should have secured a very poor hearing had I been unable to do so. The practical problem before Transvaal colliery owners is: How to place a moderate quality coal upon a market which is now held by an inferior indigenous product? The situation of the Transvaal is somewhat analogous to that of the German coalfields. The latter, although labouring under the handicap of a relatively low grade coal, have been able by means of a central organisation (i.e., the Westphalien Coal Syndicate) to claim recognition for the German product in the world's market. The former can only hope to secure a permanent share of the

Indian market by establishing a recognised standard quality for the Transvaal coal, and by attacking the market systematically through a central organisation.

(3) MADRAS AND SOUTHERN INDIA.

The situation of the Hyderabad coal fields and the proximity of Calcutta to the Port of Madras places Indian coal almost beyond foreign competition in the Madras Presidency. Compared with the Province of Bombay, Madras may be called a purely agricultural province, for although cotton mills, oil presses and minor industries do exist, yet the industrial development of Madras is in a backward condition. Statistics giving the total consumption within the Province (including the native states of Hyderabad and Mysore) are unfortunately not available. The relative tonnages of "foreign" and "Indian" sea-borne imports will, however, indicate the value of this section of the Indian market to the Transvaal. Although the major portion of the Province's requirements come from the Singareni fields in Hyderabad and from Bengal the imports have been:—1905/6: Foreign imports, 1,429 tons; Indian imports, 164,000 tons; total, 165,429 tons. 1906/7: Foreign imports, 12,270 tons; Indian imports, 238,000 tons; total, 250,770 tons. 1907/8: Foreign imports, 35,084 tons; Indian imports, 343,000 tons; total, 378,084 tons. Prior to 1905/6 an average of only 5,000 tons of foreign coal was imported annually, but owing to short deliveries of Indian rail-borne coal the foreign imports increased substantially. The two railway administrations are the only bulk consumers and they burn about 400,000 tons annually and draw their supplies for the most part from the Singareni fields. Excluding the railways and also the towns of Madras, 50,000 tons per annum estimated consumption; Pondicherry, 20,000 tons per annum estimated consumption; Titicorin, 22,000 tons per annum estimated consumption; the other Madras coal orders are too small to admit of direct shipping. Such native ports as Calicut, Quilon and Allspay take about 1,000 tons per annum, but for such small orders the Transvaal could not economically compete with small coasting tramps from Calcutta. The best chance of selling Transvaal coal in Madras is by securing a railway contract and by supplying via the port of Marmagoa, though possibly a few thousand tons might be sold through the instrumentality of an energetic local agent in Madras City.

(To be continued.)

Rand Native Recruiting Corporation.

The following circular has been sent to native labour recruiters from the Johannesburg mining companies:—"It has been the intention of the groups for some time past to establish a central organisation for the recruitment of natives for employment on the mines of the Rand and remove the undue competition existing in procuring native labourers. An understanding has been come to between the Anglo-French group, Central Mining-Rand Mines group (Eckstein group), Consolidated Goldfields group, Consolidated Investment group (Barnato group), Consolidated Mines Selection group, East Rand Proprietary Mines group, General Mining and Finance group, Goerz group, and Neumann group, to give effect to this intention at an early date, and we now wish formally to notify recruiters thereof that the new organisation, which will probably come into force on October 1 next, will have no connection with the Witwatersrand Native Labour Association, and will be named the Native Recruiting Corporation, Limited. All existing agreements as between the separate groups and recruiters will be duly respected, though their control and management will be vested in the new organisation. It is not the intention of the proposed organisation to do away with the present method of recruiting natives through the traders and recruiters. Natives will, as at present, engage themselves to the mines of their own choice, and no arbitrary distribution of natives will take place. On the completion of arrangements you will be furnished with further particulars."

"T.C.L." Activity.

The T.C.L., according to the Barberton paper, have acquired a large piece of ground in Hyslop's Creek, and it is their intention to exploit it as soon as transfer is completed.

New Heriot G.M. Co.

The report for the quarter ended June 30th of operations at the New Heriot states that on development there were 954 feet of driving, sinking, etc. The ore crushed during the period was 36,180 tons, from which 15,634·86 ozs. were obtained, which, together with 743·992 ozs. from treatment of accumulated sands and slimes, brought in a total revenue of £68,872. Working expenses absorbed £42,173, or 23s. 3·753d. per ton, which left a profit for the quarter of £26,670, or 14s. 9·112d. per ton. The expenditure on capital account was £414.

THE HEALTH CAMPAIGN ON RAND MINES.

Preventive Measures—War on Flies—What Some Mines Have Been Doing to Fight the Evil—Facts from Official Circulars.

It is satisfactory to know that our article of last week calling attention to the need for increased attention to preventive hygiene on the Rand has provoked attention throughout the industry. One result promises to be a revival of the war against flies that had an abortive beginning nearly two years ago. Plainly the unsympathetic attitude of the mine doctors had much to do with the failure of the movement then. It may be of interest and value to repeat here some points from a circular on the subject issued by the Rand Mines, Ltd., in December, 1910:

FLY-BORNE DISEASE.

(1) Notwithstanding the considerable expenditure that has been incurred on the mines of the Rand (in the course of the past four or five years) to improve the conditions of coloured labourers, particularly as regards housing and feeding, there had been no reduction in the mortality rate and in the percentage of boys not working owing to sickness. (2) The researches of the London and Liverpool Schools of Tropical Medicine, and of other investigators, show that certain germ diseases may be carried and spread by flies and other insects, and particularly by the common house fly. (3) Dr. Bergey, Professor of Bacteriology of the University of Pennsylvania, in a book on the "Principles of Hygiene," recently published, states: "Insects may convey pathogenic bacteria on their bodies by coming in contact with infective materials, as tubercular sputum, typhoid, dysentery, or cholera stools. Bacteria may be conveyed considerable distances and then deposited on food materials, and thus form a new focus of infection. The insect which is probably the most frequently the disseminating agent of such diseases is the common house-fly—musca domestica." Professor Bergey mentions an epidemic of typhoid fever in Chicago during the summer of 1902, and quotes evidence which leads to the conclusion that this epidemic was brought about by the dissemination of the infectious material by flies. He adds: "Flies may carry bacilli within their bodies when they are permitted to feed on tubercular sputum. Consequently, the faeces of flies may be a source of danger. Flies may also serve to carry in a similar manner the micro-organisms of a number of other infectious diseases, as diphtheria, pneumonia, erysipelas, suppuration, and possibly of small-pox, though we have as yet no positive proof of the conveyance of small-pox in this manner. Dr. Ficker has found that flies fed on typhoid cultures give off the bacilli twenty-three days after infection. Typhoid bacilli were found in the intestine nine days after feeding on typhoid materials." An inspection of the mortality returns of the mines shows that the germ diseases which, according to Professor Bergey, are liable to be spread by flies, are among those from which natives mainly suffer, and it is probable that if active and regular steps are taken to exterminate flies, a diminution of disease will result, and the general health of the property and compounds be improved. The directors, therefore, consider the restriction and suppression of flies to be a matter of great importance, warranting the closest supervision by your Medical Officer and a systematic pursuit of some such steps as those set forth in the enclosed memorandum. It is desired that immediate steps be taken to give effect to these recommendations, and that you delegate the work of regularly inspecting the property to one of your officials, whose report thereon shall be presented to you monthly for discussion with your Medical Officer. The inspection should comprise all parts of the property, whether inhabited by man or beast. My directors further desire to have a report from your Medical Officer dealing with:—(1) The health of the native employees (and of the white employees as far as obtainable) during the past year (1910) compared with the position in previous years, indicating what diseases have shown a tendency to diminish as the result of the very considerable expenditure incurred in recent years in improving the living conditions of the mines, and also what diseases are on the increase and the probable causes of this increase. (2) Any evidence there may be in their possession as to the spread of diseases through flies, fleas, bugs, ants and other insects, and what has been done to exterminate such pests. (3) The further steps that should be taken in order to improve the health of mine employees.

The memorandum attached on the prevention and destruction of flies was as follows:

Common house flies are well known to be carriers of disease germs. War upon flies cannot be successfully waged with fly paper, fly traps, or even wire netting. It is by getting rid of their breeding places that flies can be conquered. Flies breed in damp dirt, preferably in horse manure. They will also breed in cow dung, human excreta, fermenting food stuffs, dead carcases, decaying vegetables, rotting straw, paper, rags, sacks, old mattresses and the thousand-and-one decayable objects and bits of garbage that should be carried off in the sanitary cart or burned. It is a wise plan to burn all rubbish that can be burned, particularly paper and rags. The fly takes about ten days to reach maturity from the egg, and consequently, if precautions are taken to remove all manure once, or preferably, twice a week, much of the nuisance would be prevented. Stables, cow-sheds and pig-sties on the Company's property or in the neighbourhood should be examined, and the owners called upon to remove manure heaps, etc., at least once a week. If they decline to do this, the matter should be reported to Medical Officer of Health of the Municipality, and, if necessary, prosecutions instituted. "The fly," says one writer, "has one supreme motive in life: that is to move towards the strongest smell. He enters the house because there are more smells inside than out, and once in, he frequents the kitchen because there are more smells than in the parlour. The fly does not find its food by sight, but by odour only. He goes in where the out-draught carrying the kitchen smell, comes out. If the window is open at the top and bottom, and the fresh air goes in at the bottom and the air smelling of food comes out at the top, flies will enter through the top only. The moral is to adjust the ventilation so that the out-draught shall be through screened windows. For the same reason, all unused chimneys connected with fireplaces ought to be screened off if the chimney draught is outward. "The fly never hunts for an opening to come in by. He goes head up stream to an air current which bears the savour of human food. Therefore, when the air of a house goes out by the chimney the flies come in." There will be fewer flies in compound kitchens if wire netting is placed on the windows and openings in the upper portions of the building through which most of the smells go out. If fly papers are used to destroy flies already in a room they should be baited—it quadruples their utility. Any strong-smelling food will answer, such as cheese and meat which need not be strictly fresh. The bait must be for the fly the most prominent odour in the room. Two tea-spoons full of formalin, with a little milk and sugar, in a soup plate placed in a room—out of the reach of animals and children—will soon rid it of flies, provided no other water or liquid of any sort is exposed in the room. The fly is sensitive to light, but not to the same extent as the moth. "One can usually, after a little experience, no matter what the weather, clear a room of flies by the obvious device of opening a window and letting them fly out. The light in the room must be made dim, but not so dim as to remove the stimulus to movement. There should be a single bright opening so that all the light shall come from one region. That single opening should usually be where there is shade outside, that the light there may not be too bright." If these conditions are fulfilled, the flies will go out. Or, if one fears to leave the window unscreened in fly time, it is a good plan to adjust the light to bring the flies towards the window and equip the bright part of the room with fly paper or a plate with formalin. This device is often most effective. "Atkinson's fly escape" arrangement is a device to induce flies to go out of a room at daybreak and is claimed to be a great success. It can be applied in two ways:—(1) The lowest row of pane spaces in the window must have two panes about one inch apart, each covering only three-quarters of the pane space and over-lapping in the centre only. The outside pane is attached to the frame at the bottom and the sides, and not at the top. The inside pane is attached to the top and sides and is open at the bottom, so that flies in the room can alight on the bottom portion of the outside pane and get out of doors by simply walking upward. (2) The lower half of the window must have the pane or panes set flush with the sash on the side towards the room. Thus the lower part of the window, sash and glass together, is a single unbroken surface on which a fly can crawl unobstructed. The usual position of the sashes, moreover, is reversed, so that the upper sash drops down inside the lower. The upper sash must be dropped to within six or eight inches of the bottom. The trap is set overnight by drawing the curtain to the lower edge of the inner pane or panes in the first case and to the lower edge of the upper sash in the second instance. In the dim light of early morning, the flies

ROBESON-DAVIDSON PATENT CENTRIFUGAL PUMPS

For Pumping Sands and Slimes.

Minimum Maintenance Costs, Highest Efficiency, Unrivalled Accessibility to all parts and Flexibility in raising tailings to any height.

The Pump that Supplanted the Tailings Wheel.

Further particulars from the Licensees:—
FRASER & CHALMERS, LTD., Johannesburg.
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in the room will make for the light portion of the window below the bottom of the curtain. Flies usually come to a rest on a vertical surface, head up. When they crawl, therefore, they crawl upwards between the two sashes or two panes, and out of doors.

Instructions for the Prevention of Flies.

(Taken mainly from recommendations made by Professor Newstead, of the Liverpool School of Tropical Medicine.)

1. Stable manure, either on the property or in the neighbourhood, should not be allowed to accumulate for more than five days. 2. All refuse from quarters and houses should be emptied and the receptacles carefully swept out and disinfected at intervals of not more than five days. The partial emptying of receptacles should, in all cases, be discontinued. 3. Ashes from households should not be allowed to accumulate for more than seven days. 4. In the case of married quarters, the most strenuous efforts should be made to prevent children defaecating in the open. Parents should be compelled to remove such matter immediately. The danger lies in the overwhelming attraction which such faecal matter has for house flies, which may thereafter come into direct contact with human being or foodstuffs. They may, as one authority puts it, "in a very few minutes load themselves with dejections from a typhoid or dysenteric patient not as yet sick enough to be in hospital or under observation, and carry poison so taken into the very midst of the food and water ready for use at the next meal. There is no long roundabout process involved." 5. The seats of all privies attached to quarters and elsewhere should be fitted with hinged wooden lids. The occupants of married quarters should be instructed to see that a small box or tin of sifted ashes and a sugar scoop or other suitable instrument are provided in privies, and that ashes are systematically scattered over excreta. 6. Ash-pit refuse, which in any way tends to fermentation, such as bedding-straw, old rags, paper, waste vegetables, dirty bedding from the hutches of pet animals, should be disposed of as soon as possible. 7. Special precautions should be taken at the hospitals to ensure, by means of wire-screens, the protection from flies of all foodstuffs. Also by similar means to prevent flies in the sick wards, and that the faeces of patients should be disposed of in such a manner as to obviate the possibility of flies obtaining access.

MINE NATIVES AND TUBERCULOSIS.

The Danger to the Mines—A Case for Research—Another Expert's Views.

In the course of a lecture on "Primitive Tribes and Tuberculosis," by Major S. L. Cummins, R.A.M.C., which was delivered recently before the Society of Tropical Medicine and Hygiene, the author, after referring to the conditions in Egypt and the Soudan, continues: "McVicar, writing on tuberculosis in South Africa, calls attention to the high incidence of the disease among coloured people when in contact with Europeans, and mentions that 'in the interior, especially in the Transvaal and on the Upper Zambesi, tuberculosis is almost unknown.' At the same time, the tubercle death-rate amongst whites compares favourably with that in European countries, being 1·4 per 1,000 in 35 towns of the Cape, 1 per 1,000 in Natal, 1·37 per 1,000 in Orange Free State, as compared with 1·62 per 1,000 in England and Wales during 1902. The average death-rate of coloured people in six towns of the Western Province of the Cape was over 8·6 per 1,000. So that here is an exact analogy to the Soudanese paradox. The European, coming to South Africa from a country where tuberculosis is common, has a low incidence from that disease, while the native, coming from the interior where tuberculosis is rare or absent, displays, when he mingles with the European, an intense liability to tuberculosis." Major Cummins goes at length into the proofs which exist that the bulk of Europeans who reach adult life have been subject to tuberculosis, but have overcome the attack. "There is reason to believe," he says, "that while the healthy adult who has grown up in civilised surroundings has, in 90 or more per cent. of cases, a demonstrable but isolated and harmless tubercular focus somewhere in his body, the African, under the natural conditions of his own country, is demonstrably free from such foci in 80 or 90 per cent. of cases." The test, of course, is that of tuberculin reaction. Here are the conclusions to which Major Cummins believes we are driven:

(1) That primitive tribes are highly susceptible to tuberculosis, because, in the absence of the tubercle bacillus, they have never been obliged to protect themselves against that organism.

(2) That civilised peoples are highly protected against tuberculosis because they have, in contact with the tubercle bacillus, elaborated protective substances against that organism.

"The first proposition lays upon us a duty and the second opens to us the hope of fulfilling it with success. . . . If it is true that the African, for instance, is specially liable to tuberculosis, then it will spread rapidly in the Soudan, in Uganda, in East Africa, when once it is introduced. Our efforts should be directed to keeping it out, by strictly forbidding the country to invalids seeking a climate suitable for early tuberculosis, by invaliding every official who contracts or develops tubercular disease, and above all by detecting and isolating early cases among the natives. . . . There is much to be done in the direction of protecting susceptible races from contact with the bacillus; but it must be admitted that the task will be more and more difficult as civilisation overflows its confines on the one hand, and as native populations increase under the conditions of peace and material prosperity that our administration brings to them on the other. . . . Above all, research is needed in the direction of artificial protection of susceptible people by means of inoculation. Work is being done in this direction already and promising results have been attained. The attempt to immunise susceptible persons coming from primitive tribes to our armies or to our mines might lead to results of far wider importance than any question of purely tropical medicine."

Goedmans Drift Proclaimed.

Proclamation is announced of portion of the farm R23, known as Goedmans Drift, as an alluvial diamond digging, Divison of Herbert. Notice is given that the inspector of claims will attend at the farm R23, in the Division of Herbert, at 10 a.m. on August 6th, for the purpose of reading the proclamation declaring portion of the farm an alluvial diamond digging, when it shall be lawful for any person of full age (the holder of a miner's certificate) to peg off one claim in the said digging, after the discoverer and owner have pegged off the claims to which they are by law entitled.

High Mining Salaries

EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings; Box 2061.

THE USE OF DYNAMITE IN FARMING.

Breaking the Hardpan—American Methods—Instructive Paper by Mr. W. Cullen.

THE following is the text (slightly abbreviated) of a paper on "Farming by Dynamite," read by Mr. W. Cullen, at the recent Congress of the South African Association for the Advancement of Science, at Port Elizabeth:

This question has recently aroused a great deal of interest in South Africa, and the newspapers have recorded quite a number of interesting demonstrations which have been given by the different manufacturers of explosives. The idea is not new by any means, and has been practised for quite a number of years in England and to a lesser extent on the Continent, but it is in the United States of America that the greatest development has taken place. Indeed, one might safely say that the idea is almost exclusively American, so general has become the use of dynamite in farming operations there. Some six or seven years ago the writer, who had been watching events on the other side, tried to interest the Transvaal Agricultural Department in the question, but receiving no encouragement he let the matter drop. The very general interest now being taken is evidence of the fact that South African Agriculture is endeavouring to keep pace with the times, and, although no one can dogmatise at this stage, some one or two fairly definite conclusions have already been reached. These will be referred to presently. When the Union Legislators were in the Transvaal towards the end of last year, Sir Meiring Beck, in responding to a toast at one of the official functions, stated that there was more potential wealth in the first 12 inches of South African soil than in all the mines, and he was right. "Farming by Dynamite," as it has now come to be called, enables one, however, to go down much lower than 12 inches. But what is the use of this? one may ask. Well, the answer is very simple. Most arable lands ultimately develop what is called a hardpan. The plough, as a rule, does not get down further than 10 inches—seldom so much. True, by deep ploughing it is possible to get down 15-16 inches, but after all this is only comparatively deep and even then the so-called hardpan is ultimately formed. In most cases this becomes waterproof, and prevents rain soaking into the ground. As a consequence it also prevents roots getting down, therefore, the area from which they draw their nourishment becomes limited. If anyone cares to take the trouble to drive a crowbar, or jumper, as it is called out here, by means of a hammer into land which has been ploughed for a succession of years, it will be found that the first 9-12 inches is easily traversed, but as soon as this small distance is passed, the jumper goes down with ever-increasing difficulty, showing that a new stratum has been struck. This is called hardpan, an American term, if I am not mistaken, and it is quite easy to understand how it is formed. Once this hardpan is opened up by dynamite or any other means, the rain soaks in and an immense reservoir of stored-up water is formed, and the roots seek their way downwards instead of extending laterally. The soil also becomes aerated, which is a very necessary condition for healthy plant growth.

TONING UP THE SOIL.

Now we have no South African experience to go on yet, and it will be many years before we have, but our American friends, from whom I am in the main quoting, speak of the beneficial effect of breaking up the hardpan with the greatest assurance. They have applied it to practically all kinds of agricultural and horticultural products, such as maize, cotton, fruit and tobacco, and although the initial operations may be, and no doubt are, expensive, they are positive that the results repay the expenditure many fold. I could quote numberless cases which bear this out, but the actual proof is found in the fact that dynamite for this particular branch of work forms a very large proportion of the output of many American explosive factories. The truth is that dynamite would not be used in such large quantities unless it gave a good return; our American cousins are cute enough for that. Perhaps one of the most interesting developments in connection with its use is the "toning up" of ground on which fruit trees or cotton plants have been growing. It happens sometimes that year by year the yield of fruit or cotton has fallen off and the plants seem limp and lifeless. Something very similar to hardpan is generally found to be the cause. Charges of dynamite placed at judicious intervals between the rows, have loosened the soil below and given the plants a new lease of life. If care is taken in placing the holes, the roots need not be damaged at all, indeed, if the charge is placed properly, all that happens when the explosion takes place is that a dull thud is heard and the soil is seen to rise a few inches, only to subside immediately. If one opens it up, however, the effect about 3 to 4 inches down is very considerable. The soil all round is loosened and fissured, but the effect really extends much further than mere digging indicates, as I have already said, results prove this.

Our American friends use the term "ploughing by dynamite" very frequently, but this is really a misnomer, because in every case ploughing and harrowing have to follow on the breaking-up. Supposing it is desired to break up either old land with hardpan or virgin veld, holes are made in the ground about 3 feet to 3 feet 6 inches deep and at 12 inches apart. When the charge explodes very little disturbance of the surface takes place, but as in the "toning up" process, which I have described, the effect below is very great indeed. No person can yet dogmatise as to the depth of holes or their distance from one another, nor yet as to the charge of dynamite which should be used. Experience is the sole guide, and every case must be considered on its merits. For a light loamy soil, however, anything from 50-100 lbs. of explosives, per acre, will be required. For the hard slac of the Cape lucerne lands much more would be necessary, but I am only speaking from hearsay. In any case lucerne land, which is worth, as I learn it is, from £200 to £400 per acre, could easily stand from £5 to £10 spent on dynamite if it can be proved, as I believe it can, that a commensurate increase in cropping will result. With regard to staple crops, however, we must await definite results, and already there are a great many experiments in hand, even with mealies, the results of which will be duly recorded. Of course, if "dynamiting" had to be done every year, few crops could stand it, but American experience shows that once every five or six years is quite sufficient, and from what I have seen I can well believe this is the case.

REMOVING TREE STUMPS.

There are two applications of dynamite to farming and afforestation about which I can speak with a very considerable amount of assurance. The first is the removal of tree stumps, and the second is the planting of trees. The removal of stumps is always a troublesome and expensive process, and when the tree has been a deep-rooted one, it is intensified. In many cases rather than go to the expense of removing them, the farmers simply leave them in the ground. Dynamite will get out a stump at a fraction of the ordinary cost, and if it be not too large, not more, say, than 18 inches diameter, one charge will be sufficient. If the stump is a very large one, two or more charges, placed at different points, may be necessary, and when this is so, it is best to do the blasting by electricity, as by that means both charges, and indeed any number up to 50, can easily be set off simultaneously, which gives the best effects. With experience it is possible to blast even the largest stumps with a single charge, but here again one cannot dogmatise, and if a lot of stumps have to be removed it will always be found cheapest in the long run to get advice from an expert.

The second application of dynamite about which one can speak with a measure of assurance is the planting of trees. There is no doubt whatever that one of the most crying needs of this country is afforestation—more crying, perhaps, than that of the raising of crops. I need not here speak of the climatic influences of afforestation, as they are now generally recognised. Dynamite will certainly further afforestation by cheapening the planting. In the same way it will cheapen the making of orchards, for no matter how difficult the soil, dynamite will make a hole big enough for a good-sized fruit tree at very little cost. But even though it does cost as much to make the hole by dynamite as by the ordinary process of digging and trenching, the ultimate result is not so good by the latter as by the former, for, as already explained, dynamite opens and cracks the ground underneath to a very considerable depth. By this means plant growth and yields are increased—so our American friends say, and one can well understand that this is so. Limiting ourselves, however, for the moment to the economies of making holes for trees, we have already sufficient South African experience to indicate that "dynamiting" is cheaper than the ordinary process. There are many other possible applications of dynamite to farming, which will all come in time. For instance, in the Transvaal, I have seen some most excellent ditches made on farms in vlei and other land. Then again, draining land by the ordinary perforated pipes is a very costly process, so costly indeed, that it is seldom done in South Africa. Breaking through the practically waterproof stratum with dynamite is just as effective and much cheaper. Here, again, however, we shall have to wait results before any general scheme can be outlined. This is not the place to describe how the various simple operations of preparing the cartridge, making the holes and charging them are carried out. They are simple, however. Some may be curious as to the kind of dynamite which is used for these operations, but there is really no great secret about it. It is what is called a "slow explosive," i.e., slow in exerting its explosive effects. The quicker and stronger explosives such as blasting gelatine, and the old Kieselguhr dynamite, which was formerly used in the Kimberley mines, would be quite useless for the processes which have been described. In most cases they would only make a little crevice at the bottom of the bore hole and would certainly not give the heaving and rending effects which are necessary. They, too, however, have their application in the removal of boulders and the making of roads and cuttings, but these operations are just a little outside the scope of these notes—which have been written with the sole object of arousing interest.

In last week's edition of the "Union Gazette," the farm Lisbon No. 9, situated in the district of Lydenburg, mining district of Pilgrim's Rest, is declared a public digging for precious metals as from August 23, 1912. The farm Berlyn No. 458, in the same district, is also declared a public digging as from the same date.

HENDRYX AGITATOR; RESULTS OF M.T.C. TESTS.

Dr. Hendryx's Claims Established—Saving in Time Effected—Official Figures.

(For table, see following page.)

As promised, we print to-day a list of tests made by the Mines Trials Committee of the Hendryx Agitator, also a description of the Agitator, and an account written by one who has been able to compare air agitation with the Hendryx mechanical agitation, showing satisfactory results in favour of the latter. At the Fairview (T.C.L.) plant, two Hendryx Combination Agitators and Filters are being installed for the purpose of agitating the mixed product (sands and slimes), and subsequently taking off the solution by gravity filtration in the Agitator, this forming an ideal and cheap plant for small properties.

Description of Agitator.

The Hendryx Agitator possesses many important features which have not before been incorporated in the treatment of ores. At the same time, the complete machine is the result of many years of careful investigation, and the agitator as now presented possesses improvements suggested in actual operation on a commercial scale. The agitator consists of a cylindrical tank having a conical bottom. In the centre of the tank is a circular well which extends nearly from the top to the bottom, and is rigidly supported by bracing from the side of the tank. A circular apron is fitted to the top which slopes gradually toward the circumference and permits the pulp in flowing over it to be spread out into a thin sheet, and absorb an abundance of free oxygen from the air. The apron also serves to distribute the pulp towards the periphery, in an even flow, without generating undue foaming. In the well is a shaft carrying a driving pulley near the top and a number of screw propellers or lifting wings. The discharge valve is opened or closed by a hand wheel connected to a screw. A coil of pipe serves to regulate the temperature of the charge by means of steam or hot water passing through it. The revolutions of the propeller in the well produce a strong upward current, resulting in a rapid and uniform circulation of the pulp upward to the aerating and distributing apron, where it spreads out into a thin sheet, with maximum surface exposure, for aerating and saturating the charge with oxygen. The Hendryx Agitator has simplified the treatment of ores from the fact that both sand and slimes can be treated together, thus obviating the necessity of installing a plant for the percolation of the sands and a separate one for the slimes. An important advantage of the Hendryx Agitator is in the short time of treatment. Tests on various ores show that, at any given mesh, as much or more of the gold and silver can be dissolved in one hour by the use of the Hendryx Agitator as can be dissolved in twenty-four hours by the usual methods of percolation; completing the dissolving of the soluble metals two to five times quicker than either air or centrifugal pump agitators. This necessarily decreases the cost of installation due to the decreased amount of ore storage required. In the treatment of ores containing sulphides it is found in percolation that part of the consumption of cyanide is proportionate to the time of treatment, due to the partial decomposition of the sulphides. Ore subjected to several days' leaching often decomposes to such an extent that the gold and silver is precipitated back into the charge, while the consumption of chemicals makes a profit prohibitory. With a short time of treatment, usually six hours for gold ores and twelve for silver ores and weak solutions, combined with rapid and thorough agitation, aeration and heat, the consumption of the chemicals is reduced to a minimum, while the extraction is brought up to the highest possible point. In the 24 ft. 6 in. machine a charge of 100 tons of ore and 200 tons solution are turned over with a thirty inch pump every six minutes. In other words, 7,500 cubic feet of ore and solution are pumped to an elevation of eighteen inches every six minutes and spread over the distributing and aerating apron. 8 ft. 6 ins., dry ore; 13 ft., 16, dry ore; 18 ft., 35 tons, dry ore; 24 ft. 6 in., 100 tons, dry ore. Special attention is called to the small height of the Hendryx Agitator and the constructional economies resulting therefrom. The power required to operate a machine holding a charge of 300 tons of ore and solution containing two of solution to one of ore is fourteen horse-power. The reason for the small consumption of horse-power is due to the fact that there is only an eighteen inch lift. The pump casing is filled to the same level as the charge in the tank by hydrostatic pressure. The simple compact construction, and the fact that none of the bearings are exposed to the moving pulp, make the cost of repairs exceedingly light. The Hendryx Agitator is built in four sizes—8 ft., 13 ft., 18 ft., 24 ft. 6 in. Acid proof agitators are also built, either open or enclosed. Two sizes for laboratory use are kept in stock. They are 18 inch, with capacity of 25 pounds of dry ore, 32 inch with a capacity of (250 lbs.) tons of dry ore. The Superintendent of the Lake Superior and Nevada Development Company writes as follows:—

> Your inquiry regarding our Hendryx Agitator has been received and we are pleased to advise as follows:—Charge of dry slime, 40 to 45 tons; solution, 100 to 90 tons; time of agitation, 10 hours; charging and discharging, 2 hours; screen analysis of slime, 4 per cent. on 100 mesh, 6 per cent. on 120 mesh, 5 per cent. on 150 mesh, 12 per cent. on 200 mesh, 73 per cent. through 200 mesh; h.p. required to run agitator when level of pulp is within 18 in. of top of tank, 8 h.p. We use a 10 h.p. motor to operate the agitator, and when the level of the solution gets down to 24 in. below the top of the tank the motor gets hot and we have to stop agitating. At 36 in. below the fuses burn out (50 ampere) as fast as we can put them in. We have agitated a 3½ to 1, and a 3 to 1 pulp also, but the results, as far as power is concerned, seem to be the same. We have allowed the pulp to settle in the agitator for 21 hours, but have no difficulty whatever in starting it up when the pulp level is within 18 in. of the top of the tank. The solution in the agitator is kept at a temperature of about 100 deg. Fahrenheit by means of the heating coils. Our gold-silver values (gold predominates) are carried in iron pyrites, and our tests gave us 92 per cent. extraction, 0.6 lbs. KCN consumption with 16 hours' agitation when the ore was ground in a small Abbe tube mill, so that 85 per cent. would pass 200 mesh. The agitation was accomplished in a Hendryx laboratory size (17 in.) agitator. The tests made with air agitation gave us 83 per cent. extraction with a 2 lbs. consumption of KCN, agitating 24 hours, 85 per cent. of the slime passing 200 mesh. In actual practice we find that we are getting 96 per cent. extraction with 0.4 lbs. KCN consumption, and agitating 10 hours, the slime screen analysis being given above. We add 6 lbs. of lime per ton of ore. The reason we get such good results in the mill is partially due to the fact that the heavier iron pyrites are ground finer in the tube mill than the gangue materials, as a selective action takes place which was not noticed in the small laboratory tube mill. We add our weak cyanide in the Chilian mill, and all subsequent grinding is performed in cyanide solution.

E. J. MOYNIHAN,

CONSULTING ENGINEER.

PLANS, SPECIFICATIONS, REPORTS AND ADVICE, MINING EQUIPMENT, STRUCTURAL WORK AND FINANCIAL ADVICE.

10, ANGLO-AUSTRIAN BUILDINGS. Box 2061.

The Following Table gives Results of Actual Tests made by the Mines Trials Committee at the Wolhuter G.M. Co.:—

Test No. and Date.	1.—March 11, 1912.	2.—March 20, 1912.	3.—March 26, 1912.	4.—April 9, 1912.	5.—May 2, 1912.
Product..	Sands and Slimes.	Slimes only.	Sands and Slimes.	Sands and Slimes.	Sands and Slimes.
Quantity and Ratio ..	Ore: 35 tons Soln.: 70 ,, } 1 : 2	Ore: 35·03 tons Soln.: 70·00 ,, } 1 : 2	Ore: 35 tons. Soln.: 71 ,, } 1 : 2	Ore: 35 tons. Soln.: 72·4 ,, } 1 : 2·068	Ore: 35·09 tons Soln.: 73·69 ,, } 1 : 2·1
Grading: + 60	9·4%	—	13·75%	5·93%	9·18%
+ 90	19 3%	·1%	17·74%	20 52%	21·10%
+ 120	11·3%	·4%	10·70%	12· 0%	11·39%
— 120	60·0%	99·5%	57·81%	61·45%	57·33%
Average Assay of Charge ..	2·55 dwts.	1·65 dwts.	2·2 dwts.	1·95 dwts.	2·3 dwts.
Solution Sth per ton of ore— Start	·068 × 2 = ·136	·021 × 2 = ·042	·063 × 2 = ·126	·052 × 2 = ·104	·0525 × 2 = ·105
Finish	·066 × 2 = ·132	020 × 2 = ·040	·060 × 2 = ·120	·050 × 2 = ·100	·050 × 2 = ·100
Loss	·002 × 2 = ·004	·001 × 2 = ·002	·003 × 2 = ·006	·002 × 2 = ·004	·0025 × 2 = ·005
Extraction:—By Solution.	Assay × Ratio. dwts.	dwts.	dwts.	dwts.	dwts.
1 hr.	·76 × 2 = 1·52	¼ hr. ·5 × 2 = 1·0	1 hr. ·67 × 2 = 1·34	1 hr. ·6 × 2·068 = 1·24	·57 × 2·1 = 1·218
2 hrs.	1·00 × 2 = 2·00	½ hr. ·58 × 2 = 1·16	2 hrs. ·83 × 2 = 1·66	2 hrs. ·67 × 2·068 = 1·385	·65 × 2·1 = 1·365
3 hrs.	1·10 × 2 = 2·20	1 hr. ·69 × 2 = 1·38	3 hrs. ·84 × 2 = 1·68	3 hrs. ·68 × 2·068 = 1·406	·79 × 2·1 = 1·659
4 hrs.	1·15 × 2 = 2·30	2 hrs. ·76 × 2 = 1·52	4 hrs. ·9 × 2 = 1·80	4 hrs. ·79 × 2·068 = 1·633	·85 × 2·1 = 1·785
5 hrs.	1·15 × 2 = 2·30	3 hrs. ·76 × 2 = 1·52	5 hrs. ·92 × 2 = 1·84	5 hrs. ·84 × 2·068 = 1·737	·89 × 2·1 = 1·869
6 hrs.	1·20 × 2 = 2·40		6 hrs. ·94 × 2 = 1·88	6 hrs. ·84 × 2·068 = 1·737	·98 × 2·1 = 2·058
7 hrs.	1·20 × 2 = 2·40				
% Extraction by KCy. Solution.	2·4 dwts. from 2·55 = 94·1%	1·52 dwts. from 1·65 = 92%	1·88 dwts. from 2·2 = 85·4%	1·737 dwts. from 1·95 = 89·3%	2·058 dwts. from 2·3 =89·47%
Washed Residue Assay ..	·281 dwts.	·05 dwts.	·35 dwts.	·25 dwts.	·55 dwts.
Comparative % Extraction from—					
Residue Assay	93·06%	97%	84%	87·2%	76·3%
Solution Assay ..	94·1 %	92%	85·4%	89·3%	89·47%

The above figures represent the exact results obtained by the Mines Trials' Committee (Johannesburg, Transvaal) in the Hendryx Agitator upon residues after Amalgamation.

The Following Figures shew the total Extraction from the Original Ore, including Amalgamation in the Mill:—

Total Extraction: by Amalgamation and KCy Solution—					
Figured from Residues	97·6%	99·0%	94·5%	95·5%	91·6%
Figured from Solutions	97·9%	98·0%	94·89%	96·2%	96·31%

THE MINES TRIALS' COMMITTEE IS NOT RESPONSIBLE FOR FIGURES RELATING TO ALMAGAMATION: WHICH ARE FURNISHED BY THE COURTESY OF THE WOLHUTER G.M. CO.

ACCIDENTS IN TRANSVAAL MINES, WITH SPECIAL REFERENCE TO FALLS OF GROUND.

" A Stream With Many Tributaries "—Mr. James Chilton's Reply to Discussion—Critics Answered—Is the Rate Excessive and Unwarranted?—Underground Discipline—Effects of Changes and " Hustle "—Valuable Conclusions.

Mr. Tom Johnson's practical wisdom can always command attention, and his long mining experience makes his contribution specially valuable, but the writer cannot agree that the angle of dip has no effect when considering roof pressures. Generally it will be found that when the force of gravitation is acting at right angles to the bedding planes, we have roof pressures at their maximum. Professor Yates, in the " Journal of the C.M. and M. Society," for June, 1907, gives an excerpt from Principal McNair's address before the American Society for the Advancement of Science, on " Deep Mining in the Lake Superior District," and in this address he says, *inter alia*, " At a dip of 38 degrees the pressure normal to the plane of the lode at 5,000 feet is only 354 tons per square foot. As the dip increases, the normal pressure diminishes, at 52 degrees it is 278 tons and at 70 degrees it is 152 tons per square foot.

Mr. Johnson thinks an increase in the number of mining inspectors is desirable. While admitting that the Transvaal Mining Inspectors are overworked, it must not be assumed that an increase in their number will lower the accident rate, unless it is intended to put one in every mine, a procedure that would arouse high indignation on Von Brandis Square. In West Virginia, U.S.A., during 1906, only four inspectors were in charge of that district, and it was thought that an increase in their number would tend to reduce accidents, so the number was raised to twelve, but it was found that the increased inspectorship had little effect, for accident rates still continued to rise. An increase in the number of inspectors would remedy the dust evil in our mines but would have little effect upon the accident rate.

My critic tells us that he can see little evidence of that hustle which is alleged to influence the accident rate so unfavourably. His lines must have fallen in pleasant places and his experience must be an unusual one. The increased hustle of the last five years can be traced to the advent of the tube mill and the greater crushing capacity of our mills. When our stamps were crushing 4 tons per head, mills could be filled up by Thursday, and mine officials and miners could slacken off, but now stamps crush 8 tons per head, and the mill is never full. To get the additional tons that are necessary now, requires a good deal of energy and organisation. Hustle is not necessarily synonymous with confusion and bewilderment, but it does mean the straining of every nerve to secure the desired end. Like Mr. D. Rees he does not see how big mills affect the accident rate as the rock handled per person in big mines is not greater than that handled per person in small mines. Statistics do not support this contention, for after some search the author has made out the following result for 1910 :—Mines with less than 1,000 employees have an average tonnage of 109 tons per employee per annum, while mines with over 3,000 employees have 151 tons per employee over the same period. This increase of tonnage in our large deep level mines partly accounts for the hustle that is associated with them.

Mr. Johnson says " There is no such thing as an air blast." The author is aware that the word is a misnomer, yet he prefers it to " explosive rocks," which is the American equivalent. His assertion that it is due entirely to roof pressure is not borne out by expert evidence. Mr. M. Rzchap in his treatise on the Tauren snd Wochein Tunnels says : " As these phenomena (air blasts) also appear in tunnels in which little rock has been mined out, it is evident that the neighbourhood of large empty areas upon which much stress has been laid is not a necessary condition of their appearance. There can be no doubt that the phenomena are due to the sudden release of tension in the crust of the earth." The State Mining Engineer in his report for 1097 says : " This (air blast) action is difficult to explain, but is probably due to local tension or unreleased strain existing in the rocks, and is not directly due to roof pressure." That these effects are so often seen in our deepest mines is probably due to depth. If these strains had existed nearer the surface, probably they would have released themselves in a slight earth tremor, but being buried so far down, only mining operations gives them an opportunity to show their powers.

Mr. Johnson raises the question of the effect of hours of labour on the accident rate. While it is difficult to formulate rules that will apply to all cases, one aspect of the question may be pointed out. Where labour is accompanied by excessive mental or physical fatigue, the lessening of the working hours may reduce the accident rate, that is, if the worker has been before the end of the shift in a state of exhaustion, but if the shortening of the hours of labour leads to an acceleration of speed or hustle, the tendency will be in the other direction. The Rand miner being practically a supervisor, cannot complain of excessive wear of muscle or brain, but as the shortening of hours will accentuate the pace, its tendency will be to increase the accident rate.

Dr. J. L. Aymard raises the question of how far illness contributes to the accident list. This is a question that is difficult to solve, but that it does contribute few persons will deny. In miners' phthisis, and, indeed, in most diseases that terminate by exhaustion, there comes a time when the body becomes insensitive to outside impressions and the common dangers of the mine have not message for the benumbed brain, and even if these are received, the body is often physically incapable of responding to the call. When a miner arrives at this stage he delegates a large portion of his work to his native assistants with the results one can easily imagine. Mine officials, having nothing but pity for these poor soldiers broken in the industrial wars, hesitate to enforce the regulations, realising that it very often is a case where the spirit is willing but the body is weak. In the suffering miner, the official sees a picture of his own future condition, and with that " fellow feeling that makes us wondrous kind," deliberately shuts his eyes to breaches of the mining laws. Time after time mining inspectors speak of accidents caused by some senseless and insane actions on the part of working miners, actions so devoid of motive, so aimless, so incomprehensible that doubts are sometimes cast on the mental conditions of the transgressor. In cases like these the author has often wondered if this mental haze is due to some subtle form of phthisis that makes its presence felt in the brainy citadel long before the ramparts are aware of the presence of the enemy. In the fight against miners' phthisis it must not be forgotten that victory will have far-reaching effects, extending far beyond the question itself, and its results will be seen in a contented community, a greater industrial activity and a lessened accident rate.

Mr. T. G. Trevor certainly touches a vital spot when he points out that an accident is " bad business." Let us look at the question from an entirely cynical and commercial point of view, and we find that in our mines we have a number of muscular machines called natives. Each of these machines brings in a profit of £30 per annum to its company. If some of these are put out of action or completely destroyed, this source of profit at once ceases. The question is—Does it pay to allow these machines to become useless by ignorance, carelessness or neglect? There can be only one answer, yet in 1910 we lost 915 of these muscular profit-producing machines by accidents largely preventable, and 1,268 were seriously disabled so as to reduce their profit-earning capacity. One of our mines lost 41 " machines " during 1910, another 37. If these had been rock-drills a big outcry would have been made.

Mr. J. E. Vaughan's duty as an Inspector of Mines brings him in touch with many mine accidents, and for this reason his paper is specially welcome. Too often are the valuable lessons taught by mining accidents locked up in official pigeon-holes and lost to the industry. Probably if more publicity were given to mining mishaps we should not have to complain so much of the ignorance of our miners. Mining inspectors, while quite willing to impart information privately, hesitate to give the general public the fruit of their experience and investigation. The author would be glad to see officers of the Mines Department entering into these discussions more frequently, though he realises that an almost obsolete Civil Service tradition is against this.

Mr. Vaughan does not consider it fair to make comparisons between the Rand and England, because in the latter country the underground workers are *miners*. Surely my critic cannot be unaware of the fact that 40 per cent. of the labour force in England cannot by any flexibility of language be called miners. It is made up of lads from 14 to 20 years of age, reckless, wilful, and often ignorant. Besides these there are men that drift in from other occupations, agricultural labourers, ex-soldiers and unsuccessful toilers in a thousand arts and trades. These all become underground operatives; some may in time become miners, but mining cannot be learned in a month, and many remain industrial undesirables all their lives. Probably the number of miners in any English mine does not exceed 50 per cent. of the total underground force, the remainder are simply lads or amateurs at mining work.

The appointment of roof inspectors as suggested receives a cold reception from Mr. Vaughan, he preferring to leave roof inspection in the hands of shift bosses. Unfortunately these officials are already overworked and cannot always spare the time necessary to make a careful and minute examination of roof conditions. The mining regulations demand that he should visit every working place in his section, and if he does this he will not have time to make an examination that will sometimes occupy an hour or even two. A roof inspector's duties are not set out in the regulations and if the investigation of roof conditions in any particular stope consumes a large part of his working day, he cannot be accused of neglect of duty, a charge that would at once be brought against a shift boss if he did not visit his working places.

(To be continued.)

Mr. W. L. Honnold sailed for Europe this week.

* * * *

Mr. Alfred Lewis is making extensive tours around the Union looking into the farming industry, and those contemplating farming would be well advised to consult him.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Illogical Precision in Mine Reports.

To the Editor, *South African Mining Journal.*

Sir,—My attention has been drawn to a letter, signed "Engineer," which appeared in the *South African Mining Journal* of June 8th. This letter is a criticism of an article published by you the previous week, which article, I find, consists of a number of extracts from my paper, "Illogical Precision in Mine Reports," read before the Institution of Mining and Metallurgy in May last. I am sensible of the compliment you have paid me by publishing extracts from the paper; at the same time, I am sorry it was not copied in its entirety, thus presenting the whole of the argument which I have put forward.

If your correspondent who calls himself "Engineer" will send to the Institution of Mining and Metallurgy a contribution to the discussion on the paper, or if he will be good enough to sign his proper name to communications to the Press, I shall be most pleased to reply to anything he has to say on the subject.

In the *S.A. Mining Journal* of July 13th you stated in an editorial that my paper was not worthy of serious discussion. Nevertheless, I would draw attention to the following facts: Of the fifty-eight productive mines of the Rand, twenty-two in January, 1912, treated tonnages which ended in two 0's, or which, in other words, were expressed to the nearest hundred tons. The corresponding number was twenty-one in February, eighteen in March, twenty-five in April, twenty-two in May, and twenty-six in June. In several instances the same mine has its tonnage stated each month to the nearest hundred.

That such a large percentage each month of Rand mines should treat exact multiples of one hundred tons is either an exceedingly remarkable series of coincidences, or it is unquestionably a concrete confirmation of the argument enunciated in my paper.—I am, etc.,

F. PERCY ROLFE.

P.O. Box 15, Langlaagte,
July 22, 1912.

"Let the Stick well fill the Hitch."

To the Editor, *South African Mining Journal.*

Sir,—I should interpret the Cornish saying to mean that the stick should well fill the excavated bottom, not the sides of the hitch. The best Cornish miners, I know, cut square hitches, then it is possible to see if the prop rests evenly on foot. The heading can subsequently be "moiled" so that the stick makes the required angles with foot hanging. If it be required to support roof the angle above the prop at head should be greater than a right angle, if to keep foot this angle should be less than a right angle. The average degree of dip of the stope should be considered in making these angles, isolated irregularities of floor and roof being neglected. As the weakest link is the strength of the chain, so if the stick be weakened to fit hitch, the bevelled end's diameter represents strength of prop, for it cannot adequately be braced by the sides of the hitch. Furthermore, these latter crumble away under pressure and weathering. If a beam be so braced at intervals as to prevent its bending at those points, then its length becomes virtually diminished and its strength increased. The old saying does not satisfy this condition. Hence the safe load of a prop may be miscalculated. Mr. A. Wilkes' criticism savours of malice, in that it connotes some hidden and valuable experience he will not give away. I am thankful to your correspondent for the term "underlie," for to be understood it is necessary to express oneself explicitly and scientifically. Bookish knowledge is set down by the "too practical man" as all wrong and only theory. The son, when he accompanies his father to the working face, is learning mining by theory, just as much as the youth in the classroom. The difference is only the way in which the respective mentors acquired their knowledge. The idea must be prior to the practical muscular work in either case. As the self-made merchant said to his son, "The man who will succeed in this business is the one who knows enough of the practical to test his theory." The application of acquired knowledge and scientific research must assert itself in mining as in other industries.—Yours, etc.

L. P. SHERIDAN.

Mill Site, Randfontein,
July 22nd, 1912.

Rand Geology.

To the Editor, *South African Mining Journal.*

Sir,—It is almost inconceivable that after years of investigation of our system, so much room for theorising, viewing and conjecturing should still exist, as is evident from the correspondence appearing in your journal. I am afraid that in spite of our boast of possessing more brains to the square inch than any other part of the world the quality lacks responsiveness and susceptibility to the impressions of truths. The views put forward by the "powers that be" are so conflicting, so at variance, so void of facts, and consequently so unconvincing, that even the lay mind is bewildered at the little wisdom by which we are being guided and shown the way. "Rhinesuchus" laid bare the weak spots in our method of investigation. No geologist or investigator, no matter what his academical qualifications may be, can hope to meet with success in wresting Nature's secrets from her, unless permeated with the love of truth. If we would only go to Nature, ever consistent, ever true, without our defective, faulty, preconceived views and allow her to speak and unravel her mysteries through and by means of her highest product, we should not be doing as we are to-day in forcing our misconceptions and misreadings on willing learners and seekers after truth. With startling suddenness one finds the centre of gravity shifted from Witpoortje, "the Mecca of the geologist," vide Mr. Scott Alexander, to the Geldenhuis Mill. Why those quartzites at the mill should have deceived Mr. Olver as they had done Drs. Corstorphine and Hatch appears to me incomprehensible, as there can be no shadow of a doubt about Nature's voice calling them Government quartzites, and not Hospital Hill quartzites, whereas the overlying bed of shale, called Blue Sky by Mr. Scott Alexander, is none other than the basic shale of the Jeppestown bed. Mr. Editor, is it excusable for professional men to commit such grave errors of judgment? By what name shall we call Mr. Scott Alexander's emphatic statement that there are no such things as Kimberley shales, when just a stroll along the railway line in the direction of the City Deep ought to satisfy him that there are such things as Kimberley shales. Do you not think, with me, Mr. Editor, that the Rand's only stratigraphist ought to "stop crowing" for a little while until such time as he knows a little more of the stratigraphy of the Rand? Yet another of our foremost geologists states in a most definite manner that no further discoveries of Main Reef may be looked for, and that nothing else of an economic value exists in the system beyond what we have. I know for a positive fact of a time when the estimable expert was looking through different glasses than those he is looking through to-day, a time when he saw Main Reef to the right of him, Main Reef to the left of him, Main Reef on Elandsvlei, on Witfontein, on Blesbokfontein, Kaalfontein, Rooikop, as far down even as Rietkuil. In those days Mr. Draper saw nothing but Elsburg where he sees Main Reef to-day. I suppose no man will be more agreeably surprised and quicker to modify his views should it be proved, "as it will be proved before we are many months older," that quite a good few miles of Main Reef, New Rietfontein, and Nigel have escaped the eagle eye of the eminent geologist. With very few exceptions we find, Mr. Editor, our geologists looking upon their own views, ideas, and theories, as constructive, and those held by the neighbour who may happen to differ as destructive. As a man of the veld, I wish in conclusion to express my appreciation of the magnificent work done by the Geological Survey, who have gone far in building up a cosmos out of chaos.—Yours, etc.,

ONLY A PROSPECTOR.

Are Mine Samplers Underpaid and Are They Efficient?

A GROWL FROM THE BOTTOM DOG.

To the Editor, *South African Mining Journal.*

Sir,—Are mine samplers underpaid and are they efficient is a question that should be answered, and involves a matter of great importance for the efficient working of all mines. As to the first point, the writer, who has been connected with the mines for a considerable time, cannot but say "Yes," that is samplers are underpaid for their toil and dangers during their working hours underground. The question is, then, "why are they paid such outrageous salaries?" their pay being from £12 10s. to £20 per month, and at the latter figure they remain on most mines as long as the sampler cares to remain, with little prospects of rising to something higher. There are, naturally, exceptions to the rule in all cases, more especially if you happen to have influence. Now, why is this so? I will now endeavour to throw some light upon this subject as far as my experience goes. As a rule post graduates, office clerks, and anyone in need of a job and with no fear of underground conditions, take to sampling, providing they are unable to get anything else to do. Now, a lot of these men have never been down a mine in their life, and have not the faintest geological training, and do not know the difference between a bit of quartz and a beach pebble; and these are the coming experts who start on the low wage and are put on the same standard as one who has been to college and has had some fundamental and practical training, and on the same earning basis too. After a few months, perhaps, they are earning up to £17 10s. per month, and by that time they are supposed to be full blown samplers and to know everything. It has further come to my knowledge that a young fellow, who has been penwiper twelve months previously, became head sampler of a big mine. How do you account for that? Influence and nothing else. Knowledge and practical training do not always play an important part in present-day mining. I can enumerate several other instances of similar occurences in a different department, but I must refrain at the moment from so doing as I shall later on touch on this department and its business methods. I think it is scandalous, to say the least of it, and who is responsible for such affairs? Yet the cry to-day is to train young men for mining, and I for one, should be very sorry indeed if I had to start over again and tackle mining. Why, its the most thankless and injurious occupation going, and under what conditions has one to work? In semi-darkness three-fourths of the day, inhaling foul air, dust and goodness knows what. Yet on the strength of it, we hear a lot of coaxing going on from certain quarters to the young men of South Africa to make a start and get ready to take the places of those with one foot in the grave already. I am penning these lines with conviction and nothing else. Now, who are responsible for these things? Surely not the head office, but those controlling the mines direct. There is undoubtedly something wrong and fishy about the management. Coming to the subject again, was it not remarked some time back in the medium of your journal that such departments should have the best-trained man, with practical, as well as theoretical knowledge, amongst their heads and assistants; but what do we find? As already mentioned, we find all classes, without a distinction. As a factor of great importance, does not the sampling department involve the whole working of the mine, and if the samplers are of such a type (with many exceptions), with the further knowledge that they are underpaid and have only to do a certain task and the book work of their records, and with little prospects for the future, what is the result? No good one for either side, as the man who is intelligent, and with no one to push him on, will not work with the same heart and interest as one who in encouraged and rewarded in due course for his knowledge and ability. The sampler has more risks than even the miner, as he is day in and day out at the working face, be it stope, raise, winze, or shaft bottom. The only thing in his favour is there is no night shift for him. There he is chipping away amidst the dust, wet and other trying conditions, and more liable to phthisis than even the miner, who is most of the time at his box, whereas the sampler, once on his job, remains there until he is finished. Then again, as to accidents in general, is he not more liable to such than the miner? Why, he is always in danger of his life through a misfire, falling material from above the level or stope whilst he may be sampling. Thank goodness we have not had many such occurances, but the possibilities are great. As to the hours, these men go down with the shift and remain underground until, perhaps, three o'clock, and are then supposed to return to the office to complete their records of the day's work. Practically a ten hours' day; and all for the munificient wages already mentioned. In conclusion, if the mining companies expect good and reliable results from that department, they must then pay for it, as any other department, and limit their learners, and employ more men who know their work. At present the system is "penny wise and pound foolish," and it comes out dear at the end. Just fancy a "clerk," enjoying fresh air and plenty of recreation, being paid more than the man who is wasting his life down below, and working under abnormal conditions. Is it not a crying shames to have it so. I could go on for some considerable time enumerating points, etc., but it will not serve any good purpose, so I will just remark once more that this branch of intelligence is underpaid, and if paid better the efficiency will surely increase in proportion, and the sooner this department is recognised as a most important branch of the mine, the better it will be for all concerned. The general talk is that the mines require the best men and brains and the highest efficiency, and it is for them then to give more encouragement to all. I trust my remarks will be for the good of those that are in need of some backing up, and also do justice to those that have been overlooked in the past. In furtherance of above I hope some abler pen than mine will take up this matter.—I am, etc.,

"FLOREAT."

East Rand, July 23, 1912.

The Price of Tin.

The present high price obtaining for tin is exciting interest in the search for this metal all the world over, and not only in the Transvaal but in Mashonaland, the Congo Free State and West Africa the search for cassiterite has been greatly stimulated by prices which have ranged at from £200 to £212 and over per ton. Messrs. Henry R. Merton & Co., Ltd., the well-known firm of British metal brokers, in a report just received and dated June 28th, state of tin: "The events in the copper market diverted the attention of operators from tin, which has of late not been much in favour with speculators, but the remarkable steadiness which it showed is beginning to create renewed interest. The holding up of large quantities here, through the strike, is gradually accentuating the shortage of supplies, and prompt material remained in good request not only by the trade, but also by Bears, and though quite important quantities were realised by speculative holders, they found a ready market at advancing prices. At the same time forward delivery was offered but sparingly, and those who wished to replace early metal found it difficult to do so, the more so as the East, though selling almost daily, did not come out with large quantities. When therefore towards the end of the week some speculative demand set in, prices quickly improved, and while cash tin advanced to £209 10s., the value of three months improved to £204. During the last few days America was more inclined to buy, and the scarcity of available metal there has once again become more pronounced. The position of this article is certainly very good with a large consumption going on everywhere, while the shipments from the Straits for this month are expected to be quite moderate. Closing prices are £209 cash, and £203 15s. for three months."

In the course of a paper on "Jewish Pioneers in South Africa," read before the Jewish Historical Society in London in mail week, Mr. Sidney Mendelssohn stated:—When you hear sneers at the Jewish capitalists of South Africa, and are told of these men having profited by the toil of the early pioneers of the diamond and goldfields, it may as well be known that a Jewish prospector—working with pick and shovel like the others—found the great mine, the discovery of which was the first step in the modern advancement and progress which has led to the establishment of the great Empire of South Africa of to-day. Many of the Jewish pioneers of the diamond fields have attained considerable distinction in recent times as captains of industry, financiers, military leaders, politicians, and even revolutionaries. Alfred Beit, the philanthropist and financier, was not born a Jew, though of Jewish race, but he was a liberal supporter of Jewish as well as other charities.

QUARTERLY REPORTS.

East Rand Proprietary Mines.

QUARTER'S PROFIT, £285,876.

During the quarter ended June 30th, 529,514 tons of ore were mined in the East Rand Proprietary Mines, and 473,250 tons milled. The total yield was 183.682.8 ozs. (7.7 dwts. per ton). The number of feet driven, risen and sunk (excluding shafts) was 14,270 feet; footage sampled, 10,367 feet; average reef channel widths, 26 inches; average assay value over reef channel widths, 11.2 dwts.; number of cubic feet excavated (stations, ore bins, etc.), in addition to the above footage, 125,594 cu. feet. The revenue from gold amounted to £785,985 (33s. 2d. per ton); the working expenditure of £500,108 (21s. 1d. per ton); and the working profit to £285,876 (12s. 1d. per ton). From the profit must be deducted approximately £50,798 to meet the quarterly proportion of the Government profit tax, interest on debentures, etc. The expenditure on authorised votes for the quarter was £55,031 11s. 6d., as under:—Reduction plant, £9,500 5s. 2d.; pumping and air plant, £2,200 4s. 7d.; new surface haulage, Driefontein to Angelo, and new crusher station, Driefontein, £5,853 17s.; native compounds, £2,967 16s. 1d.; shaft sinking, excavations, etc.. £22,962 10s. 5s.; sundry surface and underground equipment, £11,546 18s. 3d.; total, £55,031 11s. 6d. The actual expenditure on development amounted to £38,304 5s. 8d., as against £70,987 10s. provided in the working costs (at 3s. per ton), leaving a balance of £32.683 4s. 10d., which, added tu the balance at March 31, 1912 ,of £37.865 18s. 10d., gives a total of £70,549 3s. 8d. standing at the credit of development suspense account at June 30, 1912. This amount is treated as a liability in the cash position. The Hercules shaft has been dewatered, and 135 feet sunk, making the total depth of the shaft 3,153 feet. The Angelo Deep section has been dewatered to the 27th level, and driving will shortly be commenced. The installation of the permanent pumping plant in this section will now be proceeded with. The approximate financial position after providing for all liabilities, including dividend of 12½ per cent., but exclusive of the debenture issue of £1,500,000, is £193,967; less cash assets (stores and materials, sundry debtors, payments in advance, etc.), £146,756—balance, approximate cash position. £47,211

New Unified.

The report of the directors for the three months ending, June 30th, states:—

Mine.—Number of feet driven, sunk, and risen, exclusive ot stopes, 1.191.5 feet; ore developed (milling basis), 27,754 tons. Mill.—Tons crushed, 32,160 tons; yield in fine gold, 8,400.801 ozs.; yield per ton, fine gold, 5.224 dwts. Cyanide Works.—Tons treated (exclusive of accumulated slime), 32.010 tons; yield in fine gold, 3,320.989 ozs. Total Yield (exclusive of accumulated slime).—Yield in fine gold from mill and cyanide works, 11.721.790 ozs.; yield in fine gold per ton milled, 7.289 dwts. Accumulated Slime Treatment.—Yield in fine gold, 238.824 ozs. Working Expenditure and Revenue (on basis of 32.160 tons milled).—Total yield, £49.790 19s. 9d. (30.964s. per ton milled): total gross profit, £15,357 8s. (No allowance has been made in above for profits tax.) Gross profit (as above), £15,357 8s.; less capital expenditure, £1,593 19s. 3d.; net profit, £13,763 8s. 9d. General Remarks.—Dividend (interim) No. 8 of 10 per cent. (two shillings per share) has been declared payable to shareholders registered at 29th June, 1912. The gross profit was higher than that for the previous quarter by £1,214. This was due to an increase in the quantity of ore milled of 750 tons, and a reduction of over fourpence per ton in the working costs. The tube mill has run very satisfactory throughout the quarter, and the residues have been reduced to a low figure. The main incline shaft was sunk 75 feet to a total depth of 2,638 feet. The shaft has almost reached its final depth, and the driving of the bottom level of the mine will shortly be put in hand. The values exposed as the result of development operations continue to prove satisfactory.

New Rietfontein.

The report of the directors for the three months ending, June 30th, states:—

Mine.—Number of feet driven, sunk, and risen, exclusive of stopes, 1,811 feet; ore developed (milling basis). 14,719 tons. Mill.—Tons crushed. 45,926 tons; yield in fine gold. 10,408.315 ozs.; yield per ton fine gold, 4.532 dwts. Cyanide Works.—Tons treated, 46.674 tons; yield in fine gold, 3,961.857 ozs. Total Yield.—Yield in fine gold from mill and cyanide works, 14,370.172 ozs.; yield in fine gold per ton milled, 6.257 dwts. Working Expenditure and Revenue (on basis of 45,926 tons milled).—Total yield, £61,040 11s. 4d. (26.582s. per ton); total gross profit, £11,427 16s. (No allowance has been made in above for profits tax). Gross profit (as above), £11,427 16s.; less capital expenditure, £1,208 2s. 7d.; net profit, £10.219 13s. 5d. General Remarks.—The tonnage crushed was lower than that for the previous quarter by 3.205 tons, and as a result the gross profit was reduced by £1,032. No. 1 shaft was sunk 53 feet, and has reached an inclined depth of 1,473 feet. Reef of satisfactory value has been exposed in the 12th level west drive, which has now reached a distance of 579 feet from the shaft.

Witwatersrand.

The report of the directors for the three months ending, June 30th, states:—

Mine.—Number of feet driven, sunk, and risen, exclusive of stopes, 2,320 feet; ore developed (milling basis), 97,595 tons. Mill.—Tons crushed, 118,180 tons; yield in fine gold, 20,178.371 ozs.; yield per ton, fine gold, 3.415 dwts. Cyanide Works.—Tons treated, 119,100 tons; yield in fine gold, 12,434.466 ozs. Total Yield.—Yield in fine gold from mill and cyanide works, 32.612.837 ozs.; yield in fine gold per ton milled, 5.519 dwts. Working Expenditure and Revenue (on basis of 118,180 tons milled).—Total yield, £138,530 10s. 3d. (23.444s.); total gross profit, £57,874 13s. 1d. (No allowance has been made in above for profits tax). Gross profit (as above), £57,874 13s. 1d.; less capital expenditure, £3,336 13s. 2d.; net profit, £54,537 19s. 11d. General Remarks.—Dividend (interim) No. 16 of 17½ per cent. (three shillings and sixpence per share) has been declared payable to shareholders registered at 29th June, 1912. The amount expended on shaft sinking and equipment of the southern section was £19,759 9s. 9d. The quantity of ore crushed was increased by 12,470 tons as compared with the tonnage milled during the previous quarter, and working costs were reduced by 1s. 4d. per ton. As a result there was a considerable improvement in the gross profit realised, which was higher than that for the first quarter of the year by £8,943. The vertical shaft was sunk 333 feet, and has reached a total depth of 1.636 feet. The northern incline shaft was sunk 126 feet to a total depth of 1,024 feet. The development of the section of the mine served by this shaft continues to expose reef of satisfactory value, and, considered as a whole, the position at the mine is most encouraging.

Glencairn.

The report of the directors for the three months ending, June 30th, states:—

Mine.—Number of feet driven, sunk, and risen, exclusive of stopes, 461 feet; ore developed (milling basis), 29,120 tons. Mill.—Tons crushed, 57,521 tons; yield in fine gold, 5,954.518 ozs.; yield per ton (fine gold), 2.070 dwts. Cyanide Works.—Tons treated (exclusive of accumulated slime), 57,153 tons; yield in fine gold, 4,603.939 ozs. Total Yield (exclusive of accumulated slime).—Yield in fine gold from mill and cyanide works, 10,558.487 ozs.; yield in fine gold per ton milled, 3.671 dwts. Accumulated Slime Treatment.—Yield in fine gold, 912.122 ozs. Working Expenditure and Revenue (57,521 tons milled).—Total yield, £44,849 11s. 10d. (15.594s. per ton); total gross profit, £8,534 0s. 9d. (No allowance has been made in above for profits tax). Gross profit (as above), £8,531 0s. 9d.; less capital expenditure, £1 18s. 4d.; net profit, £8,532 2s. 5d. General Remarks.—The quantity of ore millled shows an increase of 4,270 tons, as compared with the tonnage crushed during the previous quarter, and the total gross profit is higher by £762. A certain amount of prospecting work is still being carried out, and a surface winze on the south reef in the Knights Tribute section has disclosed an unworked block of ground of fair value.

New Primrose.

The report of the directors for the three months ending, June 30th, states:—

Mine.—Number of feet driven, sunk, and risen, exclusive of stopes, 1,484 feet; ore developed (milling basis), 58,251 tons. Mill.—Tons crushed, 72,200 tons; yield in fine gold, 15,668.720 ozs.; yield per ton (fine gold). 4.340 dwts. Cyanide Works.—Tons treated (exculsive of accumulated slime), 68,584 tons; yield in fine gold, 8,036.150 tons. Total Yield (exclusive of accumulated slime),—Yield in fine gold from mill and cyanide works, 23,704.870 ozs.; yield in fine gold per ton milled, 6.566 dwts. Accumulated Slime Treatment.—Yield in fine gold, 1,099.307 ozs. Working Expenditure and Revenue (on basis of 72,200 tons milled).—Total yield, £100,691 17s. 6d. (27.893s. per ton); total gross profit, £53,569 18s. 5d. (No allowance has been made in above for profits tax). Gross profit (as above), £53.569 18s. 5d.; less capital expenditure, nil; net profit, £53,569 18s. 5d. General Remarks.—Dividend (interim) No. 38 of 25 per cent. (five shillings per share) has been declared payable to shareholders registered an 29th June, 1912. It was found possible to increase the quantity of ore crushed, with the result that the tonnage milled was higher than that for the previous quarter by 3,000 tons. This was directly reflected in the profit realised, which shows an increose of £2,525. Working costs have been kept at a low figure, and the grade of the ore has remained remarkably steady. With a view to improving the extraction, it has been decided to erect a tube milling plant, and arrangements are in hand for the installation of two tube mills.

Ginsberg.

The report of the directors for the three months ending, June 30th, states:—

Mine.—Number of feet driven, sunk, and risen, exclusive of stopes, 276 feet; ore developed (milling basis), 14.130 tons. Mill.—Tons crushed, 41,893 tons; yield in fine gold, 10,104.973 ozs.; yield per ton (fine gold), 4.824 dwts. Cyanide Works.—Tons treated, 42,221 tons; yield in fine gold, 4,946.07 ozs. Total Yield.—Yield in fine gold from mill and cyanide works, 15,051.043 ozs.; yield in fine gold per ton milled, 7.185 dwts. Working Expenditure and Revenue (on basis of 41,893 tons milled).—Total yield, £63,932 14s. 2d. (30.522s. per ton milled); total gross profit, £20,483 15s. 5d. (No allowance has been made in above for profits tax). Gross profit (as above), £20,483 15s. 5d.; less capital expenditure, £919 1s. 5d.; net profit, £19,564 14s. General Remarks.—Dividend (interim) No. 18 of 15 per cent. (three shillings per share) has been declared payable to shareholders registered at 29th June, 1912. The quantity of ore crushed was increased by 2,988 tons, and working costs were reduced by sixpence per ton. As a result, the gross profit showed an increase of £2,380 as compared with that realised during the previous quarter. The tube mill plant continues to give satisfactory results. The north shaft was sunk 87 feet, to a total inclined depth of 1,511 feet. No driving is being done at the present time, but winzing and rising through certain blocks is proceeding; a certain amount of cross-cutting has been carired out during the quarter in what were looked upon as very poor sections of ground, with the result that better leaders have been found than those originally driven on. On the whole, the position at the mine is encouraging.

Consolidated Langlaagte.

The report of the directors for the three months ending, June 30th, states :—

Mine.—Number of feet driven, sunk, and risen, exclusive of stopes, 1,719 feet; ore developed (milling basis), 44,820 tons. Mill.—Tons crushed, 60,480 tons; yield in fine gold, 10,598.702 ozs.; yield per ton (fine gold), 3.505 dwts. Cyanide Works.—Tons treated (exclusive of accumulated slime), 56,533 tons; yield in fine gold, 7,719.606 ozs. Total Yield (exclusive of accumulated slime).—Yield in fine gold from mill and cyanide works, 18,318.308 ozs.; yield in fine gold per ton milled, 6.058 dwts. Accumulated Slime Treatment.—Yield in fine gold, 2,797.118 ozs. Working Expenditure and Revenue (on basis of 60,480 tons milled).—Total yield, £77,811 4s. 6d. (25.731s. per ton milled); total gross profit, £27,730 10s. 4d. (No allowance has been made in above for profits tax). Gross profit (as above), £27,730 10s. 4d.; less capital expenditure, £124 2s. 10d., debenture interest, £1,125—£1,249 2s. 10d.; net profit, £26,481 7s. 6d. General Remarks.—The expenditure on the southern section amounted to £117,011 7s. 11d. The gross profit shows an improvement to the extent of £3,367 as compared with that for the previous quarter. There was an increase in working costs, but as against this the grade of the ore milled was about half a dwt. better, with the result that the revenue from gold was increased by over two shillings per ton. The profit from the accumulated slime was also higher than during the previous quarter. The east shaft was sunk 214 feet, and has reached a depth of 36 feet below the 8th level station, and a total depth of 2,376 feet. The west shaft was sunk 142 feet, to a total depth of 2,456 feet, which was 238 feet below the 8th level station. Driving at the plane of the 8th level has been started at the west shaft, and at the east shaft a cross-cut south is being driven to intersect the reef. The total development footage accomplished at the southern section amounted to 5,133 feet, made up as follows :—Driving on reef, 2,002 feet; rising, 909 feet; winzing, 891 feet; cross-cuts, etc., 1,331 feet. At the 30th June the ore reserves at this section stood at 1,921,116 tons, which have been classified as follows :—Payable, 1,439,840 tons of an average assay value of 8.47 dwts.; unpayable, 481,276 tons of an average value of 2.30 dwts. The new reduction plant was completed and ready to start on the 1st July, but unfortunately the Victoria Falls and Transvaal Power Company, Limited, has been unable to supply the necessary power, and until this is forthcoming it will not be possible to run the new mill. In the meantime milling with the old plant is being continued. The Power Company has indicated that it will probably be able to supply the necessary power to run the new plant by the middle of September.

Government Gold Mining Areas.

The report of the directors for the three months ending, June 30th, states :—

North-East Shaft.—This shaft was sunk 250 feet to a total depth of 2,080 feet. The shaft was in quartzite throughout the quarter. Progress in the shaft has been slow owing to an increase in the quantity of water to be dealt with. The increased flow of water was introduced by a fault in the formation, which was encountered about the end of March. Unfortunately, the fault continued in the shaft throughout the quarter, with the result that the water followed the shaft down, and acted as a deterrent to rapid sinking.

North-West Shaft.—This shaft was sunk 448 feet to a total depth of 2,520 feet. With the exception of two reef stringers at 2,357 feet and 2,376 feet, the formation consisted of quartzite to a depth of 2,395 feet, at which point the Main Reef was intersected. The reef proved to be a well-defined body dipping 15 degrees to the south, and averaging 31 inches in thickness. The average of samples taken from all four sides of the shaft gave an assay value of 7.15 dwts. The shaft was continued in the footwall shale to provide for a sump and ore bin.

South-East Shaft.—This shaft was sunk 509 feet to a total depth of 2,480 feet. At 1,980 feet the shaft passed out of quartzite into the Kimberley slates, which continued to a depth of 2,120 feet. From this poiot the formation consisted of quartzite to 2,420 feet, when 4 feet of dyke matter was encountered, underlying which the quartzite continued to 2,459 feet. Below this depth the shaft has been amygdaloidal diabase.

South-West Shaft.—This shaft was sunk 585 feet to a total depth of 1,551 feet. The formation passed through consisted of quartzite with layers of reef matter. A reef 7 feet thick was intersected at 1,050 feet, and at 1,110 feet another reef, with large pebbles, was encountered. This reef proved to be 57 feet in thickness. A dyke, 7 feet thick, came into the shaft at 1,189 feet. Underlying this, alternate bands of reef and quartzite were exposed, and at 1,290 feet the shaft passed into a conglomerate with large scattered pebbles. This continued for 50 feet, when the quartzite was again encountered. None of the reefs encountered in this shaft contained more than minute quantities of gold.

Surface Equipment.—The railway sidings to the two southern shafts have been completed, and coal is now being delivered direct by rail to the shaft bunkers. The S.A.R. authorities are busy with the erection of the bridge over the Witbank line. This bridge is necessary to connect the two northern shafts with the sidings system, and we are only waiting the completion of the bridge to bring the siding to the northern shafts into operation. Plans are being prepared for the erection of the manager's house, assay office, and permanent general offices.

General.—The native labour supply has continued satisfactory. Now that the reef has been struck in the north-west shaft, the development of the mine will be put in hand immediately, and the work of cutting the main station will be started in July.

Van Ryn Deep.

The report of the directors for the three months ending, June 30th, states :—

Shafts.—The east incline was sunk 149 feet to a total detph of 2,649 feet, and the 6th level was started at an incline depth of 2,490 feet. The main bin connecting the incline with the vertical shaft was holed. The west incline was sunk 335 feet to a depth of 2,062 feet. Development.—The total footage driven, risen and sunk, exclusive of shaft sinking, amounted to 4,198. The footage is lower than that accomplished during the previous quarter, owing to an inflow of water on the 5th level east at the east shaft, which necessitated the temporary stoppage of some faces. Pumps have been installed to deal with this water, and no further trouble is anticipated. The ore reserves were increased by 110,422 payable milling tons of an average value of 10.18 dwts. At the end of the quarter the payable ore reserves stood at 790,818 milling tons of a value of 7.50 dwts., and there were also developed 347,498 tons of unpayable ore of a value of 3.06 dwts. The development in the eastern section of the mine at the fourth, fifth, and sixth levels was gratifying in value, although the amount accomplished was not so great as it would have been under normal conditions. In the central section of the mine values also were satisfactory. There were some encouraging features in the western drives, although this section of the mine is very irregular in value and not so promising as the other two. Surface.—A start has been made with the excavations for the reduction plant, and orders have been placed for a considerable part of the new equipment, which will comprise eighty heavy stamps and eight tube mills. The sands plant will include three collecting tanks, from which the sand will be conveyed by a Blaisdell distributor to eight treatment tanks. The slimes plant will be on the lines of the Butters' Filter Press process. The completed plant will be capable of treating 40,000 tons of ore per month. The erection of workshops, general offices, a manager's house and staff quarters are well in hand.

Solomon's Temple Tins.

The following cable has been despatched to the London office of the Solomon's Temple Tin Mines, Ltd.: "Manager reports on July 20th: All pipes looking strong, namely, 'D,' 18 inches in diameter, continues to yield 60 per cent. oxide; 'A,' 16 inches diameter, yields 50 per cent. oxide; 'B,' 18 inches by 6 inches, yields 45 per cent. oxide; 'C,' 6 inches diameter, yields 40 per cent. oxide. They are all in the same heading, which measures 4 feet 6 inches square."

Gold in Coal.

"Mining Science" states that an interesting feature about the coal mined at Cambria, Wyo., U.S.A., is that it is claimed to be gold-bearing. Some of the coal has contained as much as 8s. 4d. per ton in gold, and the coal was sold for only 6s. 3d. per ton. When coke made at Cambria was selling for 14s. 7d. per ton, samples were taken from 31 cars during a period of three weeks and assayed. The samples showed an average of 6s. 1d. per ton in gold and 14d. in silver. The explanation offered for the presence of gold in this coal is that the sands which submerged the old peat bog and now form the roof of the coal bed were derived in part from gold-bearing alluvium. While the sand was being deposited the gold worked down into the underlying bog, and is now found in the coal.

Rhodesian Section.

LATEST MINING NEWS.

Activity at Wankie—Matabele Queen's Mill—Lonely Developments—A New Gatooma Strike—The Eldorado Line—Outlook in the Gatooma District—Shamva Ore Reserves—The Lubumbashi Smelters—Bechuanaland Copper—The Moss Mill Started.

We learn that great activity is being displayed at the Wankie Coal Mine, in Northern Matabeleland. Not only is a coking plant of substantial size being erected, but the company is preparing for a larger output of fuel. The coke plant is being put up for the purpose of supplying the Lubumbashi smelters of the Tanganyika Concessions Company.

* * * *

The secretary of the Matabele Queen's G.M. Company has issued the following statement: "The reduced output for May recently published was caused by the mill being stopped to connect up the new supplementary water supply. With reference to this the following cable has just been received: 'Consider water position assured, and should enable mill to run full time.'—Heyman."

* * * *

The following is an extract from a cablegram which was despatched from Bulawayo to the Board of the Lonely Reef G.M. Company, in London on the 26th June: "No. 7 level south drive 700 to 715 ft., average width of reef is 15 ins., assaying 1 oz. 15 dwts. 16 grains. No. 8 level north drive 105 to 115 ft., average width of reef is 42 ins., assaying 3 ozs. 17 dwts. Reef in face 25th July shows slight pinching in floor, probably only local. No. 8 level south drive 85 to 100 ft., average width of reef is 78·6 ins., assaying 4 ozs. 8·34 dwts."

* * * *

Reports are to hand from Gatooma to the effect that an important strike has been made on ground near the Umsweswe River, some four miles to the south of Gatooma and about a mile and a half from the railway. So far as is known, the discovery is confined to four blocks of claims owned by Messrs. Fisher and Crooks, of Gatooma, and known as the Rocky Blue, but extensions for a considerable distance all round have been pegged, and quite a number of prospectors are on the scene, where considerable excitement prevails. Developments of an exploratory nature are being eagerly carried on. Values are said to go up to 5 ozs. to the ton.

* * * *

We are given to understand that definite arrangements have just been concluded in London for the widening of the gauge of the Eldorado line from Banket Junction. The distance is 64 miles. The work is to be taken in hand without delay. A standard gauge line to Eldorado will be an immense convenience to the mines and the farmers in the adjoining districts, since it will obviate the extra handling of goods which is now necessary on transhipment from the wider to the narrow gauge. The completion of the work should also strengthen the hands of those who are now agitating for an extension of the line to the Golden Kopje, 18 miles away.

* * * *

A Gatooma correspondent, in the course of a letter received this week, writes of the outlook in that district: "We are under a cloud here just now. Lately the London and Rhodesia relinquished their option on St. Olwyn (Fletcher's). They sunk a vertical shaft 100 feet in hanging wall, crosscut to reef, which gave 11 dwts. over 22 inches. They then drove 45 feet each way in unpayable values, and "pulled out." They had not got to sulphide zone. I have no doubt we will emerge from our obscurity in a year or so. If this were America, we would advance by leaps and bounds."

* * * *

The statement of development on the Shamva mine for the quarter ended June 30th shows that 50,133 tons of ore had been opened up, the assay value being 5 dwts. reduced. The ore developed during the previous quarter totalled 283,740 tons of an average value of 7·28 dwts. reduced. The total tonnage developed to the end of March was 2,091,859, of an average value of 4·97 dwts. A cable despatched last week from the local office of the company to the London Board stated: "Crosscut No. 5 north, No. 3 level, from 20 ft. to 25 ft., average value 4·3 dwts. Winze between levels 3 and 4, depth attained 35 ft., average value of last 5 ft., 7 dwts. over 83 ins. The latter figures refer to the lowest point yet reached in the mine."

* * * *

It is rumoured that Mr. Allan Gibb, consulting engineer, and Mr. Halewyck, general manager, will not return to the Lubumbashi smelting works, but that the late manager, Mr. P. K. Horner, will return in August, bringing with him another expert from the United States.

* * * *

The following cablegram was despatched recently to the Board of the Bechuanaland Copper Company in London regarding the Bushman mine: "No. 3 shaft, 300 ft. level—Long crosscut intersected copper lens assaying 8·2 per cent. over 18 ins. No. 5 shaft, 200 ft. level—V lens south face assays 6 per cent. over 16 ins. No. 7 shaft, 200 ft. level—7A lens south assays 15 per cent. over 8 ins."

* * * *

The Moss mine, which is leased on tribute from the Exploring Land and Minerals Compayn, Ltd., consists of two blocks of claims in the Sebakwe area of the Rennie-Tailyour Concessions, and the tributors are those two well-known local gentlemen, Messrs. A. C. Morrisby and W. James. Three weeks from the time they took over the tribute, the plant was ready for crushing, which reflects great credit upon the tributors. The opening ceremony took place on Saturday last, and was attended by Mr. T. Haddon, manager of the Globe and Phœnix mine, and Mrs. Haddon, Miss Crowther, Mr. Aston, A.R.M., Que Que, and Mrs. Aston, Mr. and Mrs. Hendricks, Mr. Story, manager, Standard Bank, Que Que, Mr. and Mrs. A. Haddon, and Messrs. Boyle and Magnus Spence. The Tremain mill was formally started by Mrs. T. Haddon and Miss Crowther, Miss Crowther performing the christening ceremony. After watching the amalgam pile up on the plates for a little while, an adjournment was made for luncheon.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

SHAMVA DEVELOPMENT.

To Crush in a Year—Ore Developed 2,141,992 Tons.

At the annual meeting of the Shamva, held in London in mail week, the Chairman anticipated that the mine would be crushing in a year. The salient points in last year's work were the largely-increased tonnage developed and the enhanced value thereof; 1,072,746 tons, valued at 6·17 dwts., have been developed during the past year, bringing the total ore in sight to 2,091,859 tons, assaying 4·97 dwts. The tonnage developed at the date of last report was 1,019,113 tons, assaying 3·72 dwts., and the total tonnage has increased by 1·25 dwts. Mr. Piper is wisely conservative both in his estimates and forecasts, and he has thus not reminded shareholders that the sampling in bulk referred to in the last report not only confirmed the mine assay but added 20 per cent. in value thereto, which was not taken into account in valuing the ore reserves, but which gives a very useful margin of safety. In April last there was a regrettable breakdown of the gas engine upon which the mine depended to supply air for the drills, and development has consequently been temporarily retarded. This engine has, however, recently been replaced, and in spite of this set-back a further 50,133 tons, of an average assay value of 5 dwts., have been developed since then, so that there is a total of 2,141,992 tons of nearly 5 dwts. ore developed at this date. "In this connection," said the chairman, "I venture to say, in addition to this official statement, that there is every probability of a very large further lower grade tonnage on the levels at present developed, which will prove payable, though, of course, in a much smaller degree; so that we should start operations not only with about four years' development ahead, but with probably a reserve far beyond that. As you will have gathered from the report before you, the 1st and 2nd levels are fully developed, whilst the 3rd level is not as yet defined and will still take some months to prove. Meanwhile it had disclosed on 31st March 268,740 tons of an average value of about 5 dwts., or a total of 318,873 tons, of an average value of about 7 dwts. The geological causes of the disturbance at this level are dealt with by Mr. Piper, and can only be solved as work progresses, which, as I have already informed you, has until recently been retarded. As regards the 4th level, there is not much to be said at present. The main adit, which was 328 feet in at the date of our last report, is being continued to cut the lode, but the winzes started from the 3rd level struck water, and this work had to be temporarily discontinued until we could re-establish the air compressor. A cable to hand this morning informs us that this winze from the 3rd to the 4th level is now down 30 feet, averaging at that depth 2·7 dwts., the hanging wall assays being 4 dwts. over 44 inches, which is satisfactory evidence that we are in values."

PROGRESS OF MINING AT KATANGA.

A Disappointing Report.

During the year 1911, there were issued at Katanga, Congo State (according to H.M. Vice-Consul), 111 prospecting licences and 136 claims were pegged (precious metals, 26; other mineral substances, chiefly copper and iron, 110), covering a total area of 217,916 hectares. No exact details are forthcoming as to the nationality of the prospectors, but, roughly speaking, about 28 were British, and of this number 18 were in the employ of Belgian companies, 3 in that of the Tanganyika Concessions, Ltd., and the remaining 7 were working independently, though it must be added that at least two of them were in the private employ of a Belgian. Of the claims pegged, 67, covering a total area of 97,026 hectares (precious metals 863·5 hectares, other mineral substances, 96,162.5 hectares) were granted to British subjects. Of these claims, 17 were granted to British subjects working on behalf of Belgian companies and the remainder to independent prospectors. It is too early as yet to gain reliable information as to the value of the recent discoveries made, but it is generally admitted that, with the exception of gold and diamonds, several years must elapse before deposits of minerals, of whatever value, which lie beyond the territory controlled by the Union Miniere, can be worked at a profit. A few claims have been pegged out in the district through which the railway from Sakania to Elisabethville runs, but the majority are far distant from transport facilities, and it is obvious that copper, tin and iron cannot be worked under such conditions. No important gold discoveries have been made of late, so far as is known, while work on the Kundelungu diamond pipes has been so handicapped by lack of labour that no opinion can be given as to their value. Prospectors have, in short, been disappointed; they were aware on their arrival that the country is far from the coast and that working expenses were bound to be heavy, but they did not take into account the fact that the most highly mineralised portion of the Katanga, to the extent of one-third of the district, is in the hands of the Union Miniere, and as they worked their way to the regions beyond the main belt they found their difficulties and expenses increased far more than they expected, owing to the high price paid for carriers at Elisabethville and the scarcity of food for the first 100 to 150 miles.

Rhodesia Land Case Judgment.

Judgment was delivered last week in the case in which the Bechuanaland Exploration Company sued the Chartered Company for an order compelling them to issue title to 3,000 morgen land pegged in the neighbourhood of the Lonely mine by the plaintiffs under letters of registration granted to a pioneer and subsequently acquired by them, this, *inter alia*, giving perpetual right to peg and locate such land. This land was located a year ago, but title was refused. Plaintiffs also claimed royalties amounting to £4,000 on mining timber and firewood cut from the land by mining contractors since their alleged acquisition of it, as well as an account and payment of moneys received in respect of leases by the Chartered Company. Alternatively, they claimed £9,000 damages. The Chartered Company pleaded that there had been a subsequent reservation of land both by Government notice and departmental notice. The Court held that the only reservation that could hold was for public purposes, and gave judgment for the plaintiffs, ordering the issue of title, with £3,000 damages in respect of the wood and timber, and payment of the rents; and failing issue of title a further payment of £2,000 damages

WITWATERSRAND GOLD PRODUCTION.

1887: World's Production £21,735,000, Witwatersrand £81,045—1911: World's Production £97,233,000, Witwatersrand £33,543,479—The Astonishing Rise of the Rand—From Nil to More than a Third in 25 Years.

In another part of this issue is given, in connection with the Transvaal gold dividends, a statement of the whole gold production of this Province from the earliest recorded years. The following tables show the yearly yield of the Witwatersrand from 1887 to 1911 inclusive:—

Year.	Tons Milled.	Fine Gold. Ozs.	Value. £
1887	—	19,080	81,045
1888	—	171,789	729,715
1889	—	306,167	1,300,514
1890	—	408,569	1,735,491
1891	—	601,810	2,556,328
1892	—	1,011,743	4,297,610
1893	2,215,413	1,221,171	5,187,206
1894	2,830,885	1,639,252	6,963,100
1895	3,456,575	1,845,875	7,840,779
1896	4,011,697	1,851,422	7,864,341
1897	5,325,355	2,491,593	10,583,616
1898	7,331,446	3,564,581	15,141,376
1899	6,639,355	3,317,857	14,093,363
1900		See below.*	
1901	412,006	238,877	1,014,687
1902	3,416,813	1,690,096	7,179,074
1903	6,105,016	2,859,482	12,146,307
1904	8,058,295	3,653,794	15,520,329
1905	11,160,422	4,706,433	19,991,658
1906	13,571,554	5,559,534	23,615,400
1907	15,523,229	6,220,227	26,421,837
1908	18,196,589	6,782,538	28,810,393
1909	20,543,759	7,039,136	29,900,359
1910	21,432,541	7,228,311	30,703,912
1911	23,888,258	7,896,802	33,543,479
Totals	—	72,326,139	£307,221,919
Add	—	34,607	*147,000
	—	584,841	†2,484,247
	—	4,447	‡18,890
Grand totals ...	—	72,950,034	£309,872,056

*Estimated unrecorded output for years 1887, 1888 and 1889.

†Undeclared output for period October, 1899, to May, 1900 (inclusive).

‡Amount won in 1904, but undeclared.

By way of comparison, the following table, based mainly upon figures in the report of the Directors of the United States Mint, will be of interest. It represents the estimated value of the gold production of the world since 1887:—

Year.	Value.	Year.	Value.
1887 ...	£21,735,000	1899 ...	£63,027,000
1888 ...	22,644,000	1900 ...	52,312,000
1889 ...	25,375,000	1901 ...	53,630,000
1890 ...	24,121,000	1902 ...	60,975,000
1891 ...	26,846,000	1903 ...	67,337,000
1892 ...	30,134,000	1904 ...	71,380,000
1893 ...	32,363,000	1905 ...	78,143,000
1894 ...	37,229,000	1906 ...	82,707,000
1895 ...	40,843,000	1907 ...	84,769,000
1896 ...	41,559,000	1908 ...	90,810,000
1897 ...	48,509,000	1909 ...	93,695,000
1898 ...	58,949,000	1910 ...	96,446,000
		1911 ...	97,233,000

The relative percentages of output during 1911 have been estimated as shown below:—

Country.	Value.	Percentage of Total.
Transvaal	£34,991,620	36·0
United States	19,774,000	20·3
Australasia	12,549,000	12·9
Russia	8,313,000	8·6
Mexico	4,007,000	4·1
Rhodesia	2,681,000	2·8
Canada	2,188,000	2·3
India	2,159,000	2·2
West Africa	1,083,000	1·1
Other countries	9,457,000	9·7
	£97,232,620	100·0

West Rand Unified.

An ample supply of water has now been obtained through the courtesy of the Randfontein Estates, the owners of the stream upon the farm Waterval, and crushing operations are now being carried on unhindered.

ANSWERS TO CORRESPONDENTS.

"Premier Gold."—Our note did not profess to discuss the finances of the company, which may or may not be as you say "fantastic." As a fact, we did, at the time of the flotation, dwell on the extraordinary features you mention.

"Penwith."—The company will be finally wound up on October 5th.

"Once Bitten."—There is no hurry—the property is quite unproved. Better pay a little more and improve your acquaintance with the facts.

INVESTORS' DIARY.

The following company meetings have been announced:—

Aug. 30.—Treasury Gold Mines; Wit. Deep; Crown Mines.
Sept. 4.—New Kleinfontein.
Sept. 21.—Wit. Deep.
Sept. 23.—Crown Mines.
Sept. 27.—Sub-Nigel; Simmer and Jack Prop.; New Kleinfontein; Wolhuter, G.M.
Oct. 19.—Wolhuter G.M.

Notices of Reduction and Increase of Capital.

The New Rand, Ltd., Johannesburg; registered June 25; capital increased from £135,802 to £136,457.

Ferreira Deep, Ltd., Johannesburg; registered June 18; capital increased from £910,000 to £980,000.

Lydenburg Gold Farms Co., Ltd., Johannesburg; registered June 6; capital decreased from £250,000 to £50,000.

Aurora West United Gold Mining Co., Ltd., Johannesburg; registered June 15; capital decreased from £212,705 to £106,352 10s.

Engineering Supplies, Ltd., Johannesburg; registered June 25; capital increased from £28,000 to £30,000.

THE MINERALS OF THE MURCHISON RANGE AND DISTRICT.—VI.

Account of the Haenertsburg and Woodbush Goldfields—Gold-bearing Deposits of the Black Reef Series—An Important Government Report on the Results.

4. *The Palabora Copper Fields, including the Associated Workings of Lulu Kop and District.*—Scattered more or less throughout the somewhat indefinite area known as Palabora are a large number of ancient workings, specially prominent over the slopes of Lulu Kop. They are generally regarded as associated with copper ore, and their existence has long been known, much ground having at one time or another been pegged off, more with a view to future possibilities than as a result of thorough investigation. Attention was again directed to this district during 1911, in consequence of mining operations carried out four miles north of Lulu Kop at the Guide Copper Mine, since closed down. The general characters of the Palabora district have been alluded to in Chapter I. and elsewhere. The surface relief, apart from isolated and prominent landmarks of masses of syenite, is somewhat monotonous and fairly level, everywhere densely covered with vegetation. During 1911 the district was made more easily accessible by several well-designed roads. Water is very scarce away from the Selati and Olifants Rivers, but this drawback is being overcome by boreholes, which provide a welcome supply of good water adequate for the requirements of the traveller and prospector. The workings of the Guide Copper Mine are situated about four miles north of Lulu Kop and one mile west of a conspicuous elongated ridge, known as Skoteen, on the highest point of which lies the NGII beacon. From Leydsdorp the distance is some thirty-five miles, nearly due east. The prominent kops surrounding the mine—such as Kitchener's Kop, Mapodse, Mapoidene and Skoteen—are due to rugged masses of ball-shaped medium to coarse grained granite and syenite, while the intervening lower-lying slopes or more level flats show occasional outcrops of syenite, varied by smaller ill-defined areas of genetically associated pyroxenite. As more fully explained in Chapter VI., the whole district consists of a Plutonic Complex mainly of intermediate and basic rocks, ranging from pure augite syenite through transitional mere basic phases to pyroxenites and traversed by pyroxene orthoclase or orthoclase pegmatites, representing the latest phase in the process of consolidation. While magmatic differentiation has commonly resulted in a definite separation of more normal light greyish-pink syenite on the one hand and deep green basic pyroxenite on the other, one finds irregular and smaller patches of incompletely differentiated parent magma, which consolidated as coarsely crystalline rocks mainly composed of pyroxene and orthoclase. The workings of the Guide Copper Mine are in such an intermediate zone associated with copper-bearing orthoclase pegmatites close to some ancient workings. The country rock is well exposed in Shaft C and has been described in Chapter VI. At the time of the writer's visit this shaft was some 120 feet down, and showed an evenly medium or coarse grained deep green pyroxenite, rich in idiomorphic columnar crystals of pyroxene enclosed in large optically continuous orthoclase with relationships resembling poikilitic structure; exceptionally one finds larger patches of black mica. The pyroxenite is frequently traversed by veins of coarse pinkish orthoclase which cut sharply across the parent rock. It is in these later pegmatites that the copper is more commonly met with. The ore is distributed in zones of impregnated rock and scattered irregularly through the pegmatites in specks, streaks, or large irregular patches. Sometimes such a zone consists of about one foot of richly impregnated rock, alternating with or passing into another zone several feet thick of less mineralised rock. In certain very beautiful phases the pink pegmatite contains large phenocrysts of orthoclase one and a half inches across, outlined by fresh delicate veins of wider crystalline masses of bright yellow copper pyrites associated with deep greenish-blue peacock ore, now and then forming a kind of network. Near the surface malachite and azurite were found, at a depth of twenty feet bornite and glance come in, lower down chalcopyrite, though bornite still predominates. Very little chalcopyrite was found at the top. Some crystals show a central portion of brass-yellow copper pyrites surrounded by bright steel blue peacock ore. The general conditions suggest that the ore forms irregular zones of impregnation genetically connected with the intrusion of orthoclase pegmatite, which probably represents the ore carrier. No satisfactory indications of a defined lode are seen. For these reasons the distribution of the ore is uncertain, and mining difficult in consequence. *Ancient workings* are numerous throughout the Palabora district south of the above-mentioned deposits. They occur at many localities round Lulu Kop and also within the pyroxenite flats between Lulu Kop and April Kop: several old pits can be seen a few yards north of the road to Malelane a little east of April Kop, where deep green pyroxenite is exposed carrying specks or streaks of malachite. The most abundant workings lie near the summit of Lulu Kop, and specially all over the southern slopes. This locality is exceptionally interesting, both from the geological and the ethnographical or archaeological point of view. It was shown above that the higher portions and the summit of Lulu Kop consist of white or greyish crystalline metamorphic limestone, probably assignable to the ancient formations of the Murchison Range Series, and characterised mineralogically by fresh calcite, magnetite, apatite, and locally mica sometimes in very coarse pegmatitic association. Surrounding the kop, more specially on the south side, is an extensive area of green pyroxenite. As one approaches Lulu Kop from the south, magnetite appears in drifted fragments, which increase in abundance and become intermingled with limestone debris as the ground rises towards the higher slopes. The ancient workings on Lulu Kop are obviously of two distinct types, conveniently referred to as "pot-holes" and "reef workings." All over the slopes and even near the summit pot-holes are extremely abundant, and it is no exaggeration to say that the slopes are riddled with them. They are nearly all very much overgrown, and hence sometimes difficult to examine. Adjoining pot-holes are frequently only a few yards apart; some are still about twenty feet deep and forty feet or more wide at the top, with remnants of the old ore dumps alongside, though the latter in course of time have no doubt been reduced by weathering, etc. No definite features can be traced in the distribution of the pot-holes, but they are specially abundant near the centre of the ridge on its south side. The vast majority are irregular shallow pits, often only a few feet in depth, but this may be due to subsequent gradual falling in of the sides. In going over these extensive old workings, one is struck with the very few and small occurrences of copper indications. The excavations seem to have been carried out in a very crude and primitive manner, and were perhaps determined merely by following irregular patches of copper ore or possibly of magnetite. An examination of the ancient ore dumps suggests that the copper-bearing rocks were very thoroughly eliminated from the barren country rock, as one rarely sees any ore left in them.

The second class of ancient workings—so-called "reef workings"—are totally distinct from the above-described "pot-holes." The former occur lower down over the south-eastern slopes of the kop, and consist of a series of very well-defined parallel trench-like workings, running approximately from north to south and separated from one another by only a few yards. The greatest depth does not exceed fifteen feet, with an average width of between two and three feet. The most remarkable feature is the very regular method of mining, well-defined pillars, presumably of reef matter, having been left supporting the hanging and foot walls, which dip at a high angle towards the west. Whatever may be the archaelogical significance of the pot-holes, there can be no doubt that these very regular reef workings are not the work of tribes indigenous to South Africa, but due to a more civilized race. The material, of which the pillars are composed, is essentially a calcareous rock, probably derived from the metamorphism of a formation analogous to the Lulu Kop Limestone. No signs of copper were found either in the pillars or in the rocks occurring near it. The bulk analysis of the pillar, made by Dr. Moir, Chemist to the Mines Department, is as follows:—Hygroscopic Moisture, 0.31 per cent.; Insoluble Silica, 3.25 per cent.; Metallic Iron, 15.25 per cent.; Metallic Copper, 1.52 per cent.; P_2O_5, 1 per cent.; Ca O, 31.50 per cent.; Sr O, 2.70 per cent.; Mg O, 3.40 per cent; Sulphur and Sulphate, about 0.25 per cent.; Loss on Ignition (CO_2), 32 per cent.; Oxygen (by difference), 5.82 per cent.—Total, 100 per cent.

Insignificant traces of tin, potassium, and yttrium (?) were also found. Commenting on the above analysis, Dr. Moir says: "The iron is mostly magnetite with a little spathic ore. The copper is malachite. Strontium is present apparently as celestine. The main bulk is calcite. In modern days the mixture might figure as a poor but easily recovered copper-ore, or as a combination of iron-ore and flux, or as a tenth-rate phosphatic manure." The above evidence unfortunately throws little light on the question as to what mineral or ore was being mined in these reef workings.

Reference may here be made to the widespread occurrence of magnetite (and apatite) in the Lulu Kop limestone; it was also pointed out above that, owing to the prolonged exposure and removal of the more easily soluble calcareous portion, a marked concentration of this ore has resulted. Its source must be sought for in the pyroxenite which contains magnetite and was the agent of metamorphism. As several other localities throughout the world, e.g., in the Christiana District, the Isle of Elba, Hungary (Banat), the United States, and elsewhere, magnetite is the commonest contact ore-deposit associated with metamorphosed limestones. Along the southern slopes of Lulu Kop near the probable position of the junction between the limestone and the pyroxenite, abnormal and extremely coarse pegmatitic bands, rich in large magnetite crystals and coarse brownish mica, embedded in a calcareous matrix, were observed, sometimes showing large masses of green apatite. They are, for instance, well seen in the more northerly portion of the reef workings, where they enter into the composition of the walls supported by a large pillar. It is highly probable that they are genetically connected with the intrusion of the pyroxenite magma, which also probably was the source of the apatite. An analysis of the magnetite, carried out in the Laboratory of the Mines Department, gave the following results:—Iron, 62.10 per cent.; Si O_2, 1.65 per cent.; Al_2O_3, 3.20 per cent.; Ca O and Mg O, 4.60 per cent.; P_3O_5, 1.67 per cent.; Oxygen (by difference), 23.78 per cent.—Total, 100 per cent. Titanium, arsenic, sulphur, CO_2, and moisture were all absent; very slight traces of manganese and chromium were found.

Apart from calcium phosphate, the above analysis points to a good iron ore, and the notable absence of titanium, as compared with the more highly titaniferous magnetite deposits of the Bushveld Complex, is noteworthy, and agrees with the chemical composition of some of the contact ore-deposits of magnetite in the localities referred to above.

(To be continued.)

THE WEEK IN THE SHAREMARKET.

Undecided and Irregular—Some Notable Fluctuations—A Better Tone.

A BETTER tone has characterised the market during the week, but little activity has resulted. The market has furnished the usual crop of idle rumours, some very far from the mark, and as a consequence New Kleinfonteins are down and East Rand Centrals up. Tins are sagging for no known reason, and diamonds are in increased demand. On the whole, most Rand stocks, big and little, stand at an attractive level, and London will, no doubt, discover it one of these days. A holiday spirit pervades the local market, apeing the lucky people oversea, but what Rand brokers have to hold carnival over is their secret. It is to be hoped that even one much-talked-of new diamond discovery will "make good," but the possibilty is far too good to be true. A tin flotation with a capital of £180,000 is hinted at, but nothing definite regarding it is available.

* * * *

From London, we learn by the mail that Rhodesians have shown little more life than Kaffirs. A good deal of interest was taken in the meeting of the Shamva Company, at which it was stated that crushing should begin within a year from now. About £50,000 will be required to complete the plant; but the Chairman anticipates no difficulty in providing this amount. There is a huge tonnage of ore developed, but the grade is exceedingly low, and the question of working costs will prove to be a vital one. Later news from the Giant indicates that somewhat poor stuff is being encountered in the boreholes. Globes, on the other hand, have met with a little support, on the cable to the effect that the lowest level is now in more settled country.

* * * *

	Friday, 19th	Sat., 20th.	Monday, 22nd	Tuesday, 23rd.	Wed., 24th.	Thurs. 25th.
African Farms ...	14 6B	14 9	11 3B	15 0	15 0B	15 0S
Adair-Usher Process	...	1 6S	1 6S	...	...	...
Apex Mines ...	30 6B	30 0	29 0B	...	...	30 0S
Bantjes Consolidated	22 0B	22 3S	21 0B	21 6B	...	21 6B
Benonis	4 9	4 6S	4 9	4 7	4 6B	4 3B
Bushveld Tins ...	1 0B	1 0B	...	1 3S	1 0B	...
Brakpan Mines ...	73 0B	73 0B	73 6B	72 9B	73 0B	73 0B
City and Suburban ...	46 6B	46 9	...	...	47 0B	47 0
City Deeps	56 3B	...	...	...	...	55 6B
Cloverfield Mines ...	5 1B	5 0S	5 0B	5 0B	5 0S	...
Cons. Langlaagtes ...	22 3B	22 6	22 3	22 0B	22 6	22 0B
Cons. Main Reefs ...	19 3	19 3	19 0B	19 0B	19 0B	19 3
Coronation Freeholds	0 5B	0 5B	0 6S	0 6S	...	...
Clydesdales	10 0B	...	10 0B	...	...	11 6S
Crown Mines	130 0B	127 6B	...	...	...	...
Con. Investment ...	18 6B	18 0B	...	...	...	18 0B
Concrete Cons. ...	...	10 0S	...	10 0S	...	...
East Rand Cent. ...	9 3B	9 3B	9 3B	9 0B	9 0B	10 6
East Rand Coals ...	2 4B	2 5	2 1B	2 4B	2 3B	2 3B
East Rand Deeps ...	2 0S	2 3	2 0B	2 0B	...	2 0B
East Rand Props. ...	56 6B	56 0	56 0B	56 3B	56 0B	56 6S
East Rand Deb. ...	£92½	£92½	£92	£92½	£92½	...
Eastern Gold Mines	1 9B	1 9B	1 9B	1 9B	...	1 9B
Frank Smith Diam...	8 3B	8 6B	8 6B	8 9B	8 9B	9 0B
French Rands ...	1 0B	1 0B	...	1 0B	1 0B	1 0B
Govt. Areas... ...	23 0	22 9	22 6B	22 9B	23 0	23 0
Glynn's Lydenburgs	27 0B	29 0S	...	27 0B	27 0	27 0B
Ginsbergs	27 9B	27 0B	27 0B	27 0B	27 0B	27 0B
Glencairns	5 0S	4 0B	...	4 0B	5 0S	4 0B
Glencoe (Natal) Colls	5 9B	6 0B	5 9B	5 9S	5 9B	5 9B
Geduld Props. ...	21 0B	...	...	21 0B	22 0S	...
Hex Rivers	0 3B	0 3B	0 3B	0 3B	0 4B	0 4B
Jumpers	...	...	...	5 0B	...	...
Jupiters	10 6B	10 6S	10 6S	10 6B	10 6B	10 6S
Kaalfontein Diamonds	0 4B	0 5B	...	0 4B	0 4	0 4B
Klerksdorp Props. ...	3 0B	...	3 0B	...	2 9B	2 9B
Knight Centrals ...	13 3B	13 3B	13 3S	13 3	13 3	13 3B
Luipaardsvlei Estates	7 6B	7 6S	7 6B	7 9	7 9B	7 9B
Lace Props.	3 6	3 4B	3 4B	3 4B	3 3B	3 4B

B Buyers. S Sellers.

	Friday, 19th	Sat., 20th	Monday, 22nd.	Tuesday, 23rd	Wed., 24th.	Thurs. 25th.
Lydenburg Gold Farms	2 1B	2 1B	2 1B	2 3	2 3	2 2B
Main Reef Wests ...	25 3B	25 3B	25 3B	25 6	25 3B	25 0B
Modder B's	58 0B	57 6B	59 0S	59 0S	58 9B	58 6S
Midas Deeps ...	0 3B	0 3B	0 3B	0 3B	0 4B	0 4B
Middelvlei Estates...	1 3B	1 3B	1 4B	1 4B	1 5B	1 6
Modder Deeps ...	28 9B	28 6B	...	28 9B	28 0B	28 6B
New Eras	7 3	7 0S	6 9S	7 0B	7 0B	7 0B
New Kleinfonteins ...	27 6B	27 6S	28 6S	26 0B	26 0B	26 0
New Rietfonteins ...	7 9B	...	8 0S	8 0S	...	...
New Unifieds ...	17 0B	16 9B	...	17 6S	17 6S	17 6S
New Boksburgs ...	2 0S	1 3B	1 3B	1 6B	1 3B	...
Orange Diamonds ...	1 6B	1 9S	1 4B	1 4B	1 4B	1 3B
Pigg's Peaks ..	...	11 6B	...	11 6B	11 6B	11 6B
Pretoria Cement Co.	51 6B	50 0B	50 0B	50 0B	50 0B	59 0B
Pretoria Estates ...	...	...	17 6S	...	...	...
Paardekraal Estates	...	0 6B	...	...	...	...
Princess	9 6B	9 6B	9 6B	9 6B	9 6S	9 6B
Rand Nucleus ...	2 9B	2 9B	2 9B	2 9	2 9B	2 9B
Randfontein Estates	26 9	26 3B	26 3	26 3B	26 3B	26 0B
Randfontein Deeps...	...	4 0B	4 0B	4 0B	4 0B	4 0B
Rooiberg Minerals ...	31 9	31 9S	30 9	30 0B	30 3B	29 6B
Rand Klips	4 6	4 6B	4 9	4 7B	4 10B	4 8B
Ryan Nigels ...	3 9B	3 9B	3 9B	3 9B	...	...
Robinson Deeps ...	46 3	...	...	...	...	...
Simmer Deeps ...	3 0B	3 0S	...	3 0B	3 0B	3 0B
South African Lands	4 0B	4 0B	4 0	4 0B	4 0B	4 0B
S. Randfontein Deeps	3 3B	3 6S	3 3B	3 3B	3 3B	3 3B
Sub Nigels	5 0B	5 0B	5 0B	5 0B	5 0B	5 3B
Springs Mines ...	...	15 6S	15 6S	15 0S	15 0S	15 0S
S. A. Breweries ...	38 0B	38 0B	38 0B	38 0B	38 6B	38 6B
Trans. G.M. Estates	...	...	...	...	15 0B	...
Temple Tins	4 0B	4 0S	4 6B	4 7	5 1	5 0
Trans. Coal Trusts...	42 9S	...	42 6B	42 6B	42 0B	43 0
Tudors	...	...	2 0S	1 0B	2 0S	...
Van Ryn Deeps ...	17 3S	17 0B	17 0B	17 0	17 0B	...
Village Deeps ...	39 0B	38 9B	...	40 6S	...	...
Vogel. Cons. Deeps...	0 9B	0 8B	0 9B	0 9B	0 9B	1 0S
Voorspoed Diamonds	8 0B	10 0S	10 0S	8 0B	8 3B	9 3B
Van Dyks	2 0B	...	...	...	...	...
Witwatersrands ...	52 0B	52 6B	53 0B	53 0B	52 6B	52 6B
Wolhuters	20 9B	20 6B	20 3B	20 6B	20 9B	20 6B
Witbank Collieries...	41 6S	45 0B	...	44 0B	...	42 0B
Wit. Deeps	...	...	45 3B	45 0B	...	...
West Rand Est. ...	2 6B	...	...	...	2 6B	...
Zaaiplaats	40 6B	40 3	39 0	40 0	39 6B	38 0

B Buyers. S Sellers.

Contracts Open.

The Municipal Council of Johannesburg invites tenders for the supply of sanitary pails and lids (August 2nd), licence plates and badges (2nd August).

The Chairman of the Union Tender Board, Box 371, Pretoria, invites tenders for the supply, delivery, and fixing in position where necessary, certain show cases, furniture and fittings, to the Public Museum at Bloemfontein (July 31).

The Corporation of Pietermaritzburg invites tenders for the supply of one steam turbine with tandem generators, switchboard, and condensing plant (July 29).

In Liquidation.

Transvaal Mines Labour Co., Ltd., Johannesburg, voluntary.
Ferreira Gold Mining Co., Johannesburg, voluntary.
All Red, Johannesburg, voluntary.
Thomas and Morris, Ltd., Johannesburg, voluntary.
Jefferson, Ltd., Johannesburg, by order of the Court.
West Rand Unified, Ltd., Johannesburg, voluntary.
New Orion Mynpacht Gold Mining Syndicate, Ltd., Johannesburg, voluntary.
Buxtons', Ltd., Pretoria, by order of the Court.
Seta Diamonds, Ltd., Johannesburg, voluntary.

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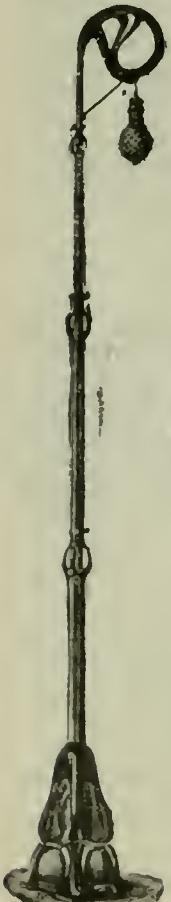

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Electrical Notes.

ELECTRIC POWER FOR CAPETOWN SUBURBS AND RAILWAY.

Big Municipal Scheme—Transmission to the Suburbs.

Some four months ago arrangements were made between the Capetown City Council and the Municipalities of Mowbray, Claremont and Rondebosch, whereby the former, by purchasing the Cape Peninsula Lighting Company's undertaking, were able to considerably enlarge the supply area of the city's municipal electrical system, which now extends from the far end of Sea Point to the boundary of Claremont and Wynberg. With a view to economy in generation, it was decided to shut down the generating station at Claremont at the earliest possible date; and with this end in view considerable extensions to the plant at the Dock Road Power Station are now in progress.

The load which may be expected at the power station within the next six months will have reached the point at which it is generally recognised the steam turbine is a more efficient prime mover than the reciprocating steam engine. The Capetown Corporation have, therefore, made arrangements for the installation of a 2,000 kilowatt dynamo driven by a steam turbine. This turbine plant, which is the first of any size to be installed in the Peninsula, will be sufficient to meet the whole of the demand in the Peninsula from Sea Point to Wynberg, and will be in operation daily from about 8 a.m. to 12 midnight, the present reciprocating engines only being used during the early hours of the morning and on Sundays, when the load is not sufficient to run the turbine efficiently. The present plant will also be kept in reserve as a stand-by in the event of failure of the turbine.

The energy in Sea Point is alternating current as distinct from the direct current supply in the city area; alternating current lending itself better to the transmission of energy at some distance from the power station, in addition to being more efficiently distributed over a straggling residential area where little energy is required for power purposes. For these reasons the supply in the southern suburbs, which is at present direct current, will be changed over to alternating so soon as the generation is undertaken from Dock Road. The generating plant is being further augmented by the installation of an additional boiler of 1,000 h.p. capacity, and a Green's patent fuel economiser.

Transmission.

The supply of energy to the suburbs from Dock Road Power Station naturally necessitates the employment of high-tension current, and with a view to economy in copper 11,000 volts has been adopted as the pressure at which the necessary power will be transmitted. A sub-station is now being constructed at the power station, which will accommodate the necessary transformers and switchgear. The plant in this sub-station will transform energy from 2,200 volts (the pressure now in use for Sea Point and a portion of the Government bulk supply), to 11,000 volts; and from the sub-station cables in duplicate will be laid as far as Claremont. These cables will enter sub-stations at Mowbray, Rondebosch and Claremont, where the 11,000 volts will be reduced to 220 volts, at which pressure energy will be distributed through the various streets for public lighting and the supply to private consumers of light and power. In addition to the supply to the sub-stations referred to above, these cables will also supply energy via the railway sub-station in Castle Street to Messrs. D. Mills & Co.'s mill, Castle Bridge, with whom the Council have made an agreement for bulk supply; the suburban waterworks at Rondebosch, where electrically-driven pumps are replacing the existing suction gas plant. And at the moment negotiations are in progress with a view to the supply of energy for the electrification of Salt River Works, which, if carried through, will necessitate a further sub-station at Salt River.

In connection with these three consumers it is interesting to note that their consumption is estimated at 2,250,000 units per annum. This fact may not convey much to the non-technical reader, but some idea of what it represents will be gained when it is remembered that the much-discussed contract which the Council entered into with the late Cape Government about four years ago for the supply of electric current at the docks and railways represented an annual output of one and a quarter million units. It is also interesting to note that the above 2,250,000 units, which it is expected will be taken by three consumers, is approximately five times the total number of units sold by the Cape Peninsula Lighting Company in 1911, and it is only by the extension of its area of supply into the southern suburbs that the City Council's electrical undertaking was able to offer an acceptable figure per unit to, at any rate, two of these consumers.

The sub-station equipment in the suburbs will comprise somewhat similar gear to that in the Dock Road Sub-station. The change-over alternating current in the suburbs necessitates the replacement of all the existing continuous current meters on consumers' premises. A portion of the cable is now on the water, and so soon as sufficient arrives cable laying will be commenced with a view to connecting up the first large consumer, namely, the Suburban Waterworks. The pumps for this work, which are also being provided by the City Council, are expected in Capetown within the next few weeks. The existing suction gas plant will be retained for use in the unlikely event of a breakdown, as naturally, where the pumping of water for domestic consumption is concerned, the authorities cannot afford to run any risks, however remote the latter may be. The balance of the plant referred to will come forward within the next three months, with the exception of the turbine, which will not be installed and in running order until the middle of February.

The machinery, etc., mentioned, the cost of which will be between £20,000 and £30,000, is of the best type obtainable. The selection of the plant has been made by Mr. W. F. Long, M.I.E.E., City Electrical Engineer, who has recently returned from a special visit to Great Britain for this purpose. The largely-increased output from the Dock Road Power Station, together with the saving in steam consumption due to the introduction of a turbine, is expected to reduce very considerably the cost of production; and this, coupled with the fact that an all-round reduction in costs must necessarily follow so large an increase in the area of supply, would point to a further reduction in the Cape Council's tariff for electric supply in the near future.

The Public Works Department, Pretoria, has accepted the following tenders :—Dunbar and Co., Box 5978, Johannesburg, £2,341; erection of school at Fountainbleau, near Johannesburg. Jas. Lillico, Box 2200, Johannesburg, £1,073 16s. 3d.; alterations and additions to City and Suburban School, Johannesburg. Harper Bros., Box 6393, Johannesburg, £1,890; alterations and additions to Bezuidenhout Valley School. W. and R. Johnstone, Bethal, Transvaal, £1,300; erection of school and quarters at Welbedacht No. 40, Standerton, Transvaal. R. Forbes and Co., Box 5188, Johannesburg, £7,299; additions to Boksburg North School, Transvaal. Campebll and Watson, Box 141, Pietersburg, Transvaal, £1,993; erection of school and teachers' quarters at Wakkerstroom No. 790, Zoutpansberg, Transvaal. A. J. Franken, Box 33, Ermelo, Transvaal, £667 10s.; erection of school at Amsterdam, Transvaal. A. J. Franken, Box 33, Ermelo, Transvaal, £1,261 11s.; erection of school and quarters at Athalie, Piet Retief, Transvaal. Innes, Holton and Holton, Eloff Street, Krugersdorp, Transvaal, £1,840 6s. 9d.; erection of school and quarters at Mahemsvlei No. 539, Klerksdorp, Transvaal. Campbell and Watson, Box 141, Pietersburg, Transvaal, £1,396; erection of school and quarters at Rietfontein No. 288, Waterberg, Transvaal.

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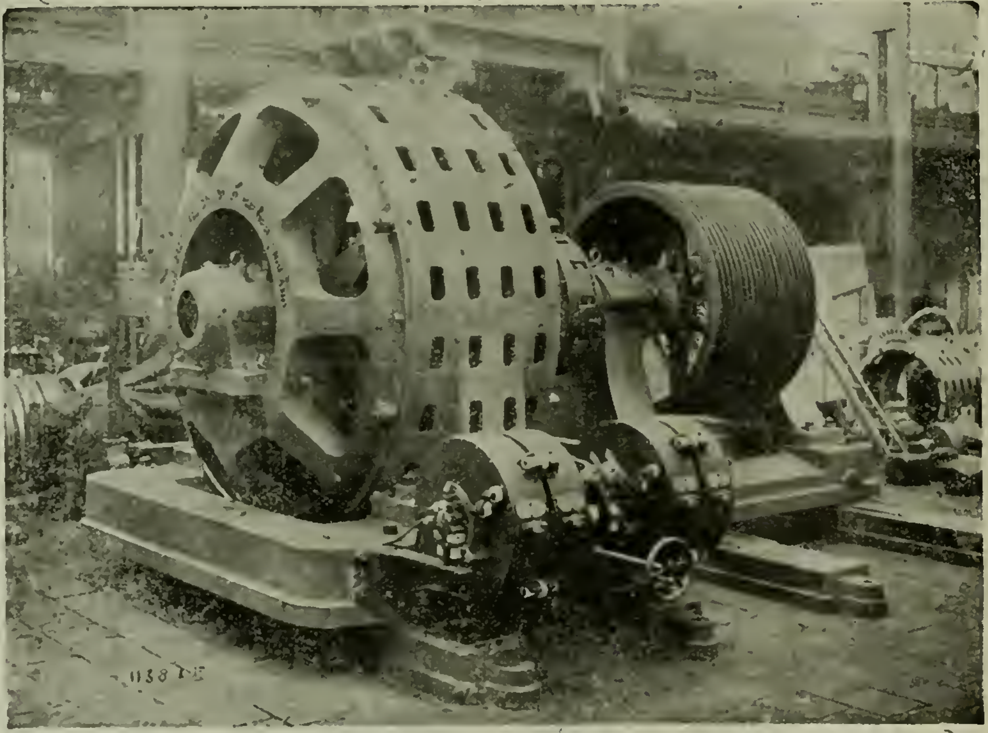

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Engineering Notes and News.

A Municipal Contract.

Frankfort (O.F.S.) Municipality have just given out an important lighting contract, and have succeeded in pleasing everybody by consulting solely the interests of economy. Messrs. A. Koppel and Co., Ltd., are the successful tenderers.

Ozonair Portable Apparatus,

We have received from Messrs. Ozonair, Ltd., 96 Victoria Street, Westminster, London, S.W., a copy of the new edition of their catalogue No. 1 "Ozonair Apparatus for General Purposes." This catalogue contains illustrations prices and other particulars of ozonair portable generators for purifying the air in rooms of from 3,000 to 12,000 cubic feet capacity, for connecting the supply circuits or to portable accumulators. These apparatus are made in a variety of patterns, for standing on the table (horizontal or vertical current of ozonised air); for fixing on the wall; with medical fittings, etc. They are of handsome and compact design, and the consumption varies from only 10 watts to 130 watts, so that in all cases, where intended for use on a supply circuit, they can be connected to any lamp-holder or plug. The makers claim that their ozonair apparatus, as compared with other methods of producing ozone, are noiseless and generate pure ozone free from the oxides of nitrogen. The catalogue also contains some very interesting information regarding the nature of ozone and the many public and industrial purposes to which ozonair apparatus can be applied, such as ventilation, water and food sterilising, brewing, bleaching, deodorising, etc. That these are not hypothetical is proved by a list of important users, not only in Great Britain, but on the Continent, and in other parts of the world, comprising public buildings, breweries, slaughter houses, cold storage, waterworks, laboratories and so on. We understand that Messrs. Ozonair, Ltd., will be pleased to send a copy of the catalogue to all those who are interested in the subject.

Beira to Katanga: New Railway Suggested.

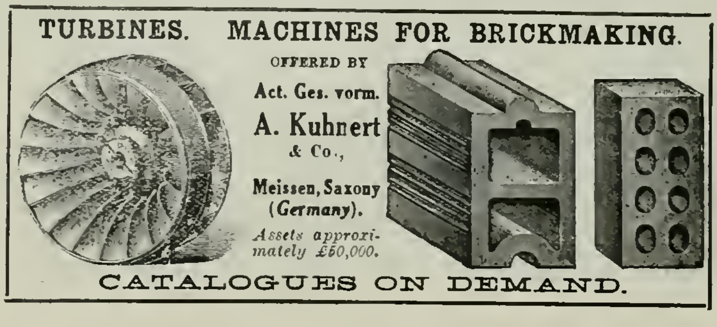
H.M. Vice-Consul in the Katanga (Mr. G. Campbell), in his report on the trade of that district in 1911, states: "The construction of a line between Salisbury and Broken Hill would be of great advantage to the Katanga. The line between Elisabethville and Kambove is being constructed as fast as the rains and the shortage of labour will allow, and it is hoped to reach Kambove in October. The construction of the line between Kambove and Bukama, a distance of 320 kilometres (200 miles) will probably be undertaken in 1913, and on its completion there will be through connection between Capetown and Boma by rail and water. A steamer is now plying on the River Lualaba, between Bukama and Kongolo, whence a line runs to Kindu, and a further line is to be constructed to Lake Tanganyika along the Lukuga Valley. Away from the railway the question of transport is extremely serious, and between Elisabethville and Pweto, on Lake Moero, or Kikondja, on Lake Kisale, porters and food are difficult to obtain. Recourse must be had to contractors, who charge from 3s. to 4s. per diem per porter, and about 2s. per diem for the return journey, without loads. Further porters must be engaged to carry food for the original caravan, with the result that the journey to Kikondja, which occupies twenty-five days, works out at from £9 to £10 per load. The Government are attempting to remedy this unfortunate state of affairs in conjunction with a labour bureau, which was formed some time ago. It is stated, however, on good authority, that porters will soon be obtained at a cheaper rate. In the north-east of the district, in the Tanganyika zone, porters are paid 1s. 2d. per diem, and in the Lomami zone, in the north-west, 10d. per diem."

Shire Highlands Railway.

In Committee of Supply of the House of Commons, recently, the Colonial Secretary (Mr. Harcourt) said that in Nyasaland there was a new chapter opening in railway construction. There was now only a short piece of line from the headquarters of Government at Blantyre down to Port Herald on the Shiré River. The Shiré River had a very shallow bed and a very variable stream; the water portage of goods down that river to the Zambesi, and so to the sea, had, therefore, been very uncertain and unsatisfactory. He, therefore, last winter had entered on some complicated negotiations, now happily completed, by which the Imperial Government had made a loan of £180,000 to the Protectorate to repurchase the subsidy lands originally granted to the Shiré Highlands Railways, and at the same time the Protectorate Government were giving a guarantee of interest at 4 per cent. on £500,000 to the existing railway for its extension. The railway, instead of stopping, as now, at the almost un-navigable Shiré River, would be taken direct to the Zambesi, and south of the Zambesi again by another company down to the port of Beira. It was contemplated that the Zambesi would ultimately be bridged to join the two lines, and he had hopes that the work might be taken in hand before the completion of the railway, but even if left to the future it was not essential to the great and immediate benefits which would be conferred. He hoped also in the not distant future that the railway system would be extended northwards up to the south end of Lake Nyasa itself.

New Patents.

336. James Arthur Little.—Improvements in and relating to stem guides.
337. Fritz Ebener.—Lattice work with longitudinal ribs and connecting ties formed from sheets or section metal bars or bands by opening cuts or slits and process for manufacturing such as lattice work.
338. Herman Clarke and James Alexander Campbell.—Improvements relating to fuel.
339. Otto Stuhang Tonneson.—Improved stand for rock drills.
304. William Gilbert Leigh.—Water spray for laying dust underground.
341. Charles Washington Merrill.—Improvements in classifiers.
342. John Kenneth Addie.—Improvements in detecting mis-fired blasting cartridges.
343. William Calder.—Improvements in means for discharging comminuted matter from tube mills.
344. Henry Simpson.—Water and fireproof composition paint.
345. Hugh M. Robb.—Spring shaker
346. Gustav Jebsen Christian.—Process for separating solid substance from solutions by evaporation.
347. Guy Aubrey Chalkley.— Improvements in supporting rock drills.
348. Edwin Thomas Willoughby.—A new method and means for ganging and distributing point cut brass rule and leads.
349. Herman Brenscheidt.—A combined copying damper and drying pad.
350. Charles Oscar Anderson.— Automatic Slack adjuster.
351 Demetrio Maggiora.—Improvements in solid tyres for vehicles and the like.
352. Maurex Magnetic Co., Ltd., and Alfred Arthur Lockwood.—Improvements in or relating to the treatment of ores and their apparatus therefor.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Finance, Commerce, and Industries.

Railway Rates Reduction.

Speaking at a meeting of the Klerksdorp Chamber of Commerce last week, Mr. J. A. Neser, M.L.A., referred to the question of railway rates reductions. He pointed out that it had been resolved that reductions amounting to £750,000 should be effected chiefly in coal rates and in removing anomalies in through traffic rates. As to anomalies, he instanced the cases of Klerksdorp and Beaufort West, very nearly equal in distance from their respective ports, and yet the rates to Klerksdorp were one-third more than to Beaufort West. It was hoped, however, when their Portuguese friends had assented, to bring the rates on various articles of merchandise down to an equivalent of the rates in force in the Cape. Next year further reductions still would be required, and the fight would have to be maintained till they might have a change in the views of the Government, and so get justice for the inland centres. In alluding to new railway construction proposals, he said there was very little doubt that the next programme to be introduced would include the Vierfontein-Kroonstad line.

* * * *

Ostrich Feather Industry.

The Union Trades Commissioner in London, whose annual report has just been published as a blue-book, deals at considerable length with the staple and other exports of the Union, their vicissitudes in 1911 and in previous years, and the prospects of development. First, he places the ostrich feather trade, which is important not only by reason of its actual bulk, but because of the exceptional position which South Africa holds in the world's markets in regard to this particular article of commerce. "So successful have the South African ostrich feather breeders been, that they have established for themselves a world's monopoly, and their competitors are few and insignificant." South Africa, Mr. Chiappini goes on to say, supplies the world's markets with about 85 per cent. of their total requirements, and produces "by far the highest types of feathers in the world." As regards the future the Trades Commissioner is optimistic. While recognising the gravity of the danger of over-production, he points out that any artificial restriction of supply by the South African breeders would be entirely in favour of their competitors, at present "few and insignificant," in other parts of the world. At present the industry in North Africa is unprogressive, and during the last year has been particularly bad owing to the war in Tripoli and the unsettled state of Morocco. In Madagascar "ostrich breeding is not progressing satisfactorily." and in the United States, where determined efforts are being made to acclimatise the industry, there were, according to the latest official figures (April, 1910), only 29 ostrich farms with 5,361 birds. Apparently, however, Mr. Chiappini founds his optimism chiefly on the consideration that "the mere fact of South Africa being able to produce more feathers than the market requires, is a guarantee that she will be able to maintain the monopoly of this trade."

* * * *

Wool, Maize, and Fruit Industries.

In regard to wool the Union Trades Commissioner in London, in his annual report, is not optimistic. South African wool is well established in the world's markets, but it has more competitors, and the South African climate "compares unfavourably with that of the best wool-growing districts of Australia." Mr. Chiappini points out that, in spite of great improvements by some shippers, "South African wool is still conspicuous in the warehouses for the untidy appearance of the tares, which are generally of a coarse, inferior material, badly cut, and roughly sewn-up at previous sales, and in a dirty grimy condition: this is in contrast with the neat, well-pressed bales from Australia." Similar observations occur in the chapter of the report which is devoted to maize, in regard to which, however, the Commissioner is generally inclined to be optimistic. He mentions several markets on the Continent in which South African maize is making good headway, and apparently considers that there is room for a largely increased supply. In dealing with the wattle bark trade, he has occasion to remark that "in a few instances dealers complain of the want of knowledge of some shippers in grading, want of care in protecting the bark from rain and weather previous to shipment, with the result that some of the bark arrived in a wet and deteriorated condition." He suggests the establishment of factories for producing in South Africa the extracts which are now generally used in place of the bark itself. Regarding the development of the fruit export trade, the report brings into prominence the effort which is being made by the Commissioner to develop the trade in oranges, which differs in several respects from other departments of the fresh fruit industry, for export. The orange arrives in England at a different time of year from the bulk of South African fruit, it does not need to be carried in cold storage, and, above all, it is a great article of commerce, "the fruit of the millions," whereas the bulk of the fresh fruit from the Cape is a luxury when it arrives, fetching a high price, and commanding only a limited market. One other statement in regard to the exportation of fresh fruit may be noted as a matter for congratulation: "The season of 1912 is a remarkable one, and will show a further increase of about 45 per cent. in the quantity exported."

* * * *

Consul Maugham's Report on Delagoa Bay.

The Consular report of Mr. R. C. F. Maugham on the trade of the Portuguese possessions in East Africa for the year 1911 is of a satisfactory character. The imports for local consumption in Lourenco Marques during 1911 showed an increase over those for the previous year of £142,093, the totals being £699,327 for 1910 and £841,420 for 1911. The "trade movement" in 1910 was of the value of £8,184,041, while last year it was only £7,052,994—a difference of £1,131,047, or equal to a fall of 16·8 per cent. Lourenco Marques appears to be standing still. Last year the town of Lourenco Marques only increased its exports, "the products of the Province," by £2,702 over 1910. Mr. Maugham states that "confidence is freely expressed" in the "brighter outlook now apparent chiefly due to agricultural and other development." The Colony as a whole, and therefore the Treasury, will undoubtedly benefit from the development of the sugar and other industries that are at last being permitted to make headway in certain parts of the Province. Mr. Maugham's conclusions are most reassuring respecting the growing importance of the sugar industry of the Province, of the relative importance of the cocoa-nut plantations, and of the other aids, such as oils from the seeds of native trees, to the industrial development of Mozambique that are in process of exploitation.

* * * *

Coal Bunkering Business.

A strong company is in course of formation at Capetown to deal with the coal bunkering business and general coal supplies. The new company, the paper says, will absorb several of the existing Capetown agencies and will control trade locally. As far as can be learned no shares in the new amalgamation will be offered to the public, and the bulk of the stock will be held by the Union-Castle Company, the balance being divided between three other coal agencies. The paper adds that it is stated that the board of directors will comprise one representative from each of the three agencies absorbed, and three from the large shipping combine, with a casting vote from a chairman chosen from the latter trio. It is stated that Sir Owen Philipps has approved of this combine, but nothing definite, says the *Argus*, will be decided until documentary matter connected with the concern has been submitted to the chairman of the Elder-Dempster line. Working operations of the new company will commence as from the beginning of next year.

Union Estimates. The total of the Union Estimates of Expenditure for 1912-13 is £17,129,851. The total of the Estimates for 1911-12 was £16,890,281. The increase is, therefore, £239,570. The total number of the establishment included in the Estimates for 1912-13 is 20,859. To this figure must be added the number of natives, Indians, part-time officers and others who are not now shown in the numerical column, and who total 6,805 The total establishment included in the Estimates for 1911-12 was 26,538; to this figure, also, must be added certain postal, telegraph, telephone and other officers who were omitted therefrom but are included in the 1912-13 figures, totalling 1,711. The decrease is, therefore, 585. In the following abstract and throughout the detailed Estimates comparison is made with the grants for the service of the year 1911-12, but before indicating, briefly, the variations between the figures for the two years the following comparison is given between the numbers of establishments at the date of Union and those provided for in the Estimates for 1912-13. The establishment at the date of Union, *vide* Estimates for 1910-11, numbered 24,975; to which must be added certain officers (who were not shown in the numerical column at that time owing to the classification then observed) numbering 2,636; giving a total of 27,611. The numbers provided for in the Estimates for 1912-13, *vide* paragraph 2 hereof, is 27,664. The increase is, therefore, 53. This increase is principally due to the fact that the 1912-13 Estimates provide for additions to the establishment of the police force of approximately 460 Europeans, in the department of posts, telegraphs and telephones of 350, in asylum staffs of 167 and in the printing and stationery department staff of 155 artisans. The Estimates for 1912-13 reflect the alterations in the grouping of Votes occasioned by the changes in ministerial portfolios recently announced. The Estimates also give effect to the scheme of grading of officers which it is proposed to apply to the whole service. The main decreases in expenditure, as compared with the Estimates for 1911-12 are as follows:—Vote No. 6—Agriculture, £237,519; Vote No. 9—Interior, £92,954; Vote No. 15—Superior Courts, £27,936; Vote No. 19—Prisons and Reformatories, £25,687; Vote No. 24—Audit, £11,459; Vote No. 26—Public Debt, £32,989; Vote No. 37—Customs and Excise, £13,089; Vote No. 38—Public Works Department, £16,277. The following are the main increases:—Vote No. 12—Printing and Stationery, £45,000; Vote No. 13—Defence, £100,000; Vote No. 18—Police, £94,973; Vote No. 20—Mines, £70,372; Vote No. 26—Public Debt, £107 011; Vote No. 27—Pensions, £42,609; Vote No. 28—Provincial Administrations, £106,767; Vote No. 40—Posts, Telegraphs and Telephones, £51,017. Vote No. 20—Mines—shows a decrease of 66 officers and an increase of £70,372. This number is made up of 75 natives now omitted from the numerical column of the Estimates and 1 Chief Inspector of Mines, less 4 Assistant Inspectors of Mines, 1 clerk, 1 draughtsman and 1 messenger additional and 3 Miners' School staff employed but not included in the 1911-12 numbers. The increase in expenditure is principally due to the grant of £100,00 to the Miners' Phthisis Compensation Fund.

New Companies.

Dunswart Brick Co., Ltd., Orr's Buildings, Benoni, Transvaal; registered June 13; capital, £2,000.

African Laundries, Ltd., 107, Fourth Street, Booysens Reserve, Johannesburg; registered June 5; capital, £400.

Fortuna Diamonds, Ltd., Consolidated Buildings, Fox Street, Johannesburg; registered June 14; capital, £9,000.

Pretoria Premier Gold Mine, Ltd., Cullinan Buildings, Main Street, Johannesburg; registered June 5; capital, £15,000.

Hoare's Motor Supplies, Ltd., 16 Marshall Street, Johannesburg; registered June 14; capital, £3,000.

Norcar Gold Mining Co., Ltd., 14 Transvaal Bank Buildings, Fox Street, Johannesburg; registered June 26; capital, £25,000.

Koedoe Pharmacy, Ltd., 213, Pretorius Street, Pretoria; registered June 5; capital, £4,000.

Chudleigh Bros., Ltd., Mount's Bay House, Pritchard Street, Johannesburg; registered June 14; capital, £230,000,

Cigarettes, Ltd., Reserve Investment Buildings, Fox and Rissik Streets, Johannesburg; registered June 5; capital, £1,000.

Brinkmann, Ltd., Erf 165, Prince Street, Bloemhof, Transvaal; registered June 19; capital, £750.

Rietfontein-Van Ryn Extension Syndicate, Ltd., Transvaal Bank Buildings, Fox Street, Johannesburg; registered June 5; capital, £40,000.

Transvaal Property and Investment Co., Ltd., 21, Alexandra Buildings, Church Square, Pretoria; registered June 22; capital, £400,000.

Height and Haddow, Ltd., 51 and 52, Permanent Buildings, Harrison Street, Johannesburg; registered June 28; capital, £3,000.

The Red Cross Pharmacy, Ltd., 2, Geranium Street, La Rochelle, Johannesburg; registered June 6; capital, £300.

The African Illustrated Newspapers Co., Ltd., 158, Market Street, Johannesburg; registered June 24; capital, £800.

G.E.A. Syndicate, Ltd., Consolidated Buildings, Fox Street, Johannesburg; registered June 8; capital, £1,200.

Macdonald and Thorpe, Ltd., 25, Erasmus Buildings, Church Square, Pretoria; registered Jane 25; capital, £750.

Goldfields Wine and Spirit Co., Ltd., Standard Buildings, Commissioner Street, Boksburg; registered June 12; capital, £3,000.

De Wet and Joubert, Ltd., 219, Pretorius Street, Pretoria; registered June 25; capital, £100.

Clapham's Mining Timber Co., Ltd., Mutual Buildings, Harrison and Commissioner Streets, Johannesburg; registered June 12; capital, £100.

The Blue Lime Association, Ltd., Cullinan Buildings, Simmonds Street, Johannesburg; registered June 26; capital, £600.

Tenders Accepted.

The South African Railways have accepted the following tenders: Hardwood logs for flooring blocks, Machine Shop, Pretoria: Messrs. Millars West Australian Hardwoods Co., Ltd., hardwood logs, 4,000 cubic feet at 3s. per cubic foot, £600 (delivered f.o.r., Capetown). George-Oudtshoorn Line—Permanent way material: Messrs. The Bethlehem Steel Co., 3,348 tons of 60 lbs. rails and fastenings, rail-high carbon open hearth, 1,109 tons at £6 7s. per ton, £7,042 3s.; fishplates, high carbon open hearth, 121 tons at £7 19s. 6d. per ton, £964 19s. 6d. (delivered c.i.f., Mossel Bay); rails-high carbon open hearth, 1,936 tons at £6 per ton, £11,616; fishplates, high carbon open hearth, 1,936 tons at £6 per ton, 182 tons at £7 12s. 6d. per ton, £1,387 15s. Houses (two), Hillbrow, Johannesburg: Mr. D. F. Corlett, Johannesburg, £2,226. Winterton-Bergville Line—earthworks, etc.: Contract No. 1, Mr. A. Chisholm, £2,213; No. 2, Mr. A. C. Carey, £3,953 7s. 3d.; No. 3, Messrs. Rudland and Bawden, £4,457 16s. 6d.; No. 4, Messrs. Anderson Bros., £5,658 19s. 11d. Mealies, yellow and white: Mr. H. Morisse, Johannesburg (in bags of 200 lbs.)—4,000 bags at 9s. 6d. per bag (white mealies), £1,900 (delivered at Milling Company's siding); Transvaal Milling Co. (in bags of 200 lbs.), 800 bags yellow mealies at 10s. 5d., £416 13s. 4d.; 600 bags yellow mealies at 10s. 6d., £315; 600 bags yellow mealies at 10s. 7d., £317 10s. (delivered f.o.r., Kazerne); 1,500 bags white mealies at 9s. 10½d., £740 12s. 6d.; 500 bags white mealies at 10s., £250; total, £2,039 15s. 10d. (delivered at Milling Company's siding). Lubricating oils: Messrs. J. and R. Niven, Johannesburg—axle oil to specification, in casks for Capetown, 10,000 imp. galls., at 7⅜d., £307 5s. 10d., in casks for Port Elizabeth, 3,600 imp. galls., at 7⅜d., £110 10s. 6d.; in casks for East London, 4,600 imp. galls. at 7⅜d., £141 7s. 1d.; In casks for Durban, 29,000 imp. galls., at 7⅜d., £891 2s. 11d.; in cases for Durban, 800 imp. galls., at 10¾d., £35 16s. 8d.; total, £1,486 4s. (Items 1 to 4 delivered f.o.b., Glasgow; item 5 delivered ex ship, Durban); cylinder oil to specification—in casks for Capetown, 3,500 imp. galls., at 10⅝d., £154 18s. 11½d.; in casks for Port Elizabeth, 700 imp. galls., at 10⅝d., £30 19s. 9½d.; in casks for East London, 2,150 imp. galls., at 10⅝d., £95 3s. 7¾.; in casks for Durban, 5,500 imp. galls., at 10⅝d., £243 9s. 9½d.; in cases for Durban, 2,500 imp. galls., at 1s. 1¾d., £143 4s. 7d.; total, £667 16s. 9¼d.; grand total, £2,153 19s. 9¼d. (Items 1 to 4 delivered f.o.b., Glasgow; item 5 delivered ex sip, Durban). Oats: Messrs. Lieberman and Buirski, Capetown—oats, 200 tons (ton of 2,000 lbs.), at £6 16s., £1,360 (delivered at Dock Gates): Messrs. S. Efroiken, Capetown—oats, 150 tons (ton of 2,000 lbs.), at £6 13s. 4d., £1,000. (delivered at Dock Gates). Teak, Rodesia: Mr. E. Meister, Bulawayo—logs 8ft. x 10in. x 10in. up to and including 12in. x. 12in., 13,500 cubic feet, at 4s., £2,700; logs 13in. x 13in. and upward, 4,500 cubic feet, at 4s. 6d., £1,012 10s.; total, £3,712 10s. (delivered f.o.r., Hardwoods Spur Siding). Vogelfontein Refresment Kiosk Lease: Mr. S. Abramson, Johannesburg—£13 per month. Graafwater-Olifants River Line—earthworks, etc., Messrs. E. Warren and Co., George, at approximately £15,669 2s. 6d. Salt River, Carriage Shop, extension of: Messrs. Baerecke and Klendgen, Johannesburg—supply and erection of building to form extension of carriage shed, Salt River, with Helliwell's glazing and copper instead of zinc caps to glazing bars, £10,995. Mooi River-Estcourt Deviation, Contracts 5 to 11 inclusive: Contract No. 5, Mr. J. Dunn, approximately, £6,197; No. 6, Mr. R. H. Cooper, approximately, £5,074; No 7, Mr. R. H. Cooper, approximately, £4,921; No. 8, Messrs. Still Bros., approximately, £5,350; No. 9, Mr. R. H. Cooper, approximately, £5,246; No. 10, Mr. G. Balladone, approximately, £4,679; No. 11, Mr. M. Agostino, approximately, £4,659 Bethlehem, New quarters: Mr. R. Kirkpatrick, Piet Retief—three pairs semi-detached quarters, foundations in concrete and remainder of buildings in brick, £3,150.

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Automobile Notes.

Question of Speed Limit.

The question of speed limit has always been a vexed one, and, judging by the present attitude of the authorities in the matter, will remain so indefinitely. In regard to the various Transvaal municipalities, the respective speed limits in force according to by-laws in the undermentioned towns are as follows: Johannesburg, Pretoria, Germiston, Boksburg, Boksburg North, and Roodepoort, 10 miles per hour; Benoni, 12 miles per hour; Krugersdorp, 8 miles per hour. Anything more absurd than the latter it would be difficult to imagine, taking into consideration the size of the town. Roodepoort-Maraisburg Municipality, adjoining that of Krugersdorp, it will be observed, have adopted a speed limit of 10 miles, against the sister township's 8 miles per hour, and it is interesting to remark, according to a correspondent at that place, in a contemporary, the Public Health Committee have recently recommended a speed limit of 12 miles in the Roodepoort municipal area, with a commendable rider to the effect that boards shall be erected to define the particular roads on which this limit should be enforced. With a view to rendering a public service, which would be appreciated to the full by the motorist community, would it not be advisable to recommend the introduction of a fixed speed limit for all towns in the Transvaal Province, to operate within the two miles radius, with signboards, similar to those just referred to, erected on all main approaches to the several towns, informing the motorist of his proximity to the limit zone? It might also be suggested, assuming that a measure of this nature were contemplated, that the Transvaal Automobile Club should decide the limit, recognising that among the many objects of this excellent organisation are those calculated to watch, protect and encourage the progress of automobilism. The club's opposition to reckless driving, or conduct in any way prejudicial to the interests of motoring, it may be mentioned in this connection, is clearly set forth in the provisions framed for the guidance of members. Apropos to the foregoing speed limit remarks, motorists will learn with pleasure that the sympathy of at least one prominent Magistrate, Mr. Hime, of Maritzburg, is extended to them, this gentleman being of opinion that the 12 miles limit is much too slow for motorists.

The Speed Limit in Court.

An interesting sidelight on the speed limit question was afforded in the Supreme Court at Capetown last week, arising out of an action—the issues of which, by the way, motor

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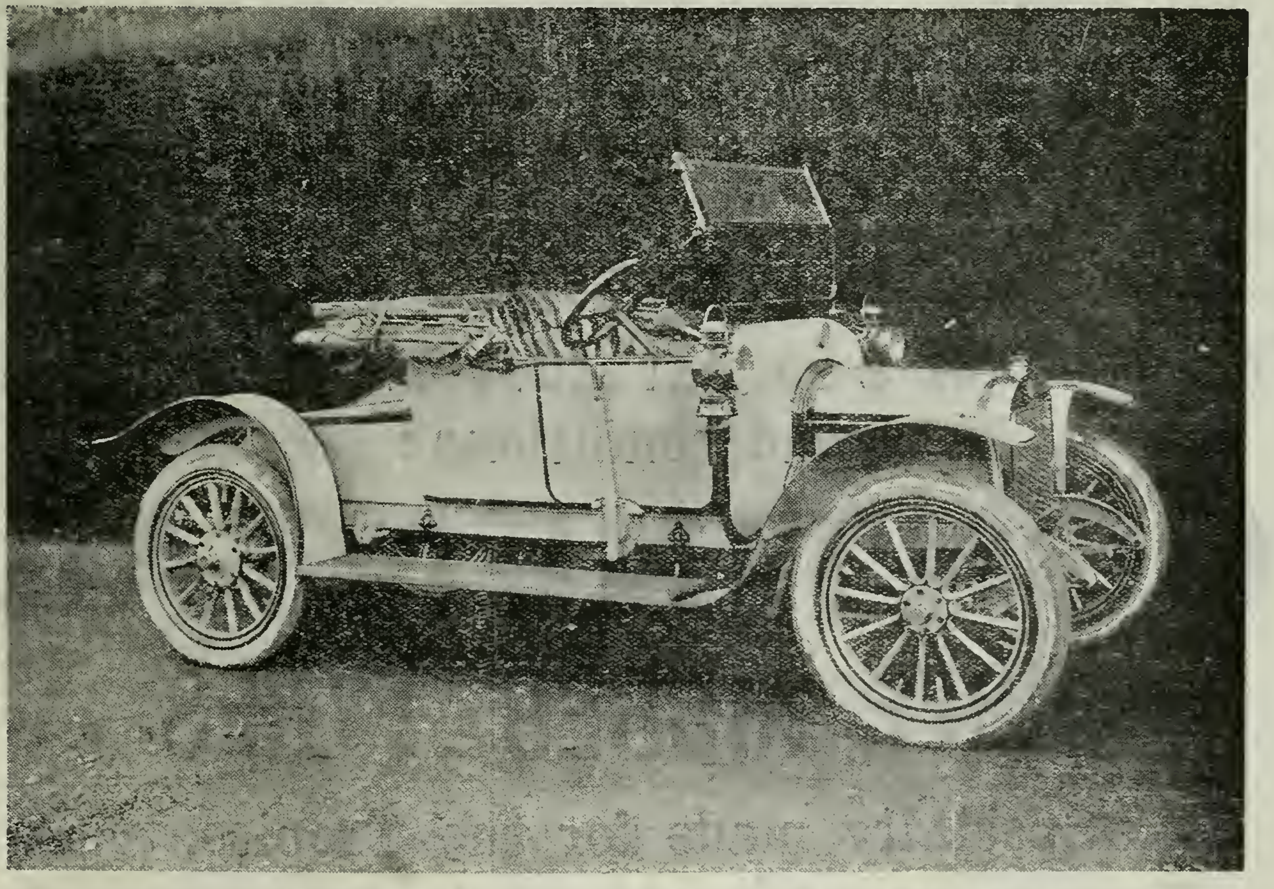

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cyclists will be well advised to consider—in the Resident Magistrate's Court, Johannesburg, for the recovery of damages to a motor cycle, as the result of a collision with a dog. The plaintiff in the latter court was successful, it being held that the primary cause of the accident was the rushing of the dog, and getting in front of the bicycle, and consequently the defendant was liable in damages. The Magistrate's finding, however, was reversed by the Transvaal Provincial Division, which held that a person travelling at the rate of 20 miles per hour, as was the plaintiff, in a street with a good deal of traffic, did so at his own risk, etc. Against this decision the plaintiff appealed to the Supreme Court. The Chief Justice, however, was not prepared to agree with the decision of the Provincial Division, that there was no negligence on the part of the defendant in allowing his dog to be at large in the street. The animal had been in the habit of rushing at bicycles, and the defendant must have been aware of this propensity. His Lordship pointed out that the plaintiff was travelling at 20 miles per hour, and going at this speed offered temptation to all the dogs in the street to give vent to their mischievous instinct, and in dismissing the appeal pointed out that a cyclist travelling at this rate in a public thoroughfare must accept all incidental risks. Sir James Rose-Innes, on the other hand, dissented from this decision, and delivered a judgment in which he held that the magistrate's finding was right and should be restored, contending, *inter alia*, that were the cyclist going at 15 or even 10 miles per hour the dog would probably have nevertheless attacked him, and that being so the liability of the defendant remained. Other Justices, however, concurred with the Chief Justice's finding, and, despite the differences of opinion among the learned gentlemen, the appeal was dismissed with costs.

The Dust Evil.

At the present time miles of the Johannesburg streets, unfortunately, lie inches deep in dust, notwithstanding the prevailing cry of "more roads and less dust," and the remedy from which to expect the long-desired reform expressed in the last clause of the terse sentence seems as remote as ever. The Municipality are ever open to receive remedial suggestions from those who have the welfare of Johannesburg at heart, on the many problems awaiting solution, one of the most important, it would appear, being the dust nuisance. Among the great cosmopolitan population which comprises Johannesburg, surely some workable suggestion should be forthcoming from the varied experiences in regard to the best system of road treatment to allay dust, adopted in one or other of the many cities and towns from whence the present population is recruited. The writer of this article, who has advocated mixing salt with the water employed for street sprinkling, will be pleased at any time to receive suggestions to combat the dust nuisance. In the matter of road construction much is being accomplished in Johannesburg and districts, last year alone 16 miles of new streets being made, and large sums are now set apart for this estimable public service. During the rainless season great efforts are put forward by the authorities in construction and repair work, but with the advent of the rains much surface damage occurs to roads, presenting a formidable task with which they, however, consistently battle. Briefly, it would appear that a proper recognition is seldom accorded those energetic bodies responsible for the construction and maintenance of roads, in the teeth of adverse climatic conditions.

T.A.C. Programme.

A satisfactory entry, it is expected, will characterise the next event on the Transvaal Automobile Club programme—the competition for the Park Cup Trophy, to be held on the 10th and 11th prox. In view of the remarkable results attending this contest last season it would be inadvisable to forecast the success of any individual competitor. Much interest centres in the event in which petrol consumption is the chief determining factor, and which will prove highly instructive in point of the respective capabilities of the machines under the exacting conditions imposed, and the performances will be eagerly awaited by the motorist community. In previous numbers of this journal reference was

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CONTINENTAL

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made to the venue, and rules and conditions governing the contest, etc.

A New Speciality.

What would seem a boon to South African motorists is made possible by the use of "Protectotires." These specialities are marketed by the Duval Tyre Company, South African rubber manufacturers, and consist of bands, easily attachable to part worn or damaged covers; in fact covers worn to the canvas when fitted with these protective bands render valuable service, and which under other circumstances would be discarded. The manufacturers claim the adoption of their speciality adds 2,000 miles to the life of ordinary tyres, and in addition prevents at least 90 per cent. of punctures and blow-outs. They are light and occupy no more room than a tube. Other features, which adapt them to South African conditions, are patent by reason of the fact that they do not heat, creep or pinch the tube, apart from the assurance of safety and comfort in travelling, they provide.

"Sunbeam" Success.

The magnificent success of the "Sunbeam" cars, in the three litre class, of the recent Grand Prix race, was not anticipated to such an extent as the actual achievement of first, second and third places showed. To quote the *Daily Mail* of the 27th June, "the most marked feature of the race was the brilliant performance of the three small British 'Sunbeams.'" This triumph of the English-built light car, in point of regularity and speed, aroused the enthusiasm of the public, and conclusively proved that Britain leads the world in the reliability and efficiency of motor car construction. The *Morning Post*, in its comment on the race, remarked that "the victory of the 'Sunbeam' has been so signal that the French admit the supremacy of the British industry." The performance is all the more remarkable owing to the fact that this British car was small in comparison with the opposing big racing machines, and competed so consistently throughout. The "Sunbeam," it may be added, is fast becoming a favourite with South African motorists, and much will probably be heard of this machine in coming T.A.C. competitions.

The Traffic Problem.

In commenting upon the traffic problem, *The Motor*, to hand, endorses the views so often expressed in these columns that "the periodical outbursts on 'the motor peril,' the 'death-dealing motor,' etc., have in the past been largely actuated by sheer prejudice," and quotes from a leading London paper on the subject, which says: "The first thing which it is absolutely necessary to recognise is that nothing effective can be done in the way of reform by means of attempts to put back the clock. There are people who imagine that the way out of the difficulty is to reduce the speed of all mechanically propelled vehicles to that of the ordinary horse-drawn variety, but it is better that it should be recognised at the start that nothing of the kind is possible. The speed of traffic will not diminish; it will rather tend to increase, and what we have to do is to find means whereby the crossing of roads by foot passengers in busy places will be rendered a comparatively safe and easy undertaking."

Companies in Liquidation.

British Bechuanaland Diamonds, Ltd.,; a general meeting will be held at 5, Corporation Buildings, Rissik Street, Johannesburg, on August 13th. Francis Becker, liquidator.

Main Reef Exploration Syndicate, Ltd. The; a general meeting will be held at 86, Johannesburg Stock Exchange Buildings, Fox Street, Johannesburg, August 6th. J. H. Rainier, liquidator.

McArthur Atkins and Co., Ltd.; general account and plan of distribution, and final distribution account, A.R.M.'s office, Johannesburg, and Master's office, Pretoria, for fourteen days from July 13th.

Niagara, Limited; a separate meeting of creditors and contributories was held before the A.R.M., Johannesburg, on July 16th.

Volksrust Roller Rink, Ltd. (voluntary), J. A. B. Joubert, liquidator.

Karee Diamond Prospecting Syndicate, Ltd., The; first and final liquidation and distribution account, 133 and 134, Stock Exchange Buildings, Johannesburg, for seven days from July 4th. Ralph Davis and J. H. L. Manisty, liquidators.

Kaffir Tin Development Co., Ltd.; a general meeting will be held at Harrison Street, Johannesburg, on August 13th. H. Williams, liquidator.

G. E. M. Exploration Syndicate, Ltd.; a general meeting will be held at Harrison Street, Johannesburg, on August 13th. H. Williams, liquidator.

Welgelegen Diamond Mining Co., Ltd., The; a general meeting will be held at No. 107, Exploration Buildings, Commissioner Street, Johannesburg, on August 15th.

Lisbon Berlyn, Ltd.; meeting, Master's office, Pretoria, July 19th. Henry St. John Hodges, liquidator.

Draaikraal Syndicate, Ltd. (voluntary); a meeting will be held at Bettelheim Buildings, Johannesburg, on August 6th; Henry Taylor, liquidator.

Union Mineral Statistics for June.

The report issued by the Department of Mines for the month of June shows that the Union produced minerals of a total value of £3,434,120, as compared with £3,565,524 in May. The gold output amounted to 754,846 fine ozs., of which all but 165 ozs. were produced by the Transvaal. The coal sold amounted to 637,982 tons, valued at £158,054, as compared with 728,664 tons of a value of £182,247 in May. There were thirty-three collieries producing in the Transvaal, eight in the Cape Province, five in the Orange Free State, and nineteen in Natal. Particulars of production are:—

	Tons Mined.	Tons Sold.	Value per Ton at Pit's Mouth
Transvaal	442,551	375,868	4/4
Cape	9,885	6,090	11/7
Orange Free State ...	52,953	42,896	5/6
Natal	292,902	213,128	5/7

With regard to base metals, it is to be observed that the Transvaal's output was 130 tons, and that of the Cape 1,166 tons. The Transvaal's shipments were valued at £3,175. The Transvaal produced 279 tons of cassiterite, and shipped tin ore worth £42,643 during the month.

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Our Twenty-First Anniversary Number.

THE LAST WORD ON RAND MINING.

To commemorate the twenty-first anniversary of the founding of this journal, a special number, distinct from the ordinary weekly issue, will be issued at the end of this month. Fittingly to mark the occasion, the number will contain a comprehensive and concise account of the past history, achievements and present position of every gold mine on the Rand, illustrated and brought down to the latest possible date. It will review the industry generally as well as in its several technical aspects, and will include articles by experts on the chemical, mining and metallurgical progress and problems of the fields. A feature will be made of the personal side of the industry, and a section will be devoted to its technical and administrative leaders, enriched with portraits and other illustrations. Engineering on the Rand in all its phases, electricity, steam and air power will be treated, and the growth and progress of electric power supply will be exhaustively discussed. The gold mines of the outside districts and the tin, copper and coal industries of those districts will be dealt with thoroughly and at first hand. The great diamond industry of South Africa will have a section to itself, and here, as in the treatment of the base metal industries, the letterpress will be embellished with many striking and original illustrations. Mining in the Cape, Natal and Orange Free State Provinces will also be reviewed and the undoubtedly great mineral potentialities of those, as yet undeveloped, areas will be graphically set forth. German South-West Africa will find a place in the issue and a first-hand account of the diamonds, the copper and the tin mines of that promising field will be included. Moreover, the banks and other great financial institutions, the railways and harbours of the sub-continent will be adequately dealt with, and the whole problem of transportation as it affects the inland industrial centres will be reviewed. In this connection Capetown, Port Elizabeth, Durban, East London, Delagoa Bay and Beira will be separately and fully treated and their claims examined. Apart from mining, there will be a considerable section devoted to a description of the several subsidiary industries dependent on mining for a market. Chief among these will be cement, explosives, soap and candle-making, milling and the hundred and one activities that centre in the Rand. Rhodesia and Mozambique will be given a separate and extended treatment. The different mines will be described and illustrated, and the recent progress of the industry in those territories dealt with comprehensively and lucidly. In addition, the issue will contain a number of interesting and valuable contributions from leading men in the mining and financial world, many of whom have already sent their congratulations on the decision to issue a special commemorative number of the journal. Numerous letters received from past Rand engineers and mine managers, now resident in all parts of the world, contain offer of contributions. These will form a unique collection of valuable views and reminiscences, and will considerably enhance the interest of the volume. The work will consist of upwards of 350 pages, printed throughout on art paper. Prizes are offered to artists for the best design of a suitable and striking character, and particulars are given in another part of this issue of other valuable prizes to be awarded in connection with the number. It may be added that the work will be prepared, produced and printed in South Africa, and will aim to cover the whole field of mining in this country, and to prove a fitting monument to the great industry with which, from the beginning, the *South African Mining Journal* has been associated. The co-operation of everyone interested in the industry is being enlisted to make the venture a success, and already it promises to mark an advance on anything of its kind ever before attempted in South African illustrated journalism.

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383. Leopold Siede and Arthur Street.—Improvements in and relating to sheep-shearing machines.
384. John Thomas Johnson and Frederick George Mason.—An improved cover for pneumatic tyres and method of manufacturing same.
385. George Gilbert Carter.—Improvements in acetylene lamps.
386. Stephen Masters.—Improved spraying nozzle.
387. George Twemlow.—Improvements relating to the extraction of gold or other metals from substances containing same.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

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Notes and News.

Mr. W. W. Mein in Canada.

We understand that Mr. W. W. Mein has been appointed Consulting Engineer to an important new Canadian mining and investment company recently formed with a capital of £1,000,000. Mr. Mein is in charge of the large mining interests of the venture, which is jointly controlled by Canadian and United States financiers. Mr. Ralph Stokes, Acting Underground Manager of the Western Section, Crown Mines, and well known for his works on mining, leaves to take up an important position with Mr. Mein next week.

* * * *

Cape Geological Commission.

The Cape Geological Commission has been dissolved, and the geologists working under it have been absorbed by the Union Geological Survey, which is a branch of the Mines Department. Mr. Merriman was chairman of the Cape Commission.

* * * *

Wonder Mine.

The directors and some of the shareholders of the Wonder Mine are still endeavouring to persuade the Government to publish the report recently made on the working of the mine. It is held that in justice to the property and to Natal mining generally, the real facts that led to the shutting down of the mine ought to be made public. It is understood that allegations of bad management are made in the report which the Government regards as of too personal a nature to make public.

* * * *

Mr. W. R. Dowling's Presidential Address.

Mr. W. R. Dowling, the new President of the Chemical, Metallurgical and Mining Society, presented his inaugural address at the meeting of the Society, held recently. The questions dealt with were mainly of domestic interest to the Society. In concluding, Mr. Dowling said: "I feel that I have not done justice to the time-honoured custom of the newly-elected President bringing forward his views on some particular technical matter and in generally reviewing the year's advances in chemistry, metallurgy or mining. I feel that, owing to precedent, there being no discussion on presidential addresses, the matter dealt with is not as valuable as when the views of the whole membership are concentrated on the matter in healthy criticism, so that I would rather present a paper at some future date."

* * * *

Mr. Spencer Resigning.

Mr. C. H. Spencer, general manager of the Consolidated Main Reef Mines and Estate, Ltd., and the Main Reef West, Ltd., under the control of S. Neumann & Co., is resigning the management of these properties, and will be succeeded by Mr. Healey, manager of the New Unified G.M. Company. Mr. Spencer is one of the best known managers on the Rand, and has been in charge of the Consolidated Main Reef and the associated properties—the Main Reef Deep, Main Reef East and Main Reef Deep (the two latter properties are now included in the Consolidated Main Reef)—for a long period of years.

* * * *

The Goerz Group.

Reports of the mines under the control of A. Goerz and Company for the past quarter are now to hand, from which we make the following extracts:—The May Consolidated's profit is down somewhat on the quarter, the earning for the three months ending June being £18,120, as compared with £20,167 in the preceding period. Working expenses were at the rate of 16s. 1d. per ton, and the working revenue 24s. 11d. per ton. Development for the quarter amounted to 128 feet, and no capital expenditure was incurred. The Princess Estate has not yet got into its stride, and the profit earned was only £126. Working revenue was at the rate of 25s. 8d. per ton, and expenditure 22s. 8d. The footage driven, sunk and risen on the reef was: South Reef, 535 feet, averaging 7·7 dwts over 25 inches, and Main Reef 110 feet, averaging 8·1 dwts. over 32 inches. The payable ore developed is estimated at 25,405 tons. At the Lancaster West working revenue came to £70,294, or 23s. 7d. per ton, and the profit to £3,111, or 1s. per ton. The profit for the previous quarter was £2,816. The total ore developed is estimated at 24,400 tons, and the payable tonnage to 7,605 tons. Geduld is doing very well at present. Profit for the whole of last year was £35,973, for the March quarter £12,091, and for the last three months £13,609.

* * * *

Reported Rich Strike at the Hay.

We learn that the position at the Hay Mine, in the Mazoe district, shows signs of improvement. The mine commenced productive operations under most promising conditions, but of recent months has failed to secure anything like the early returns. It is now reported that a valuable chute of ore, similar in character to that from which the early owners obtained such good results, has been discovered. Nothing very definite is as yet known as to its extent or value, but it is understood that the strike will have a favourable influence on the company's July output.

* * * *

Mining in the Hartley District.

In the Hartley district of Mashonaland several mines are hampered by water shortage, and there is no likelihood of improvement in this respect for some months to come. On the other hand, native labour is fairly plentiful, and on the whole the mines of the district appear to be maintaining their outputs and profits. Apart from the reported new strike in the neighbourhood of Gatooma, there is little of much interest happening in the Hartley mining area. Development work has been restarted on the Harvester Mine, an extension of the Pickstone, and in a direct line with the strike on that property. The " Try Again " Syndicate was due to start milling on the first of this month, and crushing is to commence on the Tea Reef at an early date. This month, too, it is intended to erect a five-stamp battery on the Cheshire Cat Mine, so that, despite the shortage of water, not a few small mine workers appear determined to take advantage of the present fairly plentiful supply of natives.

* * * *

The Kelvin Memorial.

The Institution of Mining and Metallurgy, in conjunction with the Institution of Civil Engineers, the Institution of Mechanical Engineers, and various other British and American societies, are issuing an appeal for funds in connection with a memorial to that great scientist, Lord Kelvin. A general committee, representing the engineering societies of the British Empire and of the United States of America, has been formed to carry into effect a proposal for the erection in Westminster Abbey of a memorial window. In a circular issued to all members, the President and Secretary of the Institution of Mining and Metallurgy write: " Acting on behalf of the representatives of this Society upon the general committee, we now beg leave to enlist your co-operation and support in this tribute of respect to the foremost man of science of his day, and a distinguished engineer long associated with the engineering profession in the application of scientific knowledge to enterprises of world-wide importance. We are to say that upon the estimates which have been formed for the cost of the window, and in view of the widespread support which the proposal will certainly receive, individual subscriptions to the memorial fund need not exceed £2; but, at the same time, it is not desired to restrict the gifts of those who may wish to make larger donations."

* * * *

Electrical Accidents.

Extracts from the annual report of H.M. Electrical Inspector of Factories for 1911 appear elsewhere in this issue. In it Mr. G. Scott Ram places on record the tale of accidents that have been brought to his notice during the year, compares it with previous records, and discusses the causes of such misadventures. A feature of the report is the frequency of accidents to skilled persons engaged in cleaning high-pressure switchgear—accidents that often prove fatal. Of all parts of an electrical installation, the switchboard is at once the most exposed and the most respected. Everybody about a high-pressure station is well aware of the hidden dangers of the switchboard—hidden, because electricity offers no indication of its presence. Elaborate safeguards are prescribed, to be observed before any person is given access to the cells containing the switchgear—yet, in spite of the best intentions, sometimes the most obvious and elementary precautions are omitted, with disastrous results. There is clearly a great want for a really effective and reliable indicator of the fact that an electric conductor is alive. Various devices have been put forward for this purpose, but apparently they do not adequately meet the case—otherwise they would surely be used. Unfortunately, however, very many of the accidents are to be ascribed to carelessness on the part of the person—often highly competent and experienced—who becomes the victim of the accident, and thus pays for his own slackness.

* * * *

Alluvial Gold.

Alluvial gold mining in South Africa, despite the announcements that have been made from time to time regarding discoveries, appears to date to have achieved very little. In the statistics issued by the Union Department of Mines for the month of June we observe that the total production of alluvial gold for the country was 119·7 fine ozs., valued at £505. This was contributed by ten declarants, eight of them being in the Transvaal. The Cape Colony yields the noble total of a fiver, a rather poor tribute to those " rich fields " of which so much was said a little while ago. Of the 118·7 ozs. produced by alluvial workers in the Transvaal, 104 ozs., or £442 worth, were derived from the Pilgrims Rest area.

* * * *

Diamonds in Portuguese Territory.

The Darwin correspondent of *Rhodesian Opinion* writes: " Messrs. Preuss and Durrheim, of the Diamond Syndicate, have passed through on their way to Portuguese territory, where they are stated to have obtained a concession over some five hundred square miles. We understand several prominent Salisburians are interested in the venture and wish them every success. Had the Chartered Company not wilfully stifled the diamond industry in this country by granting the monopoly to De Beers, the money would have been spent in this territory instead of going to benefit the Portuguese.

* * * *

The New Kleinfontein Report.

With its enlarged reduction plant in operation, the New Kleinfontein Company crushed 131,200 tons, or nearly 15,000 tons more than in the preceding three months. The net working profit was £58,566, or 8s. 11d. per ton, which compares very favourably with £41,426, or 7s. 7·6d. per ton earned in the previous quarter. Working costs were at the rate of 19s. 7·7d. per ton, or about 5d. per ton lower. Particulars of development work carried out during the quarter are as under:—Mine: Shaft sinking: Number of feet sunk, 523ft. 6in. Development: Number of feet driven, risen, and sunk (excluding shafts), 4,851ft. 9in.; footage sampled, 2,835ft.; average milling width, 44·25in.; average assay value, 8·69 dwts.

* * * *

Rooiberg Profits.

The Rooiberg Minerals Company earned a profit during the quarter ended with June last amounting to £11,833, the total production being 213·15 " long " tons of block tin. In addition the company had at the end of June concentrates in reserve amounting to 17·3 tons of a net value of £1,616. The total tonnage of accumulated partly treated product is estimated to amount to 44,486 tons of an average assay value of 2·51 per cent. metallic tin. The net expenditure for the three months amounted to £15,779, of which £10,786 were expended on machinery and plant, and the balance on shafts. Very rightly the directors of the company have decided that, as from July 1st, all expenditure on sinking, development, and exploration will be charged direct to working costs. This procedure, although it may tend to a reduction of the profit declared monthly, since the cost of this work has eventually to be met out of revenue, will in no way affect the monthly declared profit. The new arrangement should, as a matter of fact, furnish a better indication of the cash available for dividend than has been the case in the past. The most encouraging developments met with during the past quarter were secured on the 210 feet level.

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Record Tunnel Driving.

The United States correspondent of the Ingersoll-Rand Co., Johannesburg, has informed them that the tunnel-driving record for the United States has been broken by over 100 feet. The work in question was done at the Morenci property of the Arizona Copper Co. An 8 ft. x 9 ft. tunnel was driven 780 feet in 29 days, in porphyry. To accomplish this there were used two Type C-110 Ingersoll Rand drills; the cut holes were drilled 6 feet and the side holes 4 ft. In order to handle the large amount of "muck" two gangs of "muckers" were employed on each shift, one gang resting while the other was loading.

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Oceana Development Company.

The Oceana Company and its subsidiaries have of late passed through rather tempestuous times, but at the annual meeting of the Oceana Development Company, held in London a week or two ago, Mr. C. A. V. Conybeare, who presided, was able to throw a ray of hope and sunshine on the affairs of this concern. The capital of the company has been reduced from £150,000 to £75,000, and this has resulted advantageously to the shareholders. Before this was done they had been faced with a heavy deficit of £45,000, making the distribution of dividends out of the question—for some considerable time, at any rate. The reduction of capital has relieved shareholders of that incubus, and the profit and loss account now presented shows a profit of £1,366. Mr. Conybeare stated that, under the new order of things, they had land and investments of solid value represented by a sum of £40,000. In regard to the farms held by the company in the South-Western Transvaal, the Chairman said: "The item of Bloemhof Farms prospecting account represented an interest in a syndicate formed to prospect for diamonds on those farms. In the early part of last year there had been a great rush for diamonds in that neighbourhood, and at the last meeting he had stated that he saw no reason to doubt that that rush would extend to their own farms. Within a much shorter time than he had expected the rush had extended across country, and quite a big business was being done on Mooifontein, which was only a few miles from their own properties. As a result, they had been approached by a syndicate which wished to start prospecting for diamonds on the Bloemhof farms. Their interest in that syndicate was shown in the assets." This is satisfactory, but we cannot pass these references to the Bloemhof farms by without remarking what is common knowledge nowadays—that, rightly or wrongly, Mooifontein and the adjacent properties have gone quite out of public favour during the last month or two.

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Antelope.

Under the Gold Fields management the Antelope Gold Mine (Rhodesia), Ltd., bids fair to be a success. The company has an issued capital of £348,282 in 5s. shares, and on December 31 it possessed investments valued at £116,966, and cash aggregating £108,000, so that the financial position is excellent. The ore reserves are estimated at 102,000 tons, of a value of 40s. per ton, and a plant capable of treating 4,000 tons per month is to be installed. In his report Mr. Piper says that the poor results obtained in the east and west extensions are disappointing, but the main ore shoot in the central section is developing very satisfactorily. Work is to be pushed on with all possible speed, as two levels per year will have to be opened up if the ore reserves are to be maintained when the battery is crushing.

TOPICS OF THE WEEK.

THE IMPROVING OUTLOOK.

Pessimism cannot flourish long in the rare atmosphere of the Rand, and there are signs, every day growing more marked, that the depression is passing. The main reason for cheerfulness in the face of the prevailing gloom is that the immediate prospects of mining have greatly brightened. It is true that, though the gross output of the Rand is forging ahead, the profits are not keeping step. Lower grade rock is being crushed, and costs of many mines have shown a notable tendency to resist all efforts at reduction. But a movement is now apparent in the right direction. Elsewhere we print some striking figures showing how mines like the Simmer and Jack and Knights Deep are working at 10s. 9d. and 11s. 3d. per ton respectively, and the moral to be drawn from these figures is plain to read. Indeed, the Simmer is showing how, by careful mining, the lives of the outcrop mines may be prolonged many years beyond the official forecasts. For a deep level, the Knights Deep makes a particularly encouraging showing, fraught with significance for the whole Rand. In our last issue we indicated how costs may be reduced by co-operation in native labour recruiting, by the reduction of railway rates on coal, by cheaper power, by better living conditions on the mines, by the growth of local production, consequent on agricultural progress, and by the more mature study of local conditions now possible to the new technical men on the Rand. These things, undoubtedly, must throw a considerable weight in the scale of economy, and their influence is likely to prove none the less great because indefinite and imponderable. Of course, no review of the present conditions is complete without a reference to the question now being discussed regarding the new form of contract for underground work. The document, at any rate, constitutes a business-like contract. that is bound, in time, and with greater familiarity, to commend itself to the men, and to make for greater efficiency. Details of the better news from the majority of the mines will be found in the quarterly reports printed in this and our last issue. With few exceptions, the mines are able to report better results from development operations. At developing mines like the Springs, State Mine, Modder Deeps, and Rand Klip good progress continues to be made. The producing mines are almost all holding out promise of better things. The Geldenhuis Deep has experienced a chapter of accidents, but its troubles only throw into relief the continued uniform good fortune of the rest. Sir George Albu's remarks on a recent occasion may here profitably be repeated. Every day since they were uttered has gone to convince us of their soundness: "I trust," he said, "we have reached bedrock as regards both market conditions and labour troubles on the mines, and that we shall consequently be able to show an improvement in the position at the end of the current year." Referring to the present share market conditions, Sir George added: "I must state my conviction that the existing pessimism and apathy in regard to Rand mining companies has reached a point altogether unwarranted by the actual position of affairs on these fields, and that the present quotations for the shares of reputable and promising propositions—not only of profit-making mines, but also of properties in the developing stage—are standing at prices which in most cases represent a considerably lower level than the intrinsic value of the concerns in question. As an instance of this, I may say that there is quite a number of companies the shares of which to-day are quoted at a figure which does not represent even the actual expenditure on the equipment and development of their properties, and therefore does not allow a single penny for the value of the reef claims held." Though we fully share the general suspicion of mere market activity, yet we are convinced the overdue improvement in that department is the necessary forerunner to a quickening of business generally.

NATIVE LABOUR POSITION.

The inevitable reference to shortage of native labour forms a feature of many of the latest returns from the mines. It is, of course, the season of shortage, and no reorganisation of recruiting can hope to change the ebb and flow of the black labour tide. In June a notable decrease was shown, due principally to a large number of natives having taken their discharge; the wastage figure at this time of the year is always strongly influenced by local climatic conditions. During June rather severe weather was experienced, and therefore it was not surprising that the wastage figure for that month was high. Mr. Elkan pointed out recently that, generally speaking, the position of native labour at the moment was not—taking into consideration that we were in the middle of winter—unsatisfactory, and as regards the recruiting returns received, he was able to state that they showed an increase—for the first seventeen days of June the figures were 9,028 natives, as against 9,748 for the corresponding period of July, thus showing an increase of 720. Judging from past experience, he thought they must expect a further reduction in the number of natives employed by the mines during July. On the other hand, from the beginning of August the mines start receiving the first batches of new recruits from the latitudes north of 22 deg. South, and as this class of labour has caused much comment, it is noteworthy that the mortality figures for June show an appreciable reduction on the preceding month. Everything is being done by the employers of tropical natives to reduce the rate of mortality further, and satisfactory results are being achieved already. Possibly the worst rigours of winter are now over—the weather has certainly become milder—and boys may come back to work earlier than usual. Meanwhile, however, the great work of reorganising recruiting arrangements is proceeding apace, and it is understood that recruiters who come in direct contact with the natives will suffer the minimum of interference, and that "boys" will, as before, be allowed to go to work at the mine of their choice. The agitation which the Natal farmers and planters are attempting to work up is not considered a serious menace to the maintenance of the labour supply from that Province, because the ideas actuating the promoters are fundamentally wrong. The native cannot be hindered, short of force or illegal persuasion, from selling his labour in the best market for it, and, while the Rand remains the best market, it need not fear Natal competition. Already the farmers of that Province have secured the closing of many thickly populated native areas to Rand recruiters. That should content them. Yet another consideration affecting, indirectly, the Rand labour supply arises from the possible reopening of questions with the Portuguese Province of Mozambique. The Union Minister of Railways and the Railway Board are this week conferring with the Portuguese authorities at Delagoa Bay, but there is not the slightest reason to fear that any rearrangement of railway rates that may be agreed upon by the high contracting parties will affect the native recruiting in Portuguese territory, that is essential to the prosperity of the Union and Mozambique. In this connection, it is noteworthy that anyone who still cherishes the hope of seeing the Chinese return to this country—our farmers appear to be the last who favour the fond idea—will find in the speech made by the Minister of Mines at a function held in honour of the Imperial German Colonial Secretary, on Tuesday, an emphatic reminder of its impossibility. The Union Government is not likely to accede to the farmers' wishes—Rand mining people banished the idea years ago—in view of Mr. Malan's declaration on the subject. To sum up the position, the native labour problem, despite all the thought devoted to it, is still the most serious trouble the industry has to face; all mines suffer from it to some extent; some mines suffer to a serious extent, and one or two mines, in trouble from other causes, find by it their troubles aggravated enormously. Fortunately, the worst part of the year is nearly over, and the coming months are bound to see an amelioration of the position, making for improvement all round.

THE PAYMENT OF RAND MINERS.

Fortunately for mines and men, the efforts of the Labour agitators to create trouble over the new contract form for underground work on the Rand have, so far, been unsuccessful. Up to the present the men appear to have been unable to discover any intolerable hardship concealed in the new contract; and it is to be hoped, for their sakes, that the whole matter will be allowed to drop. It is obvious that closer study of the document and some practical acquaintance with its working have proved to the men that it is what it claims to be, an honest and genuine attempt to cope with a most unsatisfactory system of payment long prevailing underground on the Rand. A recent critic of the industry —Mr. James Chilton—has stated before the Chemical, Metallurgical, and Mining Society that the restlessness of the Rand miner is largely due to the lack of uniformity in the wage system that prevails here. He described the contract system on the mines as a never failing source of wonder and astonishment. How was it that two miners of equal ability, on the same mine, under similar conditions, differ so widely at the end of the month, one receiving sixty pounds, and the other perhaps a cheque for 8s.? In admitting that cases like these do occur, we by no means admit that the result is obtained by withholding any part of the miner's legal earnings. Managers and surveyors are as honest as any other section of the community, and the frequent charges of peculation brought against them are very seldom substantiated, yet with perfectly honest officials these incidents often happen. The miner receiving the small cheque naturally seeks fresh fields; no protests of innocence, no expression of polite regret; no stope plan or squared paper diagram, will convince him that he has received just treatment. The satisfied miner works on till his cheque comes down, and he departs also. Mining officials dread the end of the month for it invariably means a new set of men, with greater anxiety, and more accidents. The trouble is that there are too many large wage cheques and too many small ones. According to Mr. Chilton, the only way out is to increase the number of moderate cheques, as the new contract form is endeavouring to do. Mining conditions in the stopes and drives change rapidly from day to day, reef bodies widen or become narrower, and stoping widths vary as the ore body changes, foot wall and hanging parting become more distinct or disappear altogether. Some days the ore is hard to drill, on others it is bad to break, faults, dykes and fracture planes make their appearance and are passed over. In the midst of these changing conditons, one thing never changes, and that is the price per fathom or foot. Two rates are usually fixed, one for Main Reef conditions and the other for the South Reef, and these prices, like the law of the Medes and Persians, alter not. If on measuring day the miner comes out well, he has worked for it, if badly, he is simply unlucky. We quote from Mr. Chilton: "There are working places in many of our mines where men never have and never will make a living wage at the ruling prices, yet they are never changed, and month after month men sign on and leave with unfailing regularity. Where the conditions are uniform, and free from faults and dykes, a miner can make good wages consistently month after month, but unfortunately these places are not plentiful. The author is convinced that the curse of change, with its sequel of accident, will not be stayed until we deal with the system of payment underground. Let a fair average wage be agreed upon, and any miner making ten per cent. above that standard for three consecutive months should suffer such reductions as would bring him down to the average standard wage; on the other hand, a miner working where he is unable to make the average wage should receive an increase sufficient to bring him up to the standard wage. In this way the evils of high and low wages would be successfully resisted, and our wandering miners would cease to roam, and would identify themselves more strongly with the fortunes of their particular mines." Mr. Chilton, we believe, holds a responsible position on one of the mines. He has stated very forcibly the evils found in practice to attach to the contract system now being abolished. His views seem to us to make out a very convincing case for the trial, at least, of the new contract system, designed to obviate the worst evils of the old.

LARGE PROFITS ON FIVE-PENNYWEIGHT ORE.

What the Gold Fields Mines are Doing—A Study in Present-day Economics—How Mines Have Been Adapted to New Conditions.

The subject of working costs has received so much attention and has been written of so often and at such great length that we return to it with some diffidence. And yet it is a matter of such overwhelming importance that no word of apology is called for in again discussing some aspects of this great problem and presenting figures which bear in a vital manner on the subject. It is a long time ago since investors, directors, engineers and managers set their faces to the stern realisation that the Rand was no longer a 10-dwt. proposition, and it is always worth while examining statistics as to current grades, costs and profits in an endeavour to see how the efforts to maintain dividends on the lower rates of recovery per ton have succeeded or failed. To-day the Rand is not even a 7-dwt. concern. Taking May of this year as a representative month, it is to be observed that the Rand mines milled 2,177,348 tons for a total recovery of 746,948 fine ozs. of gold, equal to 6·71 dwts. per ton. In the first half of the current year dividends amounting to £3,744,282 were paid out, as compared with £3,680,266 in the second half of 1911, £4,082,817 in the first half of that year, and £4,523,610 in the second half of 1910.

Dividends and the Outlook.

There can be no denial of the fact that the Rand's dividend list for the first six months of 1912 shows a diminution when compared with the lists for the corresponding periods of the two preceding years. Certain it is that in the near future new companies, such as the Modderfontein B. and the City Deep, will help to swell the total; but, whilst we by no means count ourselves in the camp of the large army of pessimists, who see in recent happenings the Rand galloping onwards to speedy ruin, it must be admitted that the present position calls for improvement. We believe that it is coming, and, moreover, coming very quickly. The Rand has of late been in a transitory stage, a period of changing policies and of abnormal expense in regard to native labour recruiting and provision for combatting phthisis. The new labour organisation will certainly tend towards economy in recruitment charges, even if it does not improve the quantity and quality of the unskilled labour forthcoming for the mines. Working costs, unfortunately, have not of recent months exhibited any tendency to decline. On the contrary, they seem to have failed to respond to the many new innovations in policy and detail which have during the past year or two been adopted. It is perhaps a little early to judge the value of these changes. Low working expenses have, no doubt, been an unprofitable and economically unsound fetish in the past; but at the same time we must remark that some reduction in running expenditure consistent with the earning of maximum profits would be hailed with satisfaction. At some mines working expenses have risen during recent months in an alarming manner. Inefficient and insufficient native labour, combined with high recruiting charges, have undoubtedly been the prime evils, and it is hoped and believed that the new labour organisation will tend to a betterment in these directions. But, apart from all this, it would seem that the low range of working expenditure recorded by a large number of mines and by the Rand as a whole a year or two ago was either inconsistent with the principles of true and clean mining, or was else a standard of efficiency which the mines have not been able to maintain. The actual complement of labour available does not afford a criterion of efficiency. As we recently remarked, the mines under the control of the Consolidated Gold Fields of South Africa, with only about half their complement of native labour, show working costs lower than those of other groups with a much higher percentage of requirements. Nor are there any reasons for supposing that the quality of the labour employed on the subsidiaries of this corporation is better than that of other groups.

Gold Fields' Figures.

It is not our intention to institute any invidious comparisons as between different mines (a vast host of factors, many of which are incapable of contrast, preclude the practicability of doing this), but some direction of attention to the excellent returns recorded by mines of the Consolidated Gold Fields group on very low-grade ore is, we think, called for, if only to demonstrate what Rand management is capable of. Five of the six productive Rand subsidiaries under the control of the Consolidated Gold Fields of South Africa are deep levels, and three others are deep-deep levels. Four of these mines were in May of this year working ore of under 5 dwts. per ton recovery value, whilst the Simmer and Jack's return was under 5½ dwts., and that of the Robinson Deep 7⅓ dwts. per ton. The following table sets forth the salient features as to stamping equipment, tonnage crushed, costs and profits of the mines of the group in question:—

Mine.	Stamps.	Tube Mills.	Tons Milled.	Working Costs per Ton. (a)		(b)		(c)		Total Working Costs.	Profit.
				s.	d.	s.	d.	s.	d.	£	£
Jupiter	115	7	43,650	15	7	2	1	17	8	38,564	5,348
Knights Deep	270	6	60,330	11	0	0	2	11	2	33,693	17,090
Robinson Deep	230	5	51,000	16	2	2	4	18	6	47,173	35,705
Simmer and Jack	320	7	79,700	10	9	0	3	11	0	43,899	47,545
Simmer East	130	3	34,200	14	10	0	5	15	3	26,041	2,973
Simmer Deep	125	8	49,800	15	0	1	5	16	5	40,882	2,937

(a) Working costs per ton milled, exclusive of development.
(b) Amount spent per ton milled on development or development redemption charges.
(c) Total working costs per ton milled.

Figures for the Whole Witwatersrand.

There were during May 58 Rand mines declaring returns to the Chamber of Mines. These crushed 2,177,348 tons, employed 9,375 stamps and 258 tube mills. The average milling capacity per mine thus works out at 162 stamps and 4·4 tube mills, and the average tonnage crushed per month figures out at 37,368 tons per mine per month. The working costs per ton of ore milled averaged 18s. 9d., and the profits 9s. 10d. per ton. It is interesting to compare these figures with those of the Consolidated Gold Fields group alone. The following is the result:—

	Gold Fields Group.	Whole Rand.
Average number of stamps per mine ...	198	162
Average number of tube mills per mine	6	4·4
Average tonnage crushed per mine for the month	53,113	37,368
Recovery per ton	21/5	28/7
Costs per ton	14/5	18/9
Profit per ton	7/0	9/10

It will be seen from the above that the Gold Fields mines are operated on a larger milling basis (despite the fact that this group has such a notably small percentage of the labour complement required) than the average of Rand mines. The working costs for the group are 4s. 4d. below the Rand average, whilst the grade is less by 7s. 2d. Profits per ton are 2s. 10d. lower, but as against this the tonnage crushed per property is substantially greater. The Gold Fields management appear to have tackled the problem of earning profits on low-grade ore admirably. We do not suggest that other mines have not also faced the question in a highly commendable manner, but we do think that a contrast between the results secured by the Gold Fields group and those recorded by the whole Rand results in comparisons greatly to the advantage of that corporation. Admitting the marked "shortage" of labour, as evidenced in the labour statistics and complement percentages of the group, it may be argued that the mines of the Gold Fields group possess certain advantages, such as wide stopes, which do not obtain on other mines. Whatever may be said in favour of clean mining (and admittedly there is a great deal to be said), we incline to the view that in adapting themselves to the low-grade and shortage of labour conditons, by determining the average value per ton of the ore in the mine and then concentrating all effort on earning profits on ore of this average value, and by utilising machine drills wherever practicable, the Gold Fields mines have set a fine standard of achievement. No doubt the doctrine of clean stopes often has had to be waived aside, and it might well be argued that less waste rock could and should be broken. Here the consulting engineer and manager have to use their judgment, and when faced by the facts that the number of natives employed and their efficiency falls so short of requirements, other methods may secure the best results.

WHAT THE KNIGHTS DEEP IS DOING.

The Knights Deep figures have been particularly good for months past. In the year ended July 31, 1911, the expenses were at the rate of 11s. 5d. per ton. In the succeeding quarter they were reduced to 10s. 10d., and in November of last year to 10s. 6d. per ton. An examination of the Knights Deep assay plan shows that very few of the stopes are of over 6 or 7 dwts. value, and the normal recovery is only about 4 dwts. In some portions of the property as little as 2½ dwts. is regarded as the pay limit.

The preceding figures are given in no carping spirit or with a view to the institution of odious comparisons. They are presented rather to the end that more attention may be directed to the practicability of further lowering working expenses. The actual records of the Gold Fields group seem to demonstrate that organisation of labour and strenuous endeavour to reduce expenditure below a certain determined average, even in the face of a labour shortage amounting to 50 per cent., can do a good deal more than is actually being achieved to-day throughout the Rand. We regard the excellent results secured by the Gold Fields mines on 4 and 5 dwt. ore as one of the bright and encouraging features of the industry since it indicates the Rand's ability to adapt itself to conditions which a few years ago would have been deemed well nigh disastrous.

PROGRESS OF BARNATO MINES.

The Position at Government Areas—Consolidated Langlaagte Awaiting Power—Primrose and Ginsberg Doing Well.

As was shown in our last week's issue, the mines under Johannesburg Consolidated Investment Company control have been doing consistently well of late. As supplementing the particulars given in our last impression, we herewith give some further details of progress at four "Barnato" subsidiaries.

Sinking is proceeding satisfactorily in three shafts of the Modderfontein Government Gold Mining Areas, whilst development is being pushed on with from another. A station has been cut from the north-west shaft in the quartzites, it being deemed advisable to construct the station in the hard quartzite rather than in the slate footwall. Driving to the reef has been proceeding, and the ore body should be intersected at any moment now. The north-eastern shaft is nearing the reef, and in the south-west vertical sinking is proceeding rapidly. The footage in the south-east shaft (where a record was achieved some little while ago) has suffered somewhat in consequence of sinking having to be carried out in amygdoloidal diabase. All shafts on the "State Mines" property have to penetrate this sheet, and in the course of a little time excellent progress will again be recorded. Development work in the vicinity of the north-west shaft is being expedited by means of machine drills.

Everything is ready at the Consolidated Langlaagte Mines for the commencement of crushing at the new equipment, of which detailed descriptions have from time to time appeared in the columns of this journal. But there is not much likelihood of the mill starting up this month, and it will probably be the middle of September before sufficient power is supplied by the Victoria Falls Company to enable the battery and crusher stations to be operated. This is a great disappointment to the company, as the new plant has been ready for work since the beginning of last month, and the delay in the commencement of productive operations is much to be regretted. The profits of this mine, in common with the rest of the Barnato group, have been showing steady and consistent improvement of late, being £24,363 for the quarter ending March, £8,640 for the month of April, £9,239 for May, and £9,852 in respect of the June operations. For last year the profit per ton worked out at 6s. 9d., whereas the June return is at the rate of ten shillings.

The New Primrose, despite its age, shows no signs, as yet, of decay. In fact, this fine old mine appears to be doing better than ever. Exploration of the upper and abandoned levels has resulted in the reclamation of several valuable blocks of ground, and this, of course, has a very favourable influence on the life factor of the mine. As to profits, etc., it may be stated that, whereas the earning for the two months of 1911 was £211,384, the March quarter resulted in £51,045, whilst the April profit was £17,011, that for May £18,192, and for June £18,368.

The Ginsberg is also doing very satisfactorily. As at the New Primrose, and almost all other old outcrop mines along the Reef, much exploratory work remains to be carried out, especially in the upper levels, and further blocks of pay ore are continually being added to the reserve from these sources. Last year's profit-earning was at the rate of 8s. 6d. per ton, whereas the margin to-day is between nine and ten shillings. In addition, the tonnage milled has steadily increased, and the 1912 profit is certain to be very much higher than that for last year.

DIAMOND OCCURRENCES IN THE PRETORIA DISTRICT.

Large Number of Kimberlite Occurrences—Brief Petrographical Description of Chief Deposits—An Area of Extensive Crust-Movements.

(For map see following page.)

In view of the recrudescence of activity in diamond prospecting operations in the Pretoria district, the accompanying map, which shows the locality of all of the various kimberlite deposits, of one kind or another, should be found of special interest.

Kimberlite is known to occur in the following places in the Pretoria district:—(1) In the Premier pipe on Elandsfontein No. 85; (2) in the Beynespoort pipe on Beynespoort No. 520; (3) in the Zonderwater pipe on Zonderwater No. 178; (4) on Franspoort No. 426; (5) in the Pienaarspoort pipe on Pienaarspoort No. 500; (6) in the Montrose No. 1 pipe on Vryneb No. 74; (7) in the Montrose No. 2 pipe on the boundary between Vryneb and Rooikopjes No. 209; (8) in the Schuller pipe on Rietfontein No. 501; (9) in the Schuller-Kaalfontein pipe on the boundary between Rietfontein No. 501 and Kaalfontein No. 406; (10) on Kleinzonderhout No. 429. And to these may now be added Derdepoort No. 469, and, it is claimed by Mr. Wm. Bleloch, Roodeplaat No. 374 and Puntlyf No. 147. The latter property will be found at the extreme south-east corner of the map, and Kleinzonderhout No. 429 immediately adjoins it on the west.

The Derdepoort occurrence is, of course, of chief interest at the moment, and in connection with this it may be stated that the blue mica-bearing ground is said to have been examined by Mr. Max Weber some months ago and declared by him to be "kimberlite." This is satisfactory enough, as far as it goes, but the question of the area of the occurrence does not appear to have been anything like accurately decided. What is said to be kimberlite seems to be associated to a great extent with the other volcanic breccia, and is, indeed, considered by some to be a segregation from the main acid mass. The actual area of the segregated portions, or subsequent intrusions, whichever they may turn out to be, has yet to be calculated.

Dr. P. A. Wagner some time ago made an examination of most of the pipes referred to in the first list given above, and the following notes, taken from his lengthy contribution to the Geological Society on the subject, should be found useful: "All of these occurrences have been thoroughly prospected, and all of them, with the exception of the Beynespoort pipe, have yielded diamonds, though, as yet, only the Premier Mine has achieved any great measure of success as a diamond producer. At the same time, the widespread occurrence of diamond-bearing alluvium to the east and north-east of Pretoria, to which attention has already been directed by Mr. Kynaston, and the newly-reported discovery of diamondiferous yellow ground on Franspoort No. 426, are both indicative of the fact that the deposits above enumerated do not exhaust the potentialities of this area. The author gratefully acknowledges his indebtedness to Messrs. H. S. Harger and David Draper, and particularly to the former of these gentlemen, for specimens from, and valuable information regarding, Franspoort, Zonderwater, and Kleinzonderhout, which he did not visit.

General Considerations.

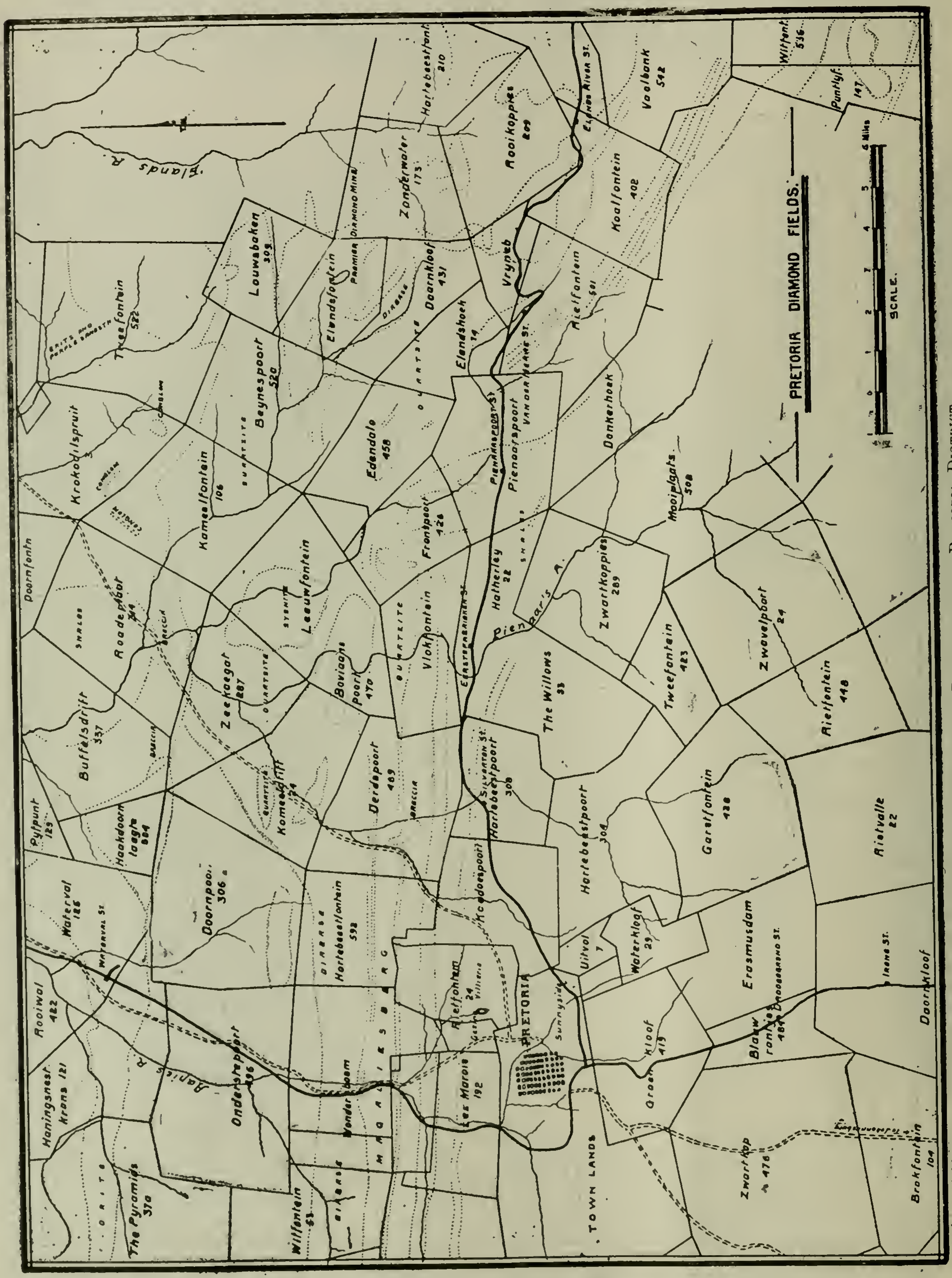
"It will be convenient at this juncture to point out that, notwithstanding minor differences in mineralogical, and presumably in chemical, composition, which are no doubt attributable in the first instance to processes of differentiation within the magma hearth from which the pipes and dykes were fed, the kimberlite from the different occurrences may be said to possess a common stamp. This is reflected in the relative abundance of the common accessory minerals. Of these, ilmenite is always very common, phlogopite and enstatite are occasionally present in fair quantity, though usually rare, while pyrope and diopside are as a general rule very rare. It is also reflected to some extent in the quality of the diamonds yielded by the different mines, for while exquisite stones are occasionally met with, the average product of the Pretoria fields is very mediocre. Neither is there any instance, as in the Kimberley group of pipes of two closely adjacent mines yielding diamonds which present marked differences in their physical characters.

Franspoort.

"The best preserved kimberlite obtainable in the Pretoria district is that of a dyke occurrence on Franspoort No. 426. It is a dark, heavy, basaltic rock, of which a megascopic examination reveals olivine to be the dominant constituent. In thin sections of this rock one sees numerous phenocrysts of olivine, which, together with occasional grains of ilmenite and isolated flakes of phlogopite, are set in a ground-mass consisting essentially of serpentine and calcite. Through this ground-mass there are scattered crystals of magnetite, apatite and picotite, in addition to which there is an abundance of chlorite in minute equi-dimensional flakes. Perowskite occurs in negligible quantities and appears to be entirely wanting in some sections. Among the olivine phenocrysts one can, as in the case of all truly porphyritic kimberlites, differentiate between (1) an older generation represented by large rounded and embayed grains, some of which appear to have resulted from the shattering of even larger individuals; and (2) a younger generation typically represented by small idiomorphic crystals or pseudomorphs after these. All of these phenocrysts exhibit a more or less advanced alteration into serpentine, and the majority of the smaller individuals have been completely replaced by this mineral. The phlogopite, which occurs in large bent flakes showing marginal chloritisation, has a very small axial angle and exhibits a weak "normal" pleochroism. Pyrope, usually in rounded grains encased by broad kelyphitic rinds, is occasionally met with; diopside, on the other hand, was never observed. Calcite is present in the ground-mass in minute homogeneous laths, the appearance of some of which suggests that they are pseudomorphous after a lath-shaped mineral originally present, though it is necessary in this connection to point out that in another specimen of the rock which was examined the habit of the calcite was found to be totally different. In its structure and in its mineralogical composition this Franspoort kimberlite is almost identical with the rock met with at great depths in the Kimberley mines. In fact, it only differs from the latter in its poorness in perowskite and magnetite, as a consequence of which the peculiar moulding of these minerals on the smaller phenocrysts of olivine, which is such a characteristic feature of the Kimberley rock, is never observed. Fine-grained Kimberlite.—In addition to the coarsely porphyritic rock described above, this Franspoort occurrence also yields a compact aphanitic kimberlite, and the alternation of layers of these two varieties results in some instances in the development of a peculiar banded structure. The newly-discovered pipe (?) on Franspoort is situated to the east of this dyke.

Schuller No. 1.

"The Schuller kimberlite has already been fully dealt with by Messrs. Kynaston and Hall and by the writer, and the present description is merely included for the sake of completeness. In hand-specimens the rock is seen to be composed of a dark grayish black ground-mass, through which are interspersed phenocrysts of olivine and dark wax-like pseudomorphs of antigorite after these. Ilmenite is fairly abundant, phlogopite, enstatite and pyrope but sparingly present, and diopside very rare. The pyrope is always surrounded by radially fibrous kelyphitic rinds, which merge outward into loose borders of magnetite. The microscope



Map showing Kimberlite Deposits in the Pretoria District.

shows that these megascopic constituents of the rock are accompanied by numerous smaller phenocrysts of olivine, which, as a rule, have been completely replaced by serpentine. The phenocrysts are embedded in a ground-mass of serpentine and chlorite, which is crowded with granules of perowskite and magnetite and minute flakes of mica; these being in some instances accompanied by rounded grains of an unidentified, highly refracting, isotropic mineral of yellowish colour. Calcite is generally present in considerable quantities, but may be entirely absent. The perowskite content of the rock appears to vary greatly, since this mineral is very abundant and well developed in some sections, and very rare in others. It is occasionally seen to form granular margins around the phenocrysts of ilmenite.

The Schuller-Kaalfontein Pipe.

" The closely adjacent Schuller-Kaalfontein pipe yields a very coarsely porphyritic kimberlite made up of large rounded, and completely serpentinised, phenocrysts of olivine lying in a matrix of a slaty blue colour. The ordinary kimberlite accessories are neither abundant nor well developed in this pipe.

Montrose No. 2.

" The blue ground of the Montrose No. 2 occurrence is similar in appearance to that of the Schuller-Kaalfontein. It pulverises very readily upon exposure to the atmospheric agencies, and on being washed yields a concentrate consisting principally of ilmenite, but also containing bronzite, pyrope, diopside, and phlogopite. Large nodular aggregates composed of olivine and enstatite are fairly common.

Montrose No. 1.

" The Montrose No. 1 pipe is chiefly remarkable for enclosing a large mass of hardibank, in which a pseudo-stratification or platy-structure is exceedingly well developed. Of the Pienaarspoort pipe very little is known beyond that it yields a good deal of ilmenite, and that test washings have proved it to be practically barren of diamonds.

Zonderwater.

" In the Zonderwater occurrence three distinct types of rock are met with: (1) A hard, coarsely porphyritic kimberlite of bluish black colour, with phenocrysts of olivine, ilmenite, phlogopite, and pyrope; the latter mineral being rather more abundant than is usual in the Pretoria district. (2) A compact aphanitic kimberlite. (3) Strongly serpentinised blue ground crowded with foreign inclusions, and closely resembling the blue ground met with in some parts of the Premier pipe. (1) A microscopic examination of the porphyritic variety reveals it to be texturally very similar to the Schuller rock. In its mineralogical composition, however, it differs from the latter in being much richer in magnetite and apatite, and in being practically free from perowskite. The phenocrysts of ilmenite generally show marginal inclusions of titanite, presumably of secondary origin. The ground-mass of the rock is always strongly impregnated with calcite. This Zonderwater kimberlite is of interest in enclosing nodules composed of olivine and enstatite and of diopside and phlogopite. (2) The fine-grained kimberlite owes its structure to the almost complete absence in it of the large phenocrysts of olivine belonging to the older generation.

Kleinzonderhout.

" On Kleinzonderhout, which lies at a considerable distance to the south of what is commonly regarded as being the southern limit of the Pretoria diamond fields, there is a large lenticular intrusion of kimberlite, which, according to Mr. Harger, represents the enlargement of a persistent dyke having a strike of N. 30° W. The deposit was extensively prospected by means of shafts and boreholes down to a depth of 60 feet, and a test washing of 440 loads of the material thus obtained yielded four small diamonds (one of these a well shaped octahedron) and about 10 garnets. This occurrence, again, yields a porphyritic and a fine-grained variety of kimberlite. A macroscopical examination of the porphyritic rock discloses a compact greenish black ground-mass, in which are embedded black serpentine pseudomorphs up to 3 millimetres in diameter, occasional phenocrysts of ilmenite, and flakes of a pale yellow mica. Under the microscope one sees that the large rounded pseudomorphs of serpentine, after olivine, are as usual accompanied by a generation of smaller ones, many of which exhibit idiomorphic outlines. The other constituents are perowskite, magnetite, phlogopite, apatite, chlorite, calcite, and granules and patches of a turbid decomposition product of a pale yellowish brown colour. The perowskite which is exceedingly abundant, is frequently moulded on the small serpentine pseudomorphs, and in some instances this mineral, together with magnetite in well-defined crystals, forms complete wreaths around these. Many of the larger grains of perowskite exhibit a zonary structure. They are made up of a rectangular core of dark violet brown colour, which is perfectly isotropic, and which is surrounded by a pale yellowish brown border exhibiting anomalous double refraction. The cubical cleavage of the mineral is often very distinct. The phlogopite, which occurs in the form of large flakes, appears to have been the last mineral to crystallise, since it encloses or is moulded upon all the other constituents of the rock. It shows alternation to chlorite, which not infrequently completely replaces it. In one of the microscopic sections of this rock a small nodule of olivine and phlogopite was observed. The fine-grained kimberlite has a specific gravity of 3·04, which is in excess of that of any other decomposed kimberlite. This high specific gravity is due, in part, to the large amount of magnetite and perowskite which the rock contains, the latter mineral being even more abundant than in the porphyritic variety; the large individuals of phlogopite referred to in the description of the latter are here replaced by smaller flakes of the same mineral. There is again a considerable development of the turbid granules referred to above. Optically these are characterised by possessing a high refractive index and by being so weakly birefringent that it is necessary to employ a gypsum plate in order to be able to make out any change in colour as the section is rotated between crossed nicols. They are very slowly decomposed by concentrated acids, the solution thus obtained yielding the micro-chemical reaction for lime, and the residue that for silica. Their specific gravity exceeds 3·1.

The Premier Pipe.

" The Premier pipe has now been worked out down to an average depth of one hundred and twenty-five feet, and, while the state of preservation of the material available for petrographical examination still leaves much to be desired, the excavations have nevertheless brought out a number of features of interest, to several of which brief reference will be made.

Passage from Yellow Ground to Blue Ground.

" Sections exposed on the various working faces indicate that the contact between the yellow ground, developed in the uppermost levels of the pipe, and the blue ground, by which this is succeeded at an average depth of from thirty-five to forty feet, is extremely irregular, and that the actual distance below the surface at which the change takes place is dependent primarily upon the facilities afforded by the blue ground for the downward percolation of surface waters holding oxygen in solution. Thus the highly fissured and fractured portions of the blue ground, inasmuch as they favour the percolation of such waters, are always found to be altered down to greater depths than the compact portions of the rock; and for the same reason one frequently meets with narrow veins or tongues of yellow ground, developed along fissures in the blue ground, penetrating the latter down to the 110 feet and even down to the 160 feet levels of the mine. These veins are sometimes vertical and generally inclined, occasionally, however, there is a similar development of yellow ground along horizontal or curvilinear joints, in which case one is treated to the novel spectacle of narrow layers of yellow ground alternating with such of blue ground.

THE BLUE GROUND.

"Megascopically, it is possible to distinguish between at least four varieties of blue ground. These are:—

"(1) What may be termed the normal Premier blue ground. It is of a dark bluish gray colour, breaks with an uneven fracture, and is slightly unctuous to the touch. In the vicinity of some of the dyke intrusions, to which reference will be subsequently made, this variety, which is ordinarily very rapidly disintegrated on exposure to the atmospheric agencies, has, through a secondary impregnation by calcite, been converted into a refractory hardibank.

"(2) A dark bluish green variety developed in the central portion of the pipe, and which, except for its colour, is identical with the first.

"(3) A bluish black variety, of which there is a slight development to the west of the 'Number 4' haulage in the western portion of the mine. This rock breaks with a sub-conchoidal fracture, and possesses a greasy lustre owing to the presence of innumerable black wax-like pseudomorphs after olivine.

"(4) A pale bluish gray variety exposed in the 'Number 4' working, which is very soft and distinctly greasy to the touch.

"The microscopical examination of the blue ground reveals the interesting fact that these differences in the appearance and properties of the rock are determined largely by differences in the nature of the secondary minerals resulting from the decomposition of the olivine phenocrysts."

Messrs. Kynaston and Hall, of the Geological Survey, remark with regard to this district:—"Why should these diamond pipes occur in the particular area where they happen to be found? Is there any geological reason why they should occur there rather than in any other locality, or is their occurrence purely accidental? Now, as we have already pointed out, the whole of the Pretoria series in this area has been considerably affected by certain crust movements, the effect of which has been to bend the strata round in a south-easterly direction. This movement has been accompanied by oblique dislocations of the strata, which have naturally been greatest about the point where this bending back of the sedimentary series has taken place. And this change of strike, as we have already seen, commenced suddenly quite close to our diamond fields. Now the connection between volcanic vents and lines of weakness in the earth's crust, caused by earth-movement and dislocations of the strata, is well established. There may be good reason, therefore, for supposing that such lines of weakness have been set up in this particular area, and that thus these weak points have been finally taken advantage of by the volcanic forces which were eventually the direct cause of the production of the diamond pipes. We are much more likely, then, to find diamondiferous vents and volcanic phenomena of all kinds in areas of disturbance and crust movement, rather than in those areas which have undergone no particular movements at all."

APEX—BENONI NEGOTIATIONS: REAL REASON FOR FAILURE.

Interesting Official Statement.

THE following interesting correspondence appeared in the London papers in mail week, *apropos* of the Apex-Benoni negotiations. The *Times* of 3rd July had the following:—"A private cablegram received in the City from Johannesburg last night states that it is understood that at the Apex annual meeting to-day details of the recent negotiations for the amalgamation of the Benoni and Apex companies will be outlined and explanations will be given as to why the negotiations failed. It appears that both boards favoured amalgamation, but before coming to any decision they agreed upon the employment of an independent consulting engineer—Mr. Leslie, of the Consolidated Gold Fields—to report upon the whole scheme. Mr. Leslie's report, which will probably be published to-day, strongly recommended amalgamation, and gave valuations of the two companies. The Apex board unanimously recommended the purchase of the Benoni assets for 80,000 Apex shares plus £200,000 to meet the liabilities of the Benoni Company. The Anglo-French board in London, however—the controlling house of the Apex and Benoni companies—dissented from Mr. Leslie's report, and was not prepared to accept the Apex board's recommendation. Hence the failure of the negotiations, which included a substantial guarantee towards the £600,000 working capital requirements." On 4th July, the following statement by the Anglo-French Company appeared:—"To the Editor of the *Times*—Sir,—In view of the communication on this subject which appears in your issue of this day's date, and in which my company is referred to, I am instructed by my board to state the following:—In their opinion the proposed amalgamation scheme is not in accordance with the respective values of the assets of the two companies as estimated by Mr. Leslie, but gives an undue advantage to the Benoni Company. They consider that the scheme, which involves the creation of an overwhelming amount of First Mortgage Debentures convertible into shares at a very low price, would be detrimental to the interests of the existing Apex shareholders. My board do not arrogate to themselves the control of a company on the board of which they are only represented by two directors and on which other South African houses are also represented. They would be glad to see the board of the Apex Company bring forward a well-considered scheme for the further development of the gold section of the property, and trust that such a scheme would meet with the support of the shareholders.—I am, Sir, Your obedient servant, DOUGLAS THOMSON, Secretary, Anglo-French Exploration Company, 208-221, Salisbury House, E.C., July 3."

Pniel Diamonds.

The Pniel Diamond Mining Company, Limited, announce that Natal Kopje and Beaconkop (Bakenskop), on the Old Pniel Estate, are now open to diggers. With a view to facilitating washing operations, and no doubt cheapening the cost to diggers, the company are laying pipes from the river, and diggers will now be able to have a continuous supply of water in close proximity to their machines. Applications for claims and all particulars may be obtained from Mr. S. F. Stokes, attorney, Barkly West, or at the company's offices at Jacob's Rush.

Stock Exchange Brokerage Charges.

From August 1st the following new scale of charges for brokerage will come in force on the Johannesburg Stock Exchange: For transactions in shares of 5s. or under, ½d. per share; for transactions in shares over 5s. to 10s., 1d. per share; for transactions in shares over 10s. to 20s., 1½d. per share; for transactions in shares over 20s. to 30s., 2d. per share; for transactions in shares over 30s. to 50s., 3d. per share; over 50s., at the rate of ½ per cent.—subject to a minimum charge of 5s.

LIVING CONDITIONS OF RAND MINERS.

The Sociological Work of the Mining Houses—Clean, Healthy Homes and Workers' Proprietorship—The Campaign Against Phthisis—What is Still Wanting.

During the course of the last twenty-five years, while the mining industry of the Rand, endowed with all that goes to the making of a strong and vigorous life, has been responsive to the impulse of expansion and development which is a national consequence of this condition, there have been various epochs when particular phases of progress have been more or less marked, and have influenced, in greater or less degree, the operation of every branch of activity into which the work of mining and recovering the precious metal has ramified. It is not necessary, perhaps, to enumerate these periods or dwell in detail upon their characteristics, but, among the more prominent, it may be remarked, are the amalgamation period, that of the Chinese experiment, and the era of the low working cost crusade, to take only three well-defined stages of mining policy which, although they overlap somewhat, are sufficiently marked to illustrate the special influences referred to. The present period of mining, it seems to us, is likely to be no less distinguished than the others by special tendencies and a distinct policy which are not difficult to discern already in the efforts that are being made to ameliorate the living conditions of the miner, both on the surface and underground. It is not to be assumed that these efforts are being made now for the first time. Ever since the Main Reef series gave promise of permanence the condition of the white worker has attracted the attention of his employers and been the subject of their earnest consideration. In 1897, when a Commission was appointed by the Kruger Government to investigate and report upon the many grievances and burdens of the mining industry, the incidence of the heavy railway rates upon the living conditions of the white miners was frequently and extensively discussed by directors, engineers and others who appeared to give evidence. "The conditions prevailing here," said Mr. J. Harry Johns, then General Manager of the Ferreira, "differ from those of many other countries; the brute force required in mining we endeavour to get from the natives, while we aim to get intelligence and energy in our white miners, and if we have to pay a little more for it, it is, nevertheless, the cheapest labour we can employ. . . . . White labour constitutes a very important item of expenditure on our mines, and if, through a reduction of railway rates, duties on foodstuffs, etc., cost of living becomes sufficiently reduced to enable our white employees to settle here with their families much of the money now being sent to other countries would be spent here."

A Distant View of Area Proposed for Mr. R. W. Schumacher's House Ownership Scheme.

Pre-War Difficulties.

The fact that the difficulties which beset the industry in pre-war days were so intolerable as to necessitate the nomination of a State Commission to take evidence upon the position, and the general feeling of uncertainty and apprehension which prevailed with regard to the future, particularly about this time, abundantly explains the small measure of achievement on the part of the mining groups in the matter of improving the surroundings of their employees. Later on the war intervened, and in the long months of re-organisation and re-establishment which followed the consideration of sociological schemes was of necessity delayed. The provision of an adequate labour supply was an obvious preliminary to the planning of methods by which the labour force could be maintained in circumstances which would ensure efficiency, and it will readily be admitted, we believe, that the efforts required to secure the first condition were such as demanded almost undivided attention. It was not long, however, before the problem of the miners' personal claims was taken seriously in hand. If humane motives were insufficient to have prompted this course—and there is no reason to suppose that directors and mine managers are less endowed by nature with these sentiments than are other men—the irresistible laws of industrial economics would have been cogent enough. There are few employers of labour upon any scale, and probably none who employ men in large numbers, who fail to recognise that importance of healthy minds and healthy bodies which is concisely expressed in one of the oldest of extant Greek apothegms and has been re-discovered, so to say, in the great workshops of to-day. It is unnecessary to consider the question of motives in this connection; the point we wish to make is that upon the lowest grounds of elementary self-protection, and the teachings of ordinary common-sense, it was incumbent upon the mining houses of the Rand to undertake those schemes of general betterment of the miners' living conditions which it is the humour of their critics to speak of as having been forced upon them. The problem of the miners' personal claims, as we have said, was taken in hand as soon after the war as circumstances would permit, and one of the first results of this enterprise was the improvement of miners' quarters and the planning of industrial villages, which were carried out with no niggardly hand, and with the assistance of the best available architectural experience.

Healthy Mining Villages.

The development of the housing scheme, particularly under the direction of the boards of the Eckstein group, was not long in progress before comfortable and cheerful homes, with proper sanitary provision, were everywhere in evidence; other groups were no less active in carrying out similar improvements, until to-day the standard of artisan dwelling accommodation considered necessary by the mining houses may be said, unhesitatingly, to be in itself adequate and well devised, and, generally, to be equalled by few in any other part of the world and excelled probably by none. The process of betterment in this respect has not ceased, but is still active wherever the means of carrying it out are at hand, and invariably in those places where additional housing room has to be provided. The personal claims of the miners do not end here, however. There are others, and one cannot state them better than as they appear in a statement handed in to the Mining Industry Commission of 1907 by Mr. John Joseph Ware, on behalf of the Witwatersrand Trades and Labour Council. On the subject of house accommodation, the statement proceeds:—"Rents here are very high and few of the employees own their own properties. If the State could see their way to co-operating with workmen towards bringing about a method that would enable the employees to acquire homes of their own, then these men, having a stake in the country, would feel interested in the welfare of the town and in the preservation of their property. They would feel that they were not a mere floating population, but that they had an interest in the stability of everything in the vicinity. Moreover, if a small quantity of land, say a quarter of an acre, for example, could be attached to each home, then, during the summer season there would be an opportunity for the mine worker when he left his occupation, to indulge in the beautiful, useful, and profitable business of attending to a garden, where he, his wife and children could meet in common interest; then there would be some home life for them, instead of, as is very often the case in a mining district, the mine worker going from the mine, taking his evening meal, then resorting to the hotel or town away from his family."

The Small Ownership Scheme.

In spite of the idyllic beauty of the scene conjured up so vividly by Mr. Ware, and regardless of the sociological advantages so accurately outlined by him, the Government has, until lately, displayed no eagerness to fall in with the proposals. It has been left to the mining houses to formulate a scheme whereby miners should become possessed of all those real advantages which attach to the ownership of a home and even a modest portion of land—and in this, as in other humane and elevating endeavours, the Eckstein group, represented by Mr. Raymond W. Schumacher, has taken a decided and vigorous lead. Mr. Schumacher has, in fact, identified himself with the small ownership movement to an extent that assures success, if success is possible, and it is gratifying to find that the Government, urged in that direction by Mr. Chaplin and others on his side of the House of Assembly, has latterly shown a disposition to assist an enterprise which is taking practical shape under such excellent auspices. It is difficult to say at this early stage of the proceedings how beneficial and widespread the results of the scheme are likely to be. If other circumstances prove as favourable as the hope to make them so is genuine and earnest, the advantages to the individual miner, the industry, and the State may well be incalculable. The undertakings so far referred to are those which concern the comfort and contentment of the miner when, as Mr. Ware remarks, he has "left his occupation," and when "going from the mine, taking his evening meal," he has time and inclination to ponder over the amenities of home and enjoy the delights of social intercourse. Before all these things are to be reckoned the healthiness of his surroundings underground, and in this matter, as befits its importance, the mining houses, abundantly regulated if only shabbily assisted by the Government, are working thoroughly and with determination.

The War Against Phthisis.

A campaign against the fearful disease known as miners' phthisis—a disease to the prevalence of which the miners of the Witwatersrand, by reason of their intensive methods of mining, are particularly exposed—has been in progress for some time past, and already, we are assured, the systematic course of action adopted has succeeded in throwing valuable light upon much that has hitherto been obscure, and has given ground for the belief that the scourge will, at no distant date, be practically eradicated. Among the measures taken to attain this end the numerous ventilation plans which have been carried out in the mines by means of mechanical appliances of the best kind and the largest dimensions may again be referred to. As sources of pure air, they not only remove some of the worst causes of enfeebled and diseased lung, in the shape of noxious "mine gases," but they contribute to the comfort and efficiency of the miner who is not of necessity exposed to these dangers. Here, again, there was no question of compulsion, but, as was shown at the East Rand Proprietary Mines, a voluntary endeavour to ameliorate living conditions as soon as the necessity for it became apparent and opportunity presented itself. The legislative action which has lately been taken with the object of providing for those who have become victims of the disease and those who may in the future succumb to its attacks, has met with the solid support of the leaders of the mining industry upon every point at which their sympathy could reasonably have been looked for. In only one respect, that of the apportionment of liability, have they felt called upon to make a protest. As the main source, directly and indirectly, of the prosperity and credit of the country, the gold mining industry of the Witwatersrand may justly claim to be relieved of a material proportion of the indemnity which has by common consent been granted by Parliament to those who have lost health and strength in the work of building up this great asset. If the basic principle involved in the doctrine of the unearned increment is a sound one, the argument is equally sound that those who enjoy an unearned increment from one end of the country to another, as a result of the enterprise of the mining companies of the Rand, should be liable to some taxation in respect of it, whenever taxation of the retrospective kind, such as that to indemnify phthisis, is decided upon. However that may be, the mining houses of the Rand have been satisfied with recording a protest against the indefensible attitude of the Government, and have set themselves to the work of assisting the Miners' Phthisis Board in every way in which assistance may be rendered.

The Government's Turn.

It is difficult to see in what other directions than those so far discussed in this article the leaders of the mining industry can strive to ameliorate the living conditions of the miner. That they can be improved still further, however, is a matter which requires little demonstration to those who, like the miners themselves, find their lines cast in the Transvaal. The cost of living is another and quite a different problem from that of the way of living, although it has no small amount of bearing upon it, as was shown abundantly in the voluminous evidence taken by the Kruger Commission. It is a problem that awaits solution at the hands of the Government.

Manicaland Mineral Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of June is as follows:—Reef: Mill—Gold won (fine gold), 360 ozs. 1 dwt. 14 grs.; tons crushed, 950; value, £1,512 5s. 1d.

CLAIMS AND PROSPECTING PERMITS.

Interesting Figures for the Last Three Half-years—An Index to Activity in Outlying Districts.

A STUDY of the statement contained in the statistics issued by the Mines Department of the Union for the month of June, which relates to prospecting permits, digger's and base metal claims registered and held at the end of the past three half-years, affords much interesting food for reflection.

COMPARATIVE FIGURES FOR PERMITS AND CLAIMS.

The figures given concern the Transvaal only, and are for base metals as well as gold. The returns show a marked falling-off in the number of permits taken out for the purpose of "prospecting" on the Witwatersrand area, and in each of the three Rand districts, Johannesburg, Boksburg and Krugersdorp, a diminution in the number of claims held is to be observed. This is particularly the case in the Krugersdorp or western area, where at the end of June of this year 17,959 claims were held, as compared with 20,086 at the end of December last, and 24,231 at the end of June, 1911. Of the outlying limits of the Rand, Heidelberg and Klerksdorp, it may be remarked that, whereas a very noticeable decline in prospecting permits and claims held is to be observed in the figures given for the Klerksdorp area, Heidelberg seems to have engaged more attention, and the number of claims held at the end of June was slightly greater than at the close of last year. Barberton, Pilgrims Rest and Pietersburg each record a somewhat lesser number of prospecting permits than at the end of December last, but the figures show an advance over those obtaining at the end of June 1911. In regard to claims there were 14,079 claims held in the Barberton district a month ago (of which more than half were registered under base metal title), a figure which compares with 13,396 at the end of 1911 and 11,379 at June 30th of last year. Pilgrims Rest shows a small increase, but in the Pietersburg area, despite the advance of railways into the heart of the Zoutpansberg, there were under 51,000 claims held as against 60,216 claims six months before and 68,087 at the middle of last year.

BASE METAL PROPERTIES.

Of the 60,741 base metal claims registered in the Province at the end of June, 1912, 51,000 were in respect of properties held in the Pietersburg district, which, of course, includes the tin fields of the Waterberg and the copper mines in the vicinity of the Limpopo River. Next to Pietersburg the Barberton district comes second in point of potential base metal importance, there being 8,530 claims held under this title. It is worthy of note that 277 "base metal" claims are held in the Boksburg district. The figures seem to indicate that whereas there has been a slight decrease in prospecting activity throughout the Transvaal as a whole, this has been attended by increases in permits and claims held in certain districts. Presumably a natural weeding-out and selective process has been proceeding. As an instance of failure to prove profitable values and subsequent abandonment, the case of the Cyferfontein property, in the Klerksdorp district—which largely accounts for the decline in the number of claims held in that locality—may be cited. On the other hand one observes increases in such popular localities as Pilgrims Rest and Barberton. The figures are of particular interest, and we accordingly print a digest of them hereunder:—

District.	Prospecting Permits.			Base Metal Claim .			Total Claims.		
	June 30, 1911.	Dec. 31, 1911.	June 30, 1912.	June 30, 1911.	Dec. 31, 1911.	June 30, 1912.	June 30, 1911.	Dec. 31, 1911.	June 30, 1912.
Johannesburg	131	166	114	—	—	—	17,535	17,670	17,397
Krugersdorp	9	6	2	—	—	—	24,231	20,086	17,959
Boksburg	2	3	2	309	309	277	31,014	30,568	26,234
Heidelberg	12	10	16	—	—	—	10,589	10,193	10,206
Klerksdorp	90	78	39	30	—	49	11,945	5,315	3,322
Ottoshoop	9	10	36	617	617	617	659	658	698
Pretoria	28	23	23	—	—	11	—	—	11
Barberton	189	249	230	4,758	7,274	8,530	11,379	13,396	14,079
Pilgrims Rest	91	138	136	—	200	250	5,793	7,124	7,139
Pietersburg	187	242	216	64,763	57,244	51,007	68,087	60,216	53,966
Totals	748	925	814	70,477	65,644	60,741	181,232	165,226	151,011

Rooiberg Minerals.

The report of the Rooiberg Minerals Development Company, Ltd., for the quarter ended 30th June, 1912, states: Ten stamps of the old mill ran 87·683 days, crushing 4,323 tons (2,000 lbs.) of ore, the duty per stamp per 24 hours being 4·93 short tons. Ten stamps of the new mill ran 27·157 days, crushing 2,504 tons (2,000 lbs.) of ore, the duty per stamp per 24 hours being 9·22 short tons. The output for the quarter was 213·15 tons (2,240 lbs.) of black tin. The estimated profit for the quarter was £11,833 7s. 7d., excluding allowance for mining taxation. The concentrates in reserve at the 30th June amounted to 17·33 long tons, having a net value of £1,616. The total tonnage of accumulated partly treated product is estimated to amount to 44,486 tons, of an average assay value of 2·51 per cent. metallic tin. Development results for the quarter averaged about the same as those for the preceding quarters; the most encouraging having been met with on the 210 feet level. A considerable tonnage of high-grade ore for milling purposes has been obtained from trench No. 15, in the neighbourhood of old camp workings, while in the camp shaft workings, good ore continues to be exposed on the east and west drives on the 30 feet level. The capital expenditure for the quarter amounted to £15,779 6s. 10d. From 1st July, 1912, the method of placing the company's accounts before shareholders will be revised, in that from that date all expenditure on shaft sinking, development and exploration will be charged direct to working costs as incurred. This procedure may tend to a reduction of the profit declared monthly, but, as the cost of this work has eventually to be met out of working revenue, it is clear that the rate of dividend will in no way be affected by the change, and that the monthly declared profit will, under the new arrangement, furnish a better indication of the cash available for dividend purposes than has been the case in the past.

TRANSVAAL DIAMOND FIELDS: JUNE RETURNS.

Bloemhof First Among Twenty-five Centres—Detailed Figures of Month's Finds.

Details of the diamond returns for June show that Bloemhof continued to occupy first place in the list of producers, with a total of 1,904¼ carats, valued at £9,043 1s., from 401 returns, a decrease in value of £2,317 in comparison with the month of May. Of the returns 175 were under £10 in value, 32 ranged from £50 to £100 in value, and 13 were over £100, viz.: £226, £198, £182, £152, £152, £151, £143, £139, £128, £126, £125, £116, £115. There were eleven parcels of diamonds of more than £100 in value registered.

Mooifontein a Close Second.

Mooifontein, with 1,859½ carats, valued at £7,377 15s., runs Bloemhof close as far as weight is concerned, but in value the difference is nearly £1,600 in Bloemhof's favour. Mooifontein's total is £2,366 less than that for May. Last month 235 separate returns were made, 14 of which exceeded £100, 32 ranged from £50 to £98, while 99 were less than £10. The highest return was £483, representing 146¾ carats; the next was £317, being 105¼ carats, and the third £266, being 33 carats.

Panfontein-Weltevreden.

Panfontein still maintains third place on the list with 719½ carats, valued at £2,777 1s. 6d. This was made up of 80 returns, of which seven exceeded £100, and 14 ranged from £50 to £100. One stone was found of 20½ carats, valued at £45, another of 12¾ carats, valued at £35 10s., and two stones, aggregating 28¾ carats, valued at £112 10s. Weltevreden occupied fourth place with 374½ carats, valued at £1,607 11s., comprising 46 returns. Five of these were over £100 in value, one parcel of 41 stones weighing 41¼ carats, being valued at £227 10s., and another parcel of 49 carats being valued at £298. Four returns ranged from £51 10s. to £84. One stone found weighed 20½ carats, but was valued at only £5 6s., while another weighing 10¾ carats was valued at £76.

London-Blesbokfontein.

London comes next with 292¾ carats, valued at £1,072 5s., which was made up of 36 returns. None of the returns were over £100, but six ranged from £50 5s. to £95 10s. Blesbokfontein, with 249¾ carats, valued at £1,014 10s., showed a considerable increase over the previous month. Seven returns were made, including a parcel of 85¼ carats, valued at £395 15s., and another of 92 carats at £328. The best single stone was one of 12¼ carats, which was valued at £156.

Christiana-Grootdoorns.

Christiana made 20 returns, showing a total of 87¼ carats, valued at £637 7s. 6d. One return amounted to £227 10s.; then came returns of £89, £84 and £83, and seven returns ranging from £10 to £50. Grootdoorns accounted for 108¾ carats, valued at £531 5s. Only two returns were made. One stone of 11¼ carats, valued at £92 15s., was included in a parcel of 87½ carats, valued at £425 15s., while the other return was a parcel of 21¼ carats, valued at £105 10s.

Kromellenboog-Koksrust-Rietput.

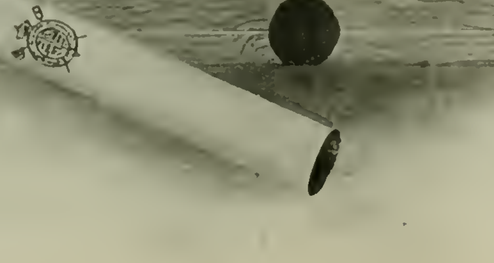
Kromellenboog was responsible for 57 carats, valued at £463 5s. There was only one return, and this included a 28-carat stone, valued at £336. Koksrust showed one return of 113¼ carats, valued at £426 17s. 6d. Rieput registered 68 carats valued at £371 10s. Three returns were made, including one of 33½ carats, valued at £244, and another of 29¾ carats at £110.

Modderkraal-Kuilfontein.

Modderkraal showed a big falling off compared with preceding months, its aggregate being 77½ carats, valued at £336 17s. 6d. This was made up of 15 returns, ten ranging from £10 to £50, and one stone of 10½ carats, valued at £42 10s., was registered. Kuilfontein accounted for 93¾ carats, valued at £327 12s. 6d., from 18 separate returns. One parcel of 37 carats, valued at £127 7s. 6d., was included in the returns.

Goedgenoeg and Other Fields.

Goedgenoeg has fallen from eighth to fourteenth place. Its total of 28½ carats, valued at £220 5s., was shared by six people, and the largest stones were 8 carats, valued at £80, and 7½ carats, valued at £29. The eleven other localities making returns were as follows: Goedehoop, two returns, 35 carats, valued at £104, which included two stones weighing 24 carats, valued at £51 10s.; Koppiesvlei, two returns, 23½ carats, valued at £63 5s.; Verlatenkraal, two returns, 12 carats, valued at £47 10s.; Avondster, one return, 13¾ carats, valued at £44; Boschpan, two returns, 7¾ carats, valued at £33 10s.; Vaalbosch, one return, 8½ carats, valued at £32; Schweizer-Reneke, one return, valued at £29; Doornbult, two returns, 6¼ carats, valued at £28; Rooikraal, one return, 3¼ carats, valued at £9 10s.; Boschkop, one return, 1½ carats, valued at £9; and Kalkfontein, one return, 1 carat, valued at £5 10s.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THE STATE AND THE PROSPECTOR.

Needs of the "Outside" Districts—Discoverer's Rights Question—Encouragement Wanted—Inequitable Claim Licences.

It would seem that certain amendments are required, necessary to the local conditions of the gold fields outside the Rand areas, says the Pilgrims and Sabie paper. To gain recognition of these matters is the work of the various associations in every district which exist for the furtherance of the mining interest. To touch lightly, however, on some of the matters that would seem to call for newer legislation, the first one that suggests itself to us is the law relative to discoverer's rights. It does seem to bear hardly on the other prospectors of an area that so soon as one man gets discoverer's rights they have to cease work and lose whatever they have put into the ground. And not only this, but the discoverer may have much inferior prospects to some of the others, yet he may peg his fifty claims or so wherever he cares to on the farm. And, again, two men may apply for rights at the same time, though such a case has not as yet cropped up, we fancy. It is a difficult problem, for the Government can hardly force owners to have their farms prospected, giving rights to each individual owner. The question of compensation seems inevitable either to the owner in one case or to the prospectors who have to leave, for the work done, on the other. The chief prospector who discovers gold without reference to the gainer now is the owner, who spends nothing and gains a free prospect of his farm. If prospecting is to be encouraged something must be done to protect the interests of the prospector, so that he may not be suddenly ordered off his work, losing all, possibly when within an ace of opening up a payable reef. Then there is another matter where adjustment would benefit the claimholder in a district such as this where the reefs are flat. Under the present law we pay the same licence rate as the Rand man, whose reef goes down almost or altogether vertical, so that a few claims will suffice him, while a man here has to peg a large area to cover the same amount of reef. To a small man without capital, who is struggling along with a fair hope of success, the lessening of licence money would mean much. On the same basis the ground value of a New York skyscraper is of the same value as that of a one-storey building, which is absurd, yet this is exactly the trouble here, for a claim which covers a portion of reef of a few inches width requires the same expenditure in licence money as a claim, say, on the Rand, where the reef may go down vertically for some thousand feet. Another matter which might profitably be put before our Government is the formation of a Mining Bank. We have a Land Bank, and grants in aid are made for fencing and other items, to allow the settler getting firmly on his feet, but little or nothing is done for the miner. He is advised to go to the large mining machinery houses, who will give him his mill and other machinery with which to start. True, but the trouble is that these houses ask such a big rate of interest that men are loth to trouble them. What we want is a similar system to that in vogue in Rhodesia and other mining countries, where a man, having a payable proposition, may apply to the Government, who send their engineer to report and, if his report be favourable, the necessary machinery is forthcoming as a fair rate of interest. Much is done by the Government in making roads and bridges which help the miner considerably, but the same direct help should be asked for that is given to the farmer. Now again, apart from the geological survey that takes place from time to time, little is done by Government to open up the mining areas. To turn to America, we find that the estimates for the year which commenced on the 1st July of this year provide for the expenditure of nearly £150,000 to be spent in investigating methods of mining, prevention of accidents, uses of explosives and electricity, analysing and testing of coals, etc., treatment of ores, the prevention of waste, opening up of new districts and devising means of treating profitably low-grade ores. This is what is wanted here. We want the Government to realise that the gold industry is a very important one for the country, and that they must lay themselves out to provide some scheme to encourage prospectors. At present there are many obstacles in the way that discourage men who would otherwise help to open up the industry on fields such as these, and they go to other countries where the Gold Law is more equitably framed than ours.

Middlevlei Estate.

The report of the directors of the Middlevlei Estate and Gold Mining Company, Ltd., for the year ended June 30th, 1912, states that the area of the property remains unchanged, and comprises freehold portion of farm Middlevlei No. 6, in the district of Krugersdorp, in extent 964 morgen 490 square roods, on which the company owns two mynpacts, in extent 132 morgen 424 square roods, equivalent to a claim area of 191·098 claims. During the year under review the company sold the trees in the three small plantations for £192. The cash balance of the company at June 30th, 1912, was £10,795 4s. 3d., of which £10,775 was on fixed deposit. It will be seen from the published accounts that the balance to the debit of income and expenditure account at June 30th, 1912, was £23,395 13s. 3d., made up as follows: Balance to debit of income and expenditure account at June 30th, 1911, £23,411 3s. 6d.; less excess of income over expenditure during the year ended June 30th, 1912, £15 10s. 3d.

Mr. F. D. P. Chaplin, M.L.A., presided at the ordinary general meeting of shareholders, held last week. In moving the adoption of the report and accounts, Mr. Chaplin said: There is practically no information to give you other than that which is contained in the reports now before you. The position is, in effect, the same as it was a year ago. Such mining operations as have taken place in the vicinity of your property have not produced any encouraging results. You will see that during the year trees in the three small plantations have been sold for £192, and revenue from rents, dividends and interest exceeded expenses during the year by £15 10s. 3d. The cash balance at the 30th of June was £10,795 4s. 3d., of which £10,775 was on fixed deposit. The report and accounts were adopted.

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JUNE COSTS, YIELD, AND PROFITS.

Analysis of the Gold Production for the Month—Steady Reduction in Costs.

The usual monthly analysis of the gold production for June issued by the Chamber of Mines is presented hereunder :—

THE WITWATERSRAND

	Total value recovered. £	Value recovered per ton milled. s.	d.	Total working cost per ton milled. s.	d.	Total working costs. £	Working profit. £	Working profit per ton milled. s.	d.
1. Aurora West United ...	17,649	25	4	19	6	13,617	4,036	5	9
2. Bantjes Consolidated ...	34,215	28	2	23	5	28,133	5,527	4	7
3. Benoni Consolidated ...	353	—		—		—	—	—	
4. Brakpan Mines	89,584	32	3	17	6	48,179	40,804	14	9
5. Cinderella Cons.	25,444	28	5	24	0	21,460	4,058	4	6
6. City Deep	75,168	36	9	23	9	47,896	25,048	12	6
7. City and Suburban ...	52,621	37	9	22	1	30,296	21,676	15	9
8. Cons. Langlaagte	30,150	26	11	21	3	20,495	9,654	10	0
9. Cons. Main Reef	34,993	29	9	20	0	23,522	11,558	9	10
10. Crown Mines	255,161	31	8	17	9	143,279	108 878	13	6
11. Durban Roodepoort ...	14,778	21	7	15	6	10,640	4,140	6	0
12. Durban Rood. Deep ...	37,533	31	9	24	4	28,787	8,259	7	0
13. East Rand Proprietary.	249.881	31	9	20	7	157,642	92,256	12	1
14. Ferreira Deep	104.307	38	11	20	8	54,454	46,749	17	9
15. Geduld Proprietary ...	18,626	26	0	20	5	14,631	3,950	5	6
16. Geldenhuis Deep	83,447	31	6	26	3	68,814	13,552	5	2
17. Ginsberg	21,566	30	2	20	7	14,694	6,870	9	7
18. Glencairn Main Reef ...	16,456	15	9	14	1	13,679	2,777	2	10
19. Jumpers-cum-Treasury .	14,158	34	10	35	8	13,776	2,000	5	2
20. Jupiter	41,471	18	8	17	3	37,292	4,860	2	3
21. Knight Central	27,521	24	6	20	2	22,692	4,469	4	0
22. Knights Deep	50,187	16	10	11	2	33.692	15,901	5	4
23. Lancaster West	24,492	24	10	22	5	21.735	2,698	2	9
24. Langlaagte Estate ...	61,964	21	3	17	8	45,929	15,206	5	10
25. Luipaardsvlei Estate ..	15,755	18	10	17	6	14,172	1,027	1	3
26. Main Reef West	32,355	32	9	20	6	20,305	11.671	11	10
27. May Consolidated ...	17,828	23	11	15	9	11,749	6,034	8	1
28. Meyer and Charlton ...	25,852	37	3	18	5	12,769	16.788	24	2
29. Modderfontein B. ...	60,067	37	5	17	10	28,560	30.821	19	2
30. New Goch	26,574	20	5	16	9	21,790	4.748	3	8
31. New Heriot	23,876	37	7	23	9	14,501	9,110	14	11
32. New Kleinfontein ...	72,216	29	4	19	7	48.209	23,038	9	4
33. New Modderfontein ...	86.225	40	10	21	8	45.476	39,774	18	11
34. New Primrose	35,711	28	8	14	8	17.596	18,116	15	1
35 New Rietfontein	20,045	25	2	21	9	17,107	2,941	3	9
36. New Unified	17,161	30	3	21	8	12,079	5.083	9	1
37. Nourse Mines	84,067	30	8	21	1	57,208	25,796	9	6
38. Princess Estate	24,514	26	11	26	1	23,734	720	0	9
39 Randfontein Central .	249 478	25	0	17	5	173.306	73,261	7	5
40 Robinson	104,724	44	6	15	10	36,354	66.702	29	1
41. Robinson Deep	80.023	29	6	16	5	43,816	32,898	12	1
42 Roodepoort United ...	30.660	17	0	16	2	27,318	3,442	2	0
43 Rose Deep	95,837	30	7	18	1	57.127	37,662	12	0
44. Simmer and Jack ...	86.955	22	11	10	11	41,523	44,428	11	9
45. Simmer East	31,369	18	9	14	10	24,791	6,168	3	8
46. Simmer Deep	44.015	17	3	15	10	39,089	4,304	1	9
47 Spes Bona Tribute ...	6,529	21	3	—		—	—	—	
48 Van Ryn	50.765	26	11	16	0	30,340	23,985	12	8
49. Village Deep	69.998	28	8	19	10	48,435	20,660	8	6
50. Village Main Reef ...	79.012	39	3	18	0	35,709	41,149	20	9
51. Vogelstruis Estate ...	12.773	22	0	21	1	11,540	1,263	2	4
52. West Rand Central ...	3,581	27	0	29	9	3,529	54	0	5
53. West Rand Cons.... ...	35.970	26	5	22	3	29,586	6,346	4	9
54. Witwatersrand	46,559	23	6	14	2	28,072	18,486	9	4
55. Wit. Deep	52,859	28	7	19	0	35,134	17,207	9	4
56. Wolhuter	40,290	27	4	17	2	25,244	15,026	10	7
Miscellaneous producers	24,262	—		—		—	—	—	
Witwatersrand totals	3,069,360	28	5	18	6	1951502	1063634	10	1
				54 cos.		54 cos.	54 cos.	54 cos.	

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

	Total value recovered. £	Value recovered per ton milled. s.	d.	Total working cost per ton milled. s.	d.	Total working costs. £	Working profit. £	Working profit per ton milled. s.	d.
HEIDELBERG—									
1. Nigel	19,629	30	10	23	1	15,005	4,402	6	9
2. Sub Nigel	8,096	37	8	32	6	6,996	980	4	9
BARBERTON—									
3. Barrett	714	5	6	—		—	—	—	
4. Sheba	15,959	48	9	27	0	8,845	3,844	11	9
5. Sheba (Rosetta)	1,253	28	8	—		—	—	—	
6. Worcester	5,539	22	2	—		—	—	—	
LYDENBURG—									
7. Glynn's Lydenburg ...	7,298	45	7	24	8	3,943	3,248	20	4
8. Transvaal G.M. Estates	36,637	55	7	21	8	14,251	21,780	33	1
Miscellaneous producers	37,251	—		—		—	—	—	
Total (outside districts)	133,157	39	5	24	5	49,040	34,254	17	0
				5 cos.		5 cos.	5 cos.	5 cos.	
Grand totals	3,202.517	28	8	18	8	2000542	1097888	10	3

A comparison of value recovered per ton milled, working costs and profits per ton with May shows that the value recovered on the Witwatersrand for June was 28s. 5d., or 1d. per ton less than in May. Working costs in June were 18s. 6d.; for May, 18s. 10d.; for April, 19s.; for March, 18s. 11d.; for February, 19s. 2d.; for January, 18s. 10d. For January, 1911. the tonnage milled was 1,855,232; for February, 1,712,198 tons; for March, 1,960.678 tons; for April, 1,926.583 tons; for May, 2,002,926 tons; for June, 1,989,559 tons; for July, 2,095,220 tons; for August, 2,107,809 tons; for September, 2,037,329 tons; for October, 2,083.900 tons; for November. 2,089,387 tons; for December, 2,030,437 tons; for January. 1912, 2,067.161 tons; for February, 1,980,396 tons; for March, 2.163,993 tons; for April, 2,059,562 tons; for May, 2.177.348 tons; and now for June, 2,110.657 tons. In the outside districts the total tonnage milled was 48,065, making a total for the Transvaal of 2,158,122 tons.

The working profits declared for the Transvaal since the commencement of 1911 are :

	1911. £	1912. £	Inc. £	Dec. £
January	954.536	1,021,073	66.537	
February	898.738	930.739	32,001	
March	973.470	1,245.321	271,851	
April	1,000.043	1,042,076	42,033	
May	981.788	1,110.463	128.675	
June	987,557	1,097,888	110,331	

The dividends declared during the six months were:

	1911.		1912.
January	£124,782	....	£99,782
February	23.699	....	25,987
March	295,384	....	257,528
April	64,500	....	75,250
May	58.500	....	46.000
June	3,649,891	....	3,332,465

The total dividends for the six months were: June, 1911, £4,216,756; June, 1912, £3,837,012.

New Kleinfontein.

The report of operations at New Kleinfontein Mine for the three months ended the 30th of June, states that 523ft. 6in. of shaft sinking was done. On development work 1,851ft. 9in. were driven, risen, and sunk, of which 2,835ft. were sampled. Over an average milling width of 14.25in. the average assay value was 8.69 dwt. There were 131,200 tons milled during the period, the estimated value of the gold recovered being £187,442 or 28s. 6.881d. per ton. Working costs were £128,876, or 19s. 7.748d. per ton, which left a net working profit of £58,566, or 8s. 11.133d. per ton. No allowance is included in the above statement for the Government Profit Tax, which is estimated at £1,972, or for interest amounting to £2,360. Capital expenditure for the quarter was £32,027. made up of shaft sinking £9,332. and surface equipment £22.695. The ore reserves at the end of the quarter were as follows: Payable, 1.141,072 tons, milling width 14.26in., value 7.88 dwt.; unpayable, 474,981 tons, milling width 40.51in., value 3.57 dwt.; totals and averages, 1,616,056 tons, 13.15in. milling midth. 6.61 dwt. value.

The secretary of the Consolidated Mines Selection Company has received a cable announcing the death of Mr. Francis Muir, the chairman of the company.

THE MINERS' PHTHISIS ACT.

Principal Regulations under the Act—Forms and Information Asked—Terms of Compensation.

The Miners' Phthisis Act (No. 19 of 1912) came into force upon the 1st inst. It is notified, however, that no applications for benefits under the Act should be made to the Miners' Phthisis Board (Secretary, Miners' Phthisis Board, 3rd Floor, Post Office Buildings, P.O. Box 4566, Johannesburg) until Tuesday, the 6th August, 1912. The following are Regulations framed under the provisions of the Act:

1. In these regulations—"Board" shall mean the Board constituted in terms of section three of the Act and published under Goverent Notice No. 972, dated 15th July, 1912, or any amendment thereof; "schedule" shall mean the schedule attached to these regulations.

2. Every application statement, or certificate made under the Act or these regulations shall be addressed to the Secretary to the Board, P.O. Box 4566, Johannesburg, unless otherwise provided for in the Act or these regulations.

II.—*Contributions by Employers, Compensation Fund.*

1. A statement of account in respect of the amount due to the Compensation Fund by each employer, under section five of the Act, shall be rendered by the Board to every employer on or before the last day of the first month of each period of three months. The amount shown to be due therein shall be paid on or before the 15th day of the following month.

Insurance Fund.

2. The employer, in terms of sub-section (3) of section *nine* of the Act shall transmit to the Board a statement before the tenth day of every month in Form "AA" of the schedule, together with the monthly contributions due to the Insurance Fund in respect thereof.

III.—*Applications.*

1. Every application of a miner shall be made in the Form "A" of the schedule, and the certificate on the back thereof shall be made and signed by his medical adviser. Such application and certificate shall be accompanied by: (a) The applicant's blasting certificate; (b) The certificates of service or his discharge tickets;

2. Every application by a widow or widow and children of a deceased miner shall be made in the Form "B" of the schedule and shall be accompanied by: (a) A copy of her certificate of marriage with the deceased miner; (b) The certificate of his death; (c) His certificates of service or his discharge tickets.

3. Every application of other dependents of the deceased miner shall be made in the Form "C" of the schedule and shall be accompanied by: (a) The certificate of birth or baptism of such dependent; (b) Satisfactory proof of relationship to the deceased miner; (c) A statement of the nature and extent of the support afforded by the deceased; (d) The certificate of death of the deceased miner; (e) The certificates of service or the discharge tickets of the deceased miner.

4. Every application made by an executor, in terms of section *twenty-nine* of the Act, shall be supported by the certificates and proofs required in paragraph 3 (*mutatis mutandis*), together with such proof of appointment of executorship as the Board may require.

5. Every election under sub-section (1) of section *twenty-two* of the Act—by a person other than a miner or native labourer—consenting to deductions from his earnings shall be made in the Form "D" of the schedule and thereupon be forwarded to the Board. Every application for benefits by such person under sub-section (2) of that section shall be made in the Form "A" of the schedule.

6. Every applicant shall furnish such further or additional documentary proof or other evidence and information as may be required by the Board.

IV.—*Medical Examination.*

1. When a miner desires to obtain benefits under the Act and submits a claim in terms of sub-section (1) of section *twenty-three* and the Board requires him to submit himself for examination as provided in sub-section (2) of that section, he shall be notified of the medical advisers selected on the Form "E" of the schedule.

On completion of the examination the said form shall be retained and forwarded by one of the medical advisers to the Board.

The certificate of the medical advisers nominated under sub-section (1) of section *twenty-eight* of the Act shall be made as provided in sub-section (3) of section *twenty-three* in the Form "F" of the schedule.

7. Any person obtaining a certificate under section *twenty-six* of the Act that he is no longer suffering from miners' phthisis shall forward the same within one month from the date thereof to the Secretary of the Board for registration by him and thereafter the certificate shall be returned to such person with an endorsement that it has been so registered.

Note.—Regulations framed under the provisions of this Act with regard to native labourers will be published separately.

There are, of course, various forms to be obtained and filled in, in accordance with the regulations published above. Form A requires information, amongst other matters, regarding trade or employment other than mining previously followed, income, property, or assets in cash or otherwise, life insurance, future intentions, present occupation and rate of remuneration, if unemployed, for how long and why, and present condition of health. Form B asks for statements regarding age, dependent children, income, property or assets, the amount of debts and on what accounts, existing means of support, previous average monthly monetary support from deceased, when last received and references, and future intentions. The order of preference of dependent relations shall be:—The widow, and any son or daughter (legitimate or illegitimate) or stepson or stepdaughter of the deceased miner. The form C, for dependants, other than the widow or widow and children under sixteen, requires information as to age, relationship, occupation, income and earnings per month, knowledge as to length of time passed by deceased in South Africa, property or assets, cash, means of support, previous average monthly monetary support from deceased miner, when last received, and amount, debts, references, and future intentions. "Dependents" shall mean such members of a miner's family specified in the First Schedule of the Act as are wholly or in part dependent upon him for maintenance at the date of his death. The First Schedule is as follows:—The order of preference in which dependents shall have a right to be paid benefits under the Act shall be: (1) The wife, and any son, or daughter (legitimate or illegitimate), or stepson or stepdaughter of the deceased miner; failing whom (2) the father, mother, stepfather or stepmother of deceased miner; failing whom (3) a brother, sister, half-brother, or half-sister of deceased miner and any children of such persons; failing whom (4) a grandfather, grandmother, grandson, or grand-daughter of deceased miner; failing whom (5) any other relative of the deceased miner by consanguinity or affinity. Other forms relate to medical certificates in connection with the Act, and in case of insurance comprise an agreement to have due contributions deducted from wages.

With regard to the payment of compensation in a lump sum, or payment of passage money for the miner and his family to some other country—with a lump sum at the other end of the journey—it may be explained that it is a question on which the Board has absolute discretion. Persons who have received benefits under the old "Allowances Board" are entitled to claim under the new Act, and are in the same position as new men claiming, except that the amounts they have already received will be deducted from the total amounts awarded to them.

Terms of Compensation.

If a miner decides to apply while he has the disease in the early stages, he must satisfy the Board that he has worked here underground for two out of the past five years, or that he actually contracted the disease in these mines. He is then entitled to £8 per month for a period not exceeding twelve months. A miner in the later stages must similarly prove his two years' work or the fact that he contracted the disease in these mines, and he is entitled to £8 per month up to £400—or more under very special circumstances. Dependents have to prove that the deceased miner would have been qualified to receive compensation, and they are entitled to receive up to £400 (less any amount paid to deceased before his death), in the order of preference quoted above.

THE MINERALS OF THE MURCHISON RANGE AND DISTRICT.—VII.

Account of the Haenertsburg and Woodbush Goldfields—Gold-bearing Deposits of the Black Reef Series—An Important Government Report on the Results.

Regarding the condition under which, or the period at which, the ancient workings were originally mined very little evidence is so far available. In conversation with several natives resident at Palabora, including the one after whom April Kop is named, the writer gathered distinctly that in the lifetime of the preceding generation copper-ore was obtained at or near Lulu Kop and smelted for the purpose of currency. Several occurrences suggesting native smelting operations lie along the Selati River in this neighbourhood. The metal was often cast into so-called "maralas" or copper sticks, the peculiar shapes of which have been regarded as possessing a certain sexual significance. These sticks are now very rare in the Low Country and highly prized by the natives; they are still met with occasionally, one being secured by the writer. This evidence does not carry one very far back; it is by no means certain whether the copper-ore was obtained by searching over the old pot-hole dumps or whether the natives mined their supply themselves, while it throws little or no light on the early history of the "reef workings," which can hardly have been due to the labours of South African aboriginals.* Regarded from a more modern economic standpoint, it is very difficult to give a reliable estimate of the possible present value or future prospects of these ancient workings. Situated within the Low Country, they have perhaps suffered for their association with a district enjoying a somewhat unfortunate reputation. No systematic prospecting, as far as the writer is aware, has been carried on at Lulu Kop, and in the presence of so few indications of copper the prospector is not much tempted. The slopes require to be thoroughly cleared of vegetation, and some of the larger potholes, and specially the reef workings, cleaned out and properly examined before a satisfactory estimate can be formed. Past experience, e.g., in the Northern Transvaal and Rhodesia, has certainly demonstrated that it is not well to condemn ancient workings on inadequate *a priori* grounds. 5. *Alluvial Deposits.*—Auriferous deposits in the alluvial form have not as yet assumed any importance in the present district. Some years ago operations on a modest scale were carried out on the Black Reef plateau of the Drakensberg, on the farm Wolkberg No. 2560, where the gold is probably derived from the bankets or conglomerates occurring near the base of the lower quartzite. "The gold-bearing deposit lies along a small spruit draining a dip-slope of grits and bankets of the Black Reef Series, probably corresponding to the horizon of the bankets at the Pennyfather Mine. The gold is derived from the disintegration of the bankets, and has only travelled a short distance from its place of origin. The alluvium consists of four or five feet of rather fine dark soil, one foot of sandy soil and fine gravel, and one to three feet of gravel with occasional boulders up to two feet in diameter, with a compact cement-like matrix."† During 1910 and 1911 more extensive operations along the bed of the M'Thlapitsi River have been in progress, with a view to recovering the alluvial gold on a larger and more comprehensive scale. Near the junction of the Letsitele and Thabina Rivers alluvial deposits of gold are said to occur, but apparently not much attention has hitherto been paid to the possibilities of such stretches of alluvial ground. 6. *Tin Prospects.*—In the account of the Murchison Range given by Mr. Steuart, reference is made to a supposed occurrence of stream tin on the Groot Letaba River; the ore is also reported to have been found along the Murchison Range, but the writer was unable to obtain any definite information. It may be recalled that in the Older Granite there are several localities showing the minerals which often accompany tin in other districts. Tourmaline, apatite, and molybdenite have been mentioned, while scheelite occurs in association with the quartz in the Older Granite at the old Murchison Crown. Elsewhere tin is nearly always associated with tourmaline, and although the converse is not always the rule, the possibility of future tin discoveries in this part of the Low Country cannot be denied. Apparently no systematic prospecting for this purpose has so far been done in the district. Any discovery of tin will probably be preceded by the location of stream or shed tin: in this connection special attention might with advantage be paid to the lower courses of the Melati River or, generally speaking, to those streams, like the Selati and Olifants Rivers, which cut across the junction between the Palabora and the Older Granite. The southern and northern edges of the Murchison Range, which are in contact with the intrusive Older Granite and likewise the margin of the younger Palabora Complex, are suitable prospecting areas in this respect.

Conclusion.

It may be useful, in conclusion, to summarily emphasise a few of the more important and interesting results in connection with the geological structure and economic features of this part of the Low Country, some of which have a wider bearing and more than purely local interest. Regarding the general geology, it has been shown that the Older Granite is intrusive in the schists of the Murchison Range, a conclusion based partly on direct evidence of the occurrence of granitic apophyses veining the schists, and partly on more general evidence derived from the occurrence of metamorphic minerals in the older formations, the distribution of the Older Granite in smaller masses within the schists round Haenertsburg and elsewhere, and, lastly, on the presence of included fragments of the latter in the granite. For these reasons the Murchison Range belt belongs to a formation older than the Witwatersrand System. It has also been shown that a fairly close analogy exists between the schistose rocks of Mount Mare near Pietersburg and those of the Murchison Range. In both areas there are rocks of sedimentary as well as of igneous origin. To the former are assigned banded magnetite quartzites, or calico-rock, sheared conglomerates, and intensely sheared quartzites or quartz-schists—to the latter a varied series of amphibolite, talc, chlorite, and mica schists. The analogy not only covers the broader and most essential features, but is evident also in numerous minor points, such as the presence of tourmaline and several others. In connection with the widespread distribution of granitic and gneissic rocks, a more extended examination of the country between the Olifants and Selati Rivers indicates that from the group of Older Granite and gneisses a younger intrusive series of plutonic rocks must be separated; it has been described as the Palabora Plutonic Complex, a most interesting group of deepseated rocks, ranging from granite through syenites to pyroxenites, which collectively constitute a younger petrographical province not unlike the Bushveld Plutonic Complex; its various members resulted from progressive differentiation of one parent magma. The Palabora Plutonic Complex includes the whole of the Mashishimala belt of granite hills, and its intrusion was attended with metamorphism, as illustrated by the crystalline limestone of Lulu Kop, etc. Very peculiar zenoliths of hybrid rocks were discovered in this connection, which have not hitherto been recorded from South Africa. The important mica-bearing pegmatites south-east of Leydsdorp probably have no genetic connection with the Older Granite, but represent—as the residual mother liquor of the younger magma—the last phase during the consolidation of the Palabora Plutonic Complex. There are some features by which it is possible to distinguish between an older group of pegmatites derived from the earlier granite, and a later group of muscovite-albite-pegmatites, belonging to the younger complex. As regards the economic position of the district, it is specially suited for small enterprises, either for companies with a modest capital or for energetic individuals. Owing to the very uncertain nature of several of the lenticular and other reefs, the patchy and erratic distribution of pay values, and the inherent geological difficulties of prospecting, there is not much room along the Murchison Range for larger enterprises planned on a more ambitious scale. The unfortunate spectacle of so much abandoned machinery and buried hopes may perhaps act as a warning to future prospectors in the Low Country, which is certainly one requiring an exceptional amount of patient prospecting and developing before machinery can be thought of. The fundamental drawback of no efficient transport, which during so many years has dragged back the wheel of industrial progress, is now permanently and effectively disposed of, and there is little doubt that several previously dormant propositions—probably both the promising as well as the doubtful ones—will share in the industrial revival which may reasonably be expected to follow on the completion of the Selati Railway. Incidentally this opening up of the country will have the highly beneficial effect of keeping the local population no longer in comparative isolation under sometimes distinctly unhealthy conditions. It may not be out of place here once more to emphasise the urgent necessity of a comprehensive and permanent water supply for the general purpose of mining development. Though auriferous and other economic deposits have been known for many years in this part of the Low Country, it is surprising how little sysematic prospecting has been done, usually, moreover, along old-established routes, and how difficult it seems for economic investigation to get carried further afield from these. More recently mica has received some attention, but prospecting for corundum and tin is practically unknown, though in both these respects the general outlook is not unfavourable. The opening of the Selati Railway and its extension from Gravelotte westwards through the heart of the "Mist-belt" along the lower slopes of the Drakensberg will undoubtedly prove of far-reaching consequences to local agriculture. It is only necessary to mention the fact that the whole of the remarkably fertile stretch of country round Tzaneen, the entire district of Agatha and Mashutisberg, together with a by no means inconsiderable portion of the Woodbush country, will fall within the beneficial sphere of the new railway to show what an impetus will be given to agricultural development. Permanent and abundant water is everywhere close at hand, the soil is of exceptionally fine quality, and the climate healthy; a good proportion of this highly favoured area, moreover, is Government ground. The above country, more or less co-extensive with the "Mist-belt" region, together with its southerly extension along the foot of the Drakenberg, is the finest stretch of agricultural ground which has come under the writer's notice during the course of some nine years' travelling through various parts of the Transvaal Province.

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* See in this connection a paper by Mr. T. G. Trevor, Inspector of Mines, read in January, 1912, before the C.M.M.Soc., Johannesburg.

† E. T. Mellor *loc. cit.* p. 44.

TRANSVAAL COAL EXPORT TRADE.—II.

Prospects Reviewed—"Fair, with Encouraging Future Possibilities"—Extracts from Mr. Sandilands' Report on the Export of Coal via Delagoa Bay.

The important report made to the Railway Board some time ago, by Mr. Gordon Sandilands, Special Commissioner in the East, has the following, *inter alia*, now for the first time appearing in print:—"My investigations covered the following localities: (1) East Coast of Africa including Aden. (2) Bombay and the North Western Provinces of India. (3) Madras and Southern India. (4) Ceylon. (5) Mauritius and Reunion. (6) Madagascar. [Paragraphs 1, 2 and 3 appeared in our last issue.]

(4) Ceylon.

The nature of the coal market in Ceylon can best be demonstrated by a statement of the distribution of its coal imports. Approximately 500,000 tons are sold to shipping, 50,000 tons to the Government Railway, and 40,000 to 50,000 tons to local industries. Although the market is large it is somewhat difficult to approach because four-fifths of the annual imports are disposed of under bunkering contracts, which are determined in Europe and therefore a permanent outlet for Transvaal coal cannot be expected until the colony's steam coal has established a reputation in the London market. The central situation of Ceylon in respect to Indian, Australian and Japanese fields renders competition for bunkering contracts exceedingly keen, and the vested interests which regular steamship lines have in the countries which they serve would make the introduction of a new coal a matter of some difficulty. The industrial market, too, is closely linked to the shipping market because it partakes of the nature of a retail trade and its volume is often affected by the sale of a damaged cargo. For some time to come the annual Government Railway contract is likely to be the chief matter of interest to colliery owners in the Transvaal. The market, however, is worth striving for because of its permanency when once a good footing is secured.

(5) Mauritius and Reunion.

The quantitive value of the Mauritius market may be taken at 45,000 tons annually. Approximately half of this quantity is consumed by the Government Railway, whose requirements are arranged for by public tender, while the other half goes into the planters' market, which is an open one throughout the year. Notwithstanding the relative proximity of Mauritius to South Africa, it is remarkable that more than half of its coal requirements until now have been drawn from the United Kingdom. The largest individual consumer is the Government Railway, and it is instructive to note that after one year's trial of Natal coal the Administration was prepared to wholly condemn all South African coals, and to do so not because of poor quality, but because certain two collieries in Natal were unable to maintain a uniform grade of coal. No stronger proof could be adduced of the necessity for concerted action among Transvaal colliery owners in regard to the export trade than this fact, namely, that Natal coal secured a Government Railway contract in Ceylon and simultaneously lost one in Mauritius. Had a standard quality been exported both contracts might have been retained. In the planter's market both Natal and Transvaal coal have been favourably received. The shares to be secured by the rival colonial coals will depend almost wholly upon the relative shipping facilities between Port Louis and the two coaling ports of Durban and Lourenco Marques. At present the advantages seem to lie with Natal. The island of Reunion, although almost equal to Mauritius in size, offers fewer attractions to the coal salesman. The local market is of much the same character but unfortunately the French colonial administration compels Government institution to buy only the product of the Motherland, consequently only briquettes of French manufacture are used on the Government Railway. The planters' market is small, and its demands hardly exceed 4,000 tons per annum. Reunion, however, is a bunkering port for two lines of French steamers and their requirements, amounting to probably 1,000 tons per mensem, ought to fall to the South African fields provided that the quality of its coal is sufficiently good to warrant its use by mail steamers. In the future Reunion may furnish an outlet for 15,000 to 20,000 tons per annum. The local business is very restricted, hardly amounting to 4,000 tons annually, since all shipping requirements are arranged for in France.

(6) Madagascar.

The prospects of opening up a coal trade with this French colony are at present somewhat remote. The island has recently emerged from a state of semi-barbarism and has not developed any industries which require the use of power. The use of coal for domestic purposes is unknown, and wood fuel is cheap and plentiful. The only likely clients for Transvaal coal will be found among the shipping companies. With the exception of the railway, which, from motives of policy, buys about 2,000 tons of Natal coal annually, there is no demand whatever in Madagascar. Notwithstanding this state of affairs the colony of Natal is able to find an outlet in Madagascar for about a thousand tons a month. This quantity represents the requirements of a small private French steamship company (Compagnie d'Armament Coloniales), whose two steamers ply between Tulsar and Durban. The subsidy afforded to this particular company by the French Colonial Government takes the form of return freight, and for this reason only has an artificial demand for coal by the Government railway been created. The present Governor-General (M. Auganeur) professes a desire to open up trade with Lourenco Marques, chiefly with the object of selling Madagascar cattle. An embargo, however, exists upon their importation to that port, but were this removed or modified sufficiently to allow of the French Colonial Company's steamers calling there, the Transvaal collieries would assuredly benefit. The colony of Madagascar is served by two regular lines of steamers (Messageries Maritimes and Compagnie Havraise), both of which maintain coaling depôts there. The French Admiralty also maintains a large stock of French briquettes at Diego Suarez. I estimate that the present coal requirements by shipping round Madagascar cannot fall far short of 24,000 tons per annum. A considerable portion of this trade ought by rights to fall to the coalfields of South Africa, provided always that their coal is of sufficiently good quality. The position affords occasion for the services of a London representative, since all the coaling contracts of shipping lines are effected in Europe. Madagascar, like Reunion, may be described as a market of no present value, but possessing certain possibilities.

To summarise:—The immediate prospects are fair and the future possibilities even more encouraging. An export trade to the east of from 100,000 to 240,000 tons annually might be established. The growing industrial development in Western India warrants the assumption that the above estimate may be ultimately exceeded. A standard quality of round coal, guaranteed either by Government or by a recognised public institution of world-wide repute is essential. Distant consumers will not contract with individual concerns but will always demand guarantees for quality and regular supplies. The present Bombay market prices necessitate an approximate price of 18s. per long ton C.I.F. ports of entry. Until Transvaal coal has secured a sound footing in the eastern markets colliery owners should not expect more than a bare margin of profit per ton.

ACCIDENTS IN TRANSVAAL MINES, WITH SPECIAL REFERENCE TO FALLS OF GROUND.—II.

"A Stream With Many Tributaries"—Mr. James Chilton's Reply to Discussion—Critics Answered—Is the Rate Excessive and Unwarranted?—Underground Discipline—Effects of Changes and "Hustle"—Valuable Conclusions.

Mr. Vaughan speaks of the difficulty of proving to a magistrate that certain systems of mining are dangerous and should be stopped. Surely the time has come when a mining magistrate should be appointed to try all serious charges under the mining regulations. Against our present magistracy the author has not one word to say. Their decisions usually carry the approval of all moderate men, but no one can deny their inability to give satisfaction in mining cases. It is no disparagement of their legal knowledge to say that they are entirely at sea when dealing with mining actions. The technical language, the uncouth mining terms, the contradictions of experts, and the excursions into underground literature all tend to confuse the issue, and if by a happy chance the magistrate give a correct verdict, both prosecutor and defendant are so worn out with the law's delays, the frequent adjournments, and the wasted time, that the former vows he will never bring forward another case, and the latter decides that next time he will plead guilty whatever the charge. It is not enough to have a public prosecutor who understands mining, we should also have a magistrate. On questions of law he could be advised by the clerk of the court, on questions of fact and mining procedure he ought to be so well versed that he could save both the time and the temper of mining litigants.

Mr. Vaughan, after declaring that systematic timbering would not be satisfactory, concedes the point aimed at when he admits "that timber should be used more freely than it is now." This is the crux of the argument, more timber arranged on a definite plan or system. If timbering is left entirely to the stoper he invariably chooses a place where he has a natural head, and hitch, regardless of the fact that timber is intended to secure safety. If arranged on some well-thought out method, timber would have to be set at definite distances and the old "prop where you like" system would be abolished. The drawing of timber from worked out areas has not been tried—so far as the writer knows—in this district, but the objections to the practice are not insuperable, and the recovery of timber from old stopes will be one of the future innovations on the Rand.

Mr. Vaughan's penultimate paragraph compresses the whole of my paper into three lines when he says: "No one will contend that the natural dangers on the mines of the Witwatersrand are so great that they cannot be surmounted with care and skill." Such an expression of conviction from a cautious, experienced Inspector of Mines such as Mr. Vaughan is, is not one of the least points of interest that this paper has brought forth.

Mr. J. Moyle Phillip's long paper on general mining is interesting, but only bears slightly on the subject of accidents in mines. He has come to the conclusion that as far as safety measures are concerned we have not progressed at all in five years. While admitting that safety measures are still not receiving that consideration which they demand, the author sees some evidence of the progress that is being made along various lines to secure the safety and health of the underground employees, and in this fight our Society has played a not ignoble part. Miners' phthisis, originally an obscure disease, has been brought forth into the light, its causation and prevention has received attention from the highest scientific authorities, and measures have been adopted that bid fair to make this disease as rare as the Black Death. In our mines miles of water pipes have been installed and millions of gallons of water are being sent down to allay the deadly dust, and sprays, respirators, atomisers, hoses, and sprinklers are being used to accomplish the same desirable end. In the matter of miners' phthisis we have undoubtedly progressed, nor is our advancement limited to this subject only. Mine ventilation has received attention, and the huge fans that have been installed in many of our mines will have a considerable effect upon the accident rate, for no person can give his attention to safety measures if his brain is dazed and clouded by breathing in a vitiated atmosphere. Pure air may primarily be an efficiency measure, but it reacts upon safety conditions and tends to produce that mental alertness that is so desirable in underground workers. Sanitation and first aid appliances have not escaped consideration, and in these a great improvement is noticeable. In mining methods we find that back stoping and raising are being frowned upon in high technical circles, because of their dust-producing tendency, and all through there is evidence of the wish to ameliorate mining conditions. All these improvements have been made in the five years mentioned by Mr. Moyle Phillips, and though we have not yet reached the Golden Age of mining, yet this Society will keep on pointing out where improvements could be made, though the results may not be seen till after many days.

Mr. M. H. Coombe speaks of the difficulty of enforcing discipline underground, and there can be no doubt that underground discipline is becoming slacker year by year. Our native worker has become so flattered by wily recruiting agents and so pampered by indulgent compound managers that the task of getting a fair day's work out of him is almost impossible. Unlike the white worker he has no dread of dismissal or disgrace. In many of our mines if a native simply puts in an appearance at his working place he must be given a wage ticket. Orders given for his safety he disregards in the most light-hearted fashion, and if any miner backs up his command by physical force he is promptly haled before a magistrate, and fined. No person wishes to encourage brutality underground, but between brutality and namby-pambyism there is a long stretch of neutral ground. There is probably more corporal punishment administered in an English public school in one week than occurs in a Rand mine in a year. What in the English schoolmaster is necessary discipline becomes callous brutality when performed by a Rand miner. Fines and imprisonment have little effect on the native mind; in fact a long term of imprisonment is looked upon as a romantic episode in an otherwise prosaic occupation. Lack of discipline underground undoubtedly is the prolific mother of accident, and unless the miner has the power to compel obedience, this cause seems likely to neutralise efforts put forth in other directions.

From such a master of safety measures as Mr. W. Cullen we expected an enlightening contribution and we were not disappointed. Visitors to the dynamite factory always come away impressed by the extreme measures to secure safety that obtain there, and the remarkable freedom from accident enjoyed by the Modderfontein factory presents some features that might be copied by the mining industry with profit to themselves and safety to their employees.

Mr. Cullen thinks that a comparison between black and white death rates would be instructive and interesting and it originally was the author's intention to include a table giving these rates, but after much thought on the subject he decided that as fatal accidents bring both white and black down to a common basis, and that death levels all distinctions, little good would result from their separation. The author hopes that in breadth of vision this Society has got somewhat beyond the stage reached by the Royal Society of England in 1800, which, without a trace of irony, records an accident which not only killed twelve miners, but even "caused the death of a gentleman of quality." However, as a demand has been made for its production, the author supplies it, as it may remove some false impressions, and will correct an idea that seems prevalent amongst our non-mining population, viz., that the native accident rate far exceeds the European rate.

Death Rate per 1,000 Employees.

	Whites.	Coloured.	Chinese.
1905	4.01	5.32	6.82
1906	4.27	4.21	6.00
1907	3.41	3.92	5.76
1908	3.98	5.43	5.66
1909	3.49	4.40	3.76
1910	2.81	4.09	...

From the above table it will be seen that the "ignorant savage" is only slightly inferior to the civilised European in his ability to escape the dangers of mining life, and that the mining Moloch demands an almost equal number of white and black victims. It also shows that the charge often brought against white miners that they ask native assistants to perform duties which they themselves think too hazardous is based upon scanty facts.

Mr. W. Cullen and Dr. D. Macaulay raise the question of the frequent changing of both managers and miners, and consider that the practice helps to swell the accident rate. No student of our mining conditions can have failed to notice the alarming frequency of these changes and their disastrous effect in a great many cases. While it is admitted that both managers and men may outlive their usefulness, it cannot be denied that excessive change breeds half-heartedness, inefficiency and accident. Men are supposed to shift because they may; managers because they must. . . . . Restlessness and change are factors that must be considered when inquiring into our accident rate, for as Dr. Macaulay points out, they do not make for industrial efficiency, nor political stability nor mining safety. The author regrets his inability to reply to all the points raised on the discussion of this paper. To reply adequately would need a whole volume, for some of the criticisms were longer and probably more valuable than the original paper. In summing up the discussion it is apparent that there is no royal road to the prevention of accidents, for the river of accident is a stream having many tributaries. Probably the following conclusions will represent the verdict of the majority that have joined in the discussion:—That the accident rate in the Transvaal Mines is excessive. That nothing in our local conditions warrants this rate. That underground discipline needs strengthening. That further regulations are unnecessary. That deep levels are more dangerous than outcrops. That mine changes effect the accident rate. That "hustle" produces accidents. That safety and efficiency on the mines are not incompatible.

UNION MINING STATISTICS FOR JUNE.

Gold, Silver and Coal Production—Development Returns—Accidents and Explosive Figures.

The following are the usual monthly returns, compiled and issued by the Government Mining Engineer's Department, of the prinicpal statistics relating to the mineral production of the Transvaal and the Union.

Total value of mineral output, gold, silver coal, and other metals and minerals, excluding diamonds, for June is £3,434,180.

THE GOLD PRODUCTION.

For June the Government returns of the gold output of the Transvaal record a total of 751,680,661 ozs. of fine gold of a value of £3,205,678, the contribution from other Provinces being 165.35 ozs., value £702. The Government's return for the Witwatersrand is 732.216.631 ozs., value £3,072,029, against the Chamber's declaration of 722,588 ozs., value £3,069,560, which is less by 629 ozs., value £2,669, than the Government figures. For the outside districts the Government analysis gives 31,464.03 ozs., value £133,649, against the Chamber's figures of 31.348 ozs., value £133,157; the difference in this case being 116 ozs., value £492, less than the figures shown by the Chamber. The number of mines dropping stamps on the Witwatersrand is given as 60, while the Chamber shows 56 companies making returns besides gold recovered by miscellaneous producers. In the number of mines milling in respect of what are termed outside districts, the Chamber's analysis shows two mines producing gold at Heidelberg, four at Barberton, and two at Lydenburg, besides miscellaneous producers, while the Mines Department shows four for Heidelberg, four for Klerksdorp, one for Ottoshoop, thirteen for Barberton, twelve for Pilgrim's Rest, and two at Pietersburg. The total number of all mines crushing is 96. Cape returned 1.35 ozs., value £5, from alluvial, and Natal returned 164 ozs., valued at £697, from two contributors. In addition, there are 43 mines, works, and gold-producing concerns returning gold not included in the above total. The number of stamps dropping is given for the Rand at 9,515, for Heidelberg 130, for Klerksdorp 70, for Ottoshoop 10, for Barberton 264, for Pilgrim's Rest 155, and for Pietersburg 15, making a total of 10,159. The number of tube mills operating on the Rand was 260, Heidelberg district 2, Klerksdorp district 2, Barberton 1, and Pilgrim's Rest 4, the total for the Transvaal being 269.

	Ozs.	Value. £
Witwatersrand	723,216.631	3,072.029
Outside districts—		
Heidelberg...	7,192.000	30,550
Klerksdorp	2,550.394	10,833
Ottoshoop	83.200	353
Barberton	7,940.170	33.728
Pilgrim's Rest...	13,434.886	57,067
Pietersburg	263.380	1,118
	754,680.661	3,205,678
Cape	1.350	5
Natal...	164.000	697
	754,816.011	3,206,380

In the detail of sorting the system of tabulation sets out that the producing mines on the Rand sorted out during June 12.73 per cent. of the tonnage mined as against 13.18 for May, 12.87 for April, 12.88 for March, 10.03 for February, and 12.76 for January. The tonnage milled on the Rand amounted to 2,121,075 tons and for the whole of the Transvaal 2,193,254.

ROCK DRILLS.

The average number of machine drills in use in the gold mines during each month for the past thirteen months was :—

1911—	
June	4,286
July	4,329
August	4.412
September	4,417
October	4.589
November	4,653
December	4,671
1912—	
January	4.791
February	4,761
March	4.689
April	4,665
May	4.951
June	5,322

of which 5,244 were on the Rand, 45 at Heidelberg, 16 at Klerksdorp, and 17 at Barberton.

DEVELOPMENT.

For all districts the figures for ore handled and treated during June are :—

	Rock Hoisted. Tons.	Rock Milled. Tons.
Witwatersrand	2,449,802	2,121,075
Heidelberg	24,055	18,956
Klerksdorp	12,777	9,584
Ottoshoop	415	395
Barberton...	24,725	19,231
Pilgrim's Rest	23,461	23,654
Pietersburg	599	359
	2,455,714	2,193,254

The number of feet driven on development on main drives and crosscuts was :—On the Rand 39,642, and in outside districts 10,565. On main shaft sinking on the Rand a total of 3,878 feet in depth was attained, and in outside districts 590 feet. Other development on the Rand accounted for 25,745 feet, and in outside districts 1,683 feet.

FINE SILVER DECLARED.

The returns of fine silver produced begin from the commencement of the statistical year, July 1, 1902. The declared weight and value are appended :—

	Ounces Fine Silver.	Value. £
Statistical year, 1902-3	280,997,219	29,215
Statistical year, 1903-4	406,676.944	45,111
Statistical year, 1904-5	476,085.975	54,221
Statistical year, 1905-6	574,485.878	70,704
Statistical year, 1906-7	690,731.853	92,874
Statistical year, 1908-9	798,316.556	84,686
Statistical year, 1909-10	801,657.721	85,807
June-December, 1910		55,650
Year 1911		98,507

1912—

	£
January	8,735
February	8,321
March	9,291
April	9,525
May	9,619
June	9,536

COAL PRODUCTION.

The number of mines producing coal in the Transvaal is returned at 33. The quantity sold was 375,868 tons for the month, which shows a decrease of 46,976 tons as compared with the previous month. The total value of the coal at the pit's mouth is given at £82,489, which is a decrease of £10,452.

The details of the production for June are :

	No. of Collieries.	Tons sold.	Value. £	Value per ton. s.	d.
Springs	5	48,133	12,778	5	3.71
Middelburg	15	288,292	62,351	4	3.91
Other districts	13	39,443	7,360	3	8.78
	33	375,868	82,489	4	4.67

The percentage of waste sorted out was 15.7.

UNION RETURNS.

	Coll.	Tons. sold.	Value. £	Value per Ton s.	d.
Cape	8	6,090	3.534	11	7.27
O.F.S.	5	42,896	11,921	5	6.7
Natal	19	213.128	60.110	5	7.69
Transvaal	33	375.868	82,489	4	4.67
Totals	65	637,982	158.054		

COPPER.

The output of marketable produce for June was :

	Tons.	Pure metal per cent.	Tons.	Value shipped.
Transvaal	130.41	49.2	94.25	£3,715
Cape	1,266.00	51.27		
	1,296.41		94.25	£3,175

TIN.

The marketable output of tin for June was:

	Tons.	Pure metal per cent.	Tons.	Value shipped.
Transvaal	279.076	62.67		£42,643

OTHER MINERALS.

Minerals other than gold, coal, copper, and tin for June were:

TRANSVAAL.

Mineral.	Tons.	Value.
Graphite	1.989	£68
Lead	71.4	699
Lime	5,787.000	9,781
Flint	142.000	932
Miscellaneous	3.000	350
	Ozs.	
Silver in gold bullion	80,186.934	£9,340
Silver in other minerals	1,960.000	196

UNION OF SOUTH AFRICA.

Minerals.	Tons.	Value.
Asbestos	128.000	£1,808
Graphite	1.989	68
Lead	71.4	699
Lime	6.094.000	10.475
Flint	142.000	932
Miscellaneous	3.000	350

TOTAL MINERAL OUTPUT.

Gold, £3,206,380; silver, £9,536; coal, £158,054; base metals, £60,150; total, £3,434.120.

ACCIDENTS.

From the table of accidents the following extracts are reproduced, the total number of separate accidents for June being 237 for the Transvaal, and for the Union of South Africa 271. The accident figures for the Transvaal are for the past thirteen months:

		Killed.			Injured.	
1912.	Separate Accidents.	White.	Coloured		White.	Coloured.
January	105	3	59	...	33	149
February	216	7	70	...	25	161
March	234	4	85	...	33	165
April	203	3	51	...	24	160
May	218	5	69	...	22	163
June	237	3	66	...	24	199

EXPLOSIVES.

Appended is a summary of the statement showing the quantity of explosives manufactured during June:—Transvaal, 21,139 cases; Cape, 33.317 cases; Natal, 19,608 cases; total, 74,064 cases.

Official Labour Statistics for June.

The following figures supplied by the Government Mines Department show the total number of persons in the service of companies and companies' contractors in the Transvaal and Union, but do not include a certain number of coloured convicts employed on the Witwatersrand area:—

GOLD MINES.

	White.	Coloured.
Witwatersrand	23.975	196,645
Heidelberg	232	2,743
Klerksdorp	93	911
Ottoshoop	6	84
Barberton	271	3,265
Pilgrim's Rest	285	4,633
Pietersburg	20	256
	24,885	208.537

The total for coloured labour on the Witwatersrand does not include 590 coloured convicts.

YEAR'S PROGRESS.

The following table of numbers actually in the employ of companies and companies' contractors shows the progress of labour for the whole Transvaal for the last thirteen months:—

	Gold Mines.		All Mines.	
	White.	Coloured.	White.	Coloured.
1911—				
June	25,960	206,197	27,850	233,598
July	25,780	201,485	27,668	229,071
August	25,632	198,332	27,521	225,105
September	25,431	196,421	27,332	224,084
October	25,329	196,019	27,214	223,171
November	25,157	195,073	27,033	221,113
December	25,114	194,336	26,978	218,811
1912.				
January	25,224	198,595	27,116	223,227
February	25,212	204,923	27,146	231,459
March	25,151	211,592	27,130	239,861
April	24,906	215,148	26,907	245,642
May	24,921	213,522	26.946	245,612
June	24,885	208,537	26,961	244.586

Grand total of the numbers in service of Transvaal Mines, 268.549.

UNION TOTALS

	White.	Coloured.
Transvaal ...	26.961	241.588
Cape	2.926	18.783
Orange Free State	1,221	12.198
Natal	517	10,196
	31,625	283,065

Apex Mines.

The report of the Apex Mines, Ltd., for the quarter ended 30th June, 1912, states: Gold Section: North Shaft: Main Incline: There was no sinking in this shaft. Development: The footage driven, risen and sunk was 5,650 feet, made up as follows: Driving on Main Reef, 3,840 feet; rising, 574 feet; sinking, 520 feet; boxhole rises (to fully expose reef), 625 feet; various, 91 feet. 2,415 feet were sampled on Main Reef, with the following results:

	Feet Sampled.		Reef Width. Inches.		Reef Value. Dwts.
Payable	945	......	56·98	......	6·14
Unpayable ...	1,470	......	28·30	......	3·31

The ore reserves on a milling basis as at 30th June, 1912, are estimated to be as follows:

	Milling. Tons.		Milling. Width Inches.		Milling. Value Dwts.
Payable ...	450,002	......	53·92	......	6·34
Unpayable ...	140,650	......	45·42	......	2·52

South Shaft: No work has been done at this shaft during the quarter. The net capital expenditure during the quarter on the gold section of the company's property on capital account was £35,027. Coal Section: The tonnage of coal disposed of was 53,302 tons, the profit being estimated at £9,000.

The death has occurred at Klerksdorp, from miners' phthisis, of Mr. W. J. Roberts, who, during the stope drill competition, was in charge of the Gordon drills at the Ferreira. He had previous to the war worked in that district, and in the latter part of 1909 came to the Afrikander property, since the closing down of which he had been employed at Warren Hill.

High Mining Salaries

EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individnal Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings; Box 2061.

Rhodesian Section.

LATEST MINING NEWS.

The June Output—New Clifton Gold Mines—The Rezende Power Station—Bwana M'Kubwa—New Found Out—The Cam and Motor—Giant Geology—The Champion Mine.

The output of gold for the month of June was declared on Monday last at 53,874·90 ozs., valued at £226,867, being a decrease of 1,789·06 ozs. in weight and £7,540 in value as compared with the longer month of May. The increase as compared with the corresponding month of last year is 2,784 ozs., while the total for the first six months of the present year is no less than 7,768 ozs. in advance of that for the first six months of 1911. The total value of the gold and mineral outputs for the month under review was £248,909, which was made up as follows, the figures for May being given for purposes of comparison:—

	May.	*June.*
Gold	£234,407	£226,867
Silver	1,696	1,826
Lead	729	5,928
Chrome iron ...	4,375	13,750
Coal (sales) ...	5,336	5,538
Totals	£246,543	£248,909

It will be seen from the foregoing that the increased output of chrome iron ore was responsible for wiping out the deficiency in the gold yield and for causing the total mineral yield to be £2,366 higher than that for the month of May. Taking it all round the output may be said to be satisfactory. It had been expected, in view of the drought, to have seen the positon a good deal worse than it is, and no doubt the pinch will be felt later on in a more marked degree. The output is already far in advance of last year's total, while there appears to be no sign of falling off in activity in the Hartley and Bulawayo districts. Satisfactory development news continues to reach us from Bembesi, Gatooma, Umvuma, and Umtali, and the output list above gives proof that the country is preparing, if it is not already prepared, to respond handsomely to any indication on the part of capitalists of renewed interest.

* * * *

At the statutory meeting of the New Clifton Gold Mining and Development Company, which was held in Salisbury on Tuesday week, the directors presented a report which was in every way satisfactory. It states that the total number of shares issued is 124,207, of which 50,000 were allotted, credited as fully paid, in part consideration for the properties acquired. Upon the remaining shares the sum of 5s. per share has been paid, with the exception of 1,900, upon which £237 10s. is still owing. The total amount of cash received is £18,312 10s., which has been disposed of as follows: The preliminary expenses amounted to £458 3s., and the purchase price of the properties acquired, payable in cash, absorbed £12,500. Some £3,500 or thereabouts have been expended on development, etc., and the company's credit balance at the bank on the day before the meeting was £2,188 8s. 8d. It is further stated that the amount of development work done since the transfer of the claims to the company totals over 1,200 feet, and, in addition to this footage, new headgears have been erected, and rails and machinery, which had been taken up and dismantled by the old company, have been relaid and replaced. The results of the six months' work also seems to be most satisfactory, no less than 5,000 tons of ore being ready for the mill, which, it is hoped, will start running before the end of the present month.

* * * *

The official opening of the new Rezende Power Station took place last Monday in the presence of a large gathering, among which were the heads of the various departments of the Rezende and Penhalonga mines. The party proceeded first to the old power station, where a general explanation of the plant took place, an open-air luncheon following. A move was then made along the pipe line to the new generating station itself. Mr. R. W. Robinson, after referring to Mr. Jameson's absence, spoke of the workmanlike way in which everything had been put together, making special mention of the excellent work of Mr. H. Wragg (the engineer in charge). Mrs. W. E. Parker was then asked to turn the water into the Pelton wheels and so open the new plant. Mrs. Parker at the same time proposed a long life of useful work for the machinery, and the health of Mr. Wragg and his staff. A suitable reply to the toast was given by Mr. Wragg, who informed the assembly that they had that day seen the inauguration of both the largest and the most up-to-date plant in South Africa for the generation of electricity by water power. Mr. Spencer Cavendish afterwards proposed the health of the Rezende Mines, Ltd., to which Mr. Parker suitably responded.

* * * *

An official statement issued by the Bwana M'Kubwa Copper Company in mail week stated: "The first consignment of the plant for ore treatment has been shipped. In view of the large amount of ore reserves development work has been suspended to permit of the main hauling shaft being prepared for output."

* * * *

Cable from the New Found Out: "East crosscut off north drive No. 7 level, sulphide ore exposed; average width is 6 feet, average value is 18 dwts. Now driving north on lode. No. 7 level, reef averages 5 feet wide (throughout), and No. 7 level already 8 feet longer than No. 6 level, face continuing in ore (both) north and south, average assay value 13 dwts. North drive for the last 11 feet average width is 5 feet, average value is 15½ dwts."

* * * *

The following extract is taken from a report which has been sent by mail from the Cam and Motor property to the board in London: Motor Mine—No. 5 level: The last two crosscuts put in from the main south drive at 255 feet and 305 feet south of main crosscut have exposed a substantial width of highly-payable ore. The total width exposed in the crosscut 255 feet south is 37 feet of an average value of 11·4 dwts., and so far in the crosscut 305 feet south a width of 15 feet of an average value of 23·9 dwts.

* * * *

During the early part of mail week the London Board of the Giant Mines received a cablegram from the consulting engineer stating that Dr. Corstorphine endorses the views expressed in the cable published on June 7th, viz., that the encountering of the acid dyke and mineralised matter in Nos. 3 and 7 boreholes can be regarded as most satisfactory. Subsequently the following cable was received: "Struck quartz and mineralised rock in the No. 8A borehole at 323 feet; to all appearances like rock on the footwall side of the lode No. 6 level. Borehole down 397 feet; continuing sinking. For the last 70 feet core shows traces of gold; consider results give every encouragement."

* * * *

A report from Umtali states that development on the Champion mine, belonging to the Amalgamated Properties of Rhodesia, Ltd., is giving very satisfactory results. In the new main shaft, east, at the 150 feet level about 1,000 feet of driving has been done, and a winze has been put down on the reef for a distance of 60 feet. Quite recently the old west shaft, which is in the centre of a very large old working, has been dewatered and repaired, and is now in use.

* * * *

The development work carried out at the Shamva mine to date has demonstrated this to be the largest and most important mining proposition in Rhodesia, and in view of this the present position and prospects of the mine call for more detailed examination than has as yet been accorded it. The issued capital of the company amounts to £500,000 in £1 shares, and with these at £3 1s. 3d. the present market valuation of the company is about £1,530,000. An opinion which has very generally been held and expressed in regard to the Shamva is that, although the deposit is admittedly a large one, the development and equipment of the mine on bases commensurate with the property's low-grade possibilities will call for a vast amount of capital, and will rule the proposition out of the list of producers for some years to come. The reports of the directors, of Mr. H. A. Piper, the company's consulting engineer, and the statement made by the chairman at the meeting held in London the other day put a very different complexion on affairs. Out of the mass of important facts and figures presented by the chairman, the directors and the consulting engineer, four stand out above all others. They are as follows and are of such importance that we make no apology for further alluding to them: (1) At the date of the meeting held in London, four weeks ago, there were 2,142,000 tons of nearly 5 dwts. value developed. (2) The mine will be crushing in a year from date. (3) At the end of 1911 the company had cash in hand amounting to over £290,000. (4) The new plant will have a treatment capacity of from 40,000 to 50,000 tons per month. The ore is, of course, of low-grade value, but it should be borne in mind that Mr. H. A. Piper, the company's consulting engineer, has acted with his usual conservatism, both in his estimates of tonnage and value. Furthermore, the mine lends itself to cheap working on account of the great width of reef. Summarising the particulars as to developments on the different levels, the following figures as to thickness of deposit are of much interest:

	Average width of ore body.
" Prospect " level crosscuts	88 feet.
First level	10 feet.
Second level	97 feet.
Third level crosscuts	29 feet.

As bearing, too, on the question of working expenditure, it is of particular interest to note that 25,821 tons were broken in an open-cast stope at a cost of 1s. 2·7d. per ton, despite the facts that the worst labour was utilised, the stopes were not in good shape for the breaking, and all ore was broken by hand. The size of the new plant demonstrates the soundness of the development policy carried out, as even on a crushing basis of 50,000 tons per month the payable reserves at present blocked out are sufficient to keep the mill employed for between three and four years. These facts and figures should serve to allay any anxiety that may have existed as to the future of this great mine. It is clear that the Abercorn property will, without any further severe financial impositions, be crushing at an early date and at the rate of not less than half a million " profitable " tons per annum.

Eldorado Banket.

Mr. R. G. Fricker, presiding at the meeting of the Eldorado Banket Gold Mine, declared that he did not share the anxiety which had been frequently expressed regarding the mine's future. He explained that the decrease in the ore reserves was not due to any suspension of development work, but was mainly owing to a good deal of ore being cut off by a fault on the eighth level.

Wanderer (Selukwe).

The Wanderer (Selukwe) Gold Mines, Ltd., report for 1911 shows that a profit of £7,962 was secured, and this will be carried forward. The grade of ore from the Camperdown Mine has fallen materially, and this is solely responsible for the comparatively poor results. The manager is not very hopeful of this property, for after mentioning that 125,766 tons of ore were extracted during the past year, he remarks: " In view of the unfavourable developments this is on a greater scale than it can be expected to do in the future." The ore reserves in the five mines are stated to be 350,000 tons, and as 220,000 tons are mined annually, the tonnage in sight will keep the plant running eighteen months. A change in the management has been effected, and it is probable that under the technical supervision of Mr. Noel Griffin a reduction in working costs will be made.

Lomah Stoessel Banket.

The directors' report of the Lomah Stoessel Banket (Rhodesia) for the fifteen months to May 31, 1912, shows that development of the principal interests has so far met its marked success, special prominence being given to the Mapske Mines, Tivoid Claims, and Kambanje Claims. It is also proposed to change the title of the company to " Lomah (Rhodesia) Exploration Company."

Companies in Liquidation.

New Orion Mijnpacht Gold Mining Syndicate Ltd., The (voluntary); a meeting will be held in Stock Exchange Buildings, Johannesburg, on August 22nd. J. H. L. Manisty, liquidator.

Main Reef Exploration Syndicate, Ltd. The; a general meeting will be held at 86, Johannesburg Stock Exchange Buildings, Fox Street, Johannesburg, August 6th. J. H. Rainier, liquidator.

Potchefstroom Breweries, Ltd.; a meeting will be held at 15, Natal Bank Buildings, Market Street, Johannesburg, on July 26th. F. M. Edwards, liquidator.

Draaikraal Syndicate, Ltd. (voluntary); a meeting will be held at Bettelheim Buildings, Johannesburg, on August 6th; Henry Taylor, liquidator.

Edwards, Ltd.; first and final liquidation account and plan of distribution, Master's Office, Pretoria, and A.R.M.'s Office, Johannesburg, for 14 days from July 17th.

British Bechuanaland Diamonds, Ltd.,; a general meeting will be held at 5, Corporation Buildings, Rissik Street, Johannesburg, on August 13th. Francis Becker, liquidator.

Vogelstruisfontein Gold Mining and Development Syndicate, Ltd., The; a general meeting will be held at 100, Stock Exchange Buildings, Johannesburg, on August 13th.

G. E. M. Exploration Syndicate, Ltd.; a general meeting will be held at Harrison Street, Johannesburg, on August 13th. H. Williams, liquidator.

Haugregil Gold Mining Co., Ltd.; a meeting will be held on July 24th, at the office of E. W. Nash, liquidator, at Pilgrim's Rest.

Kaffir Tin Development Co., Ltd.; a general meeting will be held at Harrison Street, Johannesburg, on August 13th. H. Williams, liquidator.

Welgelegen Diamond Mining Co., Ltd., The; a general meeting will be held at No. 107, Exploration Buildings, Commissioner Street, Johannesburg, on August 15th.

Martin Patent Furnace and Gold Extracting Co., Ltd., The; a meeting will be held at the Savings Bank Buildings, Capetown, on August 20th. Saul Thomson and R. E. Ball, joint liquidators.

Specimen copies of the *S.A. Mining Journal* can be had from our new offices at 125, Salisbury House, London Wall, E.C.

RHODESIAN MINERAL OUTPUT FOR JUNE.

Gold Output £226,867—Total Output £248,910—A Further Advance Recorded.

The following is the official return, as supplied by the Rhodesia Chamber of Mines (Incorporated) of the mineral output for the month of June, 1912 (the total value of the output for the preceding month was £246,543):—

GOLD.

Note.—All the declarations are in fine gold.

MATABELELAND.

Bulawayo.—	No. of Stamps.	Tons Treated	Yield Ozs.	Value £
Agincourt (Est. S. Roodt, deceased)	5	632	520·92	2188
Alice, Atlas, & Andersons (R. Barkley)	10	1563	498·38	2093
Aln (W. H. Robinson)	2	74	26·84	113
Do. (tailings)	—	156	32·74	137
Antenior (W. J. Lane)	2	180	83·24	350
Do. (tailings)	—	60	12·48	52
Bengali (Hicks & Arbery)	5	411	104·67	440
Do. (tailings)	—	225	14·09	59
Berwick (Rhodesia, Ltd.)	6	601	350·22	1471
Do. (tailings)	—	301	114·76	482
Do. (slimes)	—	280	128·07	538
Big Ben (W. E. Hunt)	4	203	180·76	759
Blanket (Forbes Rhod Synd.)	15	207	47·50	199
Bucks Reef G.M.Co., Ltd.	5	843	579·87	2135
Do. (tailings)	—	580	138·35	581
Bulawayo Main A. (R. A. Myburgh) (tailings)	—	1075	54·17	227
Burton (W. Holmes)	5	490	82·16	345
Bushtick Mines, Ltd. (tailings)	—	1582	336·94	1415
Do. (slimes)	—	432	48·87	205
"C" (C. & D. Synd.)	10 IC	2503	139·14	584
Do. (tailings)	—	1940	176·55	742
Do. (slimes)	—	563	154·47	649
Central D.B. (Est. F. C. Smith, deceased) clean-up	—	—	7·06	30
Claremont Mines (Rhod.), Ltd.	20	2619	822·94	3456
Cumberland (Belingwe G.M. Synd.)	5	100	89·06	374
Eagle A (Peard & Macdonald & Co.)	5	484	166·42	699
Do. (tailings)	—	216	31·24	144
East Gwanda Mines, Ltd., Geelong (W. Hogg,) April	15	1500	300·71	1263
Ella's (D. Vincent)	5	300	33·19	139
Glen (A. Fraser)	3	166	33·31	140
Intabanenda 2 S. (Estate of B. Smallie, deceased)	5	135	43·44	182
Do. (tailings)	—	100	6·18	26
Do 1S. (do.)	(5)	70	12·50	52
Do (tailings)	—	54	3·08	13
IXL Tailings (Forbes Rhod. Synd.)	—	312	35·01	147
Jumpers (A. H. Newton)	5	150	52·62	221
Kalydon (Rose Mine Synd.)	5	420	103·68	435
Lonely Reef G.M. Co., Ltd.	15 3T	2676	628·77	2641
Do. (slimes)	—	2676	1872·02	7862
Matabele 3 (R. M. Nairn)	10	1265	646·00	2713
Do. (tailings)	—	1215	94·12	395
Nelly (F. D. Roscoe)	2H	874	83·95	353
Do. (tailings)	—	450	55·56	233
New Eclipse (J. R. Stewart)	5	900	297·61	1250
Do. (tailings)	—	266	37·41	157
New Robin A. (E. T. Clayton) (tailings)	—	180	23·70	100
Northern Star and Kimono (Peel's R. Synd., Ltd.)	10	770	347·35	1459
Do. (tailings)	—	550	19·41	82
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 4P	1611	585·08	2457
Do. (tailings)	—	1016	116·07	487
Penzance (R. Urquhart)	2	90	20·46	86
Do. (tailings)	—	70	18·13	76
Percival (E. P. Hall)	5	360	86·82	365
Do. (tailings)	—	320	28·30	119
Queen's (Matabele Queen's Co., Ltd.)	10	1470	372·93	1566
Do. (slimes)	—	1974	318·63	1338
Queen's W. Ext. (Cumings & Berry) (tailings)	—	270	92·51	389
Rainbow (P. Allport)	5	200	38·86	163
Red Rose (C. G. Bancroft)	3	190	26·60	112
Riverbank (R. Martindale)	2	90	32·84	139
Riversdale (Bruhns & Schwarz)	4	110	36·12	152
Romola Nigel G.M. Co., Ltd. (Eastern Queen) (Claydon and Lillian)	5	621	97·13	408
Do. (tailings)	—	300	31·63	133
Smiley D.B. (F. E. Davis)	5	160	24·41	102
Spiral (Reid & Joseph)	5	262	46·40	195
Suffolk (H. D. Bishopp)	5	8	2·59	11
Susanna Mines, Ltd. (Susanna, Lady Lina, and Yellow Aster)	8	1049	477·84	2007
Do. (tailings)	—	602	65·97	277
Do. (slimes)	—	632	92·78	389
Tie Tin (G. Middleton) pannings	—	—	3·95	17
Trump (J. W. Thraves)	5	50	10·86	46
Tuff Nut (King's Synd.)	5	580	314·59	1321
Do. (tailings)	—	360	44·42	187
Wake Up (F. Mathews)	2	11	11·35	48
Zealandia tailings (A. D. Gunn)	—	300	20·33	85
Bulawayo District Total			12,692·13	53,305

Gwelo District.—	No. of Stamps.	Tons Treated	Yield Ozs.	Value £
Arizona No. 2 (A. J. Marchant)	5	235	86·39	363
Arizona No. 2 S. (Williams & Woodger)	2	100	207·41	871
Do. (tailings)	—	200	20·61	87
Beacon Hill 1 (R. Aserman)	2	100	68·86	289
Beppo (I. Maleham) (clean-up)	—	—	21·96	92
Csardas (Wolfshall Synd.)	10	573	342·37	1438
Do. (tailings)	—	418	60·48	254
Emerald (Sphinx Synd.)	2	22	10·62	45
Empire Day (S. Black)	2	127	39·31	165
Gaika G.M. Co., Ltd.	5 1C	2668	986·84	4145
Do. (tailings)	—	1447	144·87	608
Do. (slimes)	—	1221	58·67	246
Gartley (Mrs. A. J. Grant)	2	12	49·78	209
Glenrosa No. 1 (Mackintosh & Lister)	2	148	46·96	197
Globe and Phœnix G.M. Co., Ltd.	40 10P	6326	8285·89	34801
Do. (concentrates)	—	205	405·05	1701
Do. (slimes)	—	2500	531·70	2233
Goldwitch (Mrs. K. A. S. Finnie) (tailings)	—	400	29·17	123
Gollywog (Albion Synd.) (tailings)	—	500	43·55	183
Gretna Green (M. L. Price)	5	85	64·56	271
Guinea Fowl (Sadler & Holloway)	5	400	66·27	278
Invulnerable (A. E. West)	5	185	37·66	158
Junction (J. H. Veasey)	5	418	26·45	111
King's (P. S. Warden)	5	360	172·91	726
Nevada (C. C. Hendrie) April	2	207	74·61	313
New Dunraven G.M., Ltd.	5	673	208·37	875
Do. (tailings)	—	500	26·23	110
N'Kanya (Tranmer G. Synd., Ltd.) (Mrs. R. O. Dollar)	2	54	30·46	128
North Bonsor (Cornish Synd.)	15	1529	231·12	971
Do. (tailings)	—	1050	63·31	266
Pretty Polly (New Rhod. R. Co., Ltd.)	5	523	143·48	603
Do. (tailings)	—	420	79·61	334
Prince George (J. H. Veasey) (tailings)	—	305	23·05	97
Selukwe Columbia G.M., Ltd.	IC 3P	2717	776·28	3261
Do. (tailings)	—	1932	216·72	910
Do. (slimes)	—	1035	80·51	338
Sheba-Bongola (Forbes R. Synd.)	5	275	26·74	112
Do. (tailings)	—	135	136·56	574
South Bonsor (Ideal Synd.)	10	690	64·29	270
Tebekwe (Tebekwe Synd.)	20	1100	224·01	941
Do. do. (tailings)	—	700	33·10	139
Wanderer (Selukwe) G.M., Ltd.	4GR	17800	1776·38	7546
Wild Dog (tailings) (Gilday & O'Connor)	—	350	25·77	180
Willow (W. C. Spargo)	5	315	59·83	251
Wonderland (H. Nicholls) (pannings)	—	—	5·20	22
Gwelo District Total			16,113·97	67,763

Matabeleland Total .. ..28,806·10 ozs.

Value £121,068

MASHONALAND.

Victoria District.—	No. of Stamps.	Tons Treated	Yield Ozs.	Value £
Etna (W. A. Schielke)	5	230	4·60	19
Victoria Total			4·60	19

Lomagundi District.—	No. of Stamps.	Tons Treated	Yield Ozs.	Value £
Alluvial (A. Coleman)	—	—	29·39	123
Eldorado Banket G.M. Co., Ltd.	2C 20	7081	3483·98	14775
Do. (tailings)	—	7305	1023·81	4342
Gella (Hudson & Frost)	3	30	15·59	66
Linnett (A. L. R. Morkel)	2	294	137·20	576
Tripolitania (P. Presot) May and June	6	42	39·53	166
Lomagundi Total			4,729·50	20,048

Mazoe District.—	No. of Stamps.	Tons Treated	Yield Ozs.	Value £
Goth B. (Goth Synd.)	2	80	31·25	131
Hay G.M. Co., Ltd.	10 1T	1881	324·08	1374
Do. (tailings)	—	2103	367·69	1559
Honest (G. Brown)	8	105	36·29	153
Jumbo G.M. Co., Ltd.	30	3310	570·15	2423
Do. (tailings)	—	2190	479·34	2037
Do. (slimes)	—	1120	131·83	561
Mickey (B. G. Byerley)	2	182	111·97	470
Pierrot (J. H. Hall)	2	210	41·72	175
Umkulu D.B. 1W (Llahsram Synd.)	2	93	91·90	386
Thornhill (Oceola G.M. Co., Ltd.)	5	428	264·37	1110
Mazoe Total			2,450·59	10,379

Salisbury District.—	No. of Stamps.	Tons Treated	Yield Ozs.	Value £
Abercorn (J. Seton Rogers) tailings	—	230	13·81	58
Acropolis B. (Landos & Collias) pannings	—	—	1·88	8
Inyague 3 (P. L. Peters)	2	112	77·21	324
Mont d'Or (Claxton & Bussell)	2	147	180·21	757
Old Loyalty (Shamva Ilex G.M. Co., Ltd.)	5	450	252·51	1061
Do. (tailings)	—	230	66·02	277
Radnor (Jones & Wyllie)	2	169	97·90	411
Salisbury Total			689·54	2869

	No. of Stamps.	Toos Treated.	Yield Ozs.	Value. £
HARTLEY DISTRICT.—				
Battlefields (Minaar & McArthur)	2C	1540	378·90	1591
Do. (tailings)	—	1540	203·02	853
Black Chief (S. Macintyre)	3	18	9·01	38
Blue Rock (Ellsmoor & Goodyer)	2	136	79·08	332
Do. (tailings)	—	117	45·61	192
Bridge (John Smith)	5	65	16·69	70
Brilliant (Mabel's Luck Synd.)	5	450	385·65	1620
Do. (tailings)	—	272	68·97	289
Bucka (E. H. Walsh)	(5)	98	35·15	148
Do. (tailings)	—	47	7·92	33
Buller (J. Gunn)	5	500	117·06	492
Do. (tailings)	—	380	97·03	408
Do. (slimes)	—	200	10·95	46
Butterfly, 1 N.E. (F. W. G. Richards) (tailings)	—	500	51·42	216
Cheshire Cat (C. Duncan) May, June ..	(5)	320	169·17	710
Do. (tailings)	—	210	47·58	200
Cocaine (M. H. Routledge)	2	200	36·65	154
Companion (C. H. Wheildon)	5	60	136·33	573
Do. (tailings)	—	30	73·68	309
Compulsory (D. Cumming) (pannings) ..	—	—	19·23	81
Concession Hill and W. Exten: (C. E. Simpson)	5 1C 3P	2368	560·66	2355
Croupier (Croupier Synd.)	2	70	12·27	52
Eiffel Blue & E. Exten. (Willoughbys Con. Co., Ltd.)	10	1176	544·41	2287
Do. (tailings)	—	780	57·15	240
Giant Mines of Rhodesia, Ltd.	30 2T	10600	3951·36	16760
Glasgow Mines, Ltd.	5	411	131·33	552
Do. (tailings)	—	270	31·19	131
Glencairn No. 3 (Glenrosa Synd.)	4	408	253·68	1065
Do. (tailings)	—	276	51·73	217
Golden Valley (J. Mack)	10	675	184·97	777
Do. (tailings)	—	385	53·99	227
Great Tontine (Yellow Jacket Synd.) ..	2	230	34·22	144
I.X.L. (Heroine G.M. Co., Ltd.)	2	165	42·22	177
Jessie Palmer (Crown Synd.)	2	150	45·58	191
Do. (tailings)	—	110	23·36	98
Kanyemba (Kanyemba Synd.)	5	400	591·51	2484
Do. (tailings)	—	150	95·44	401
Lapwing (W. Smith)	(2)	154	50·65	213
Mali (McAdams & Harrill)	2	105	63·30	266
Do. (tailings)	—	308	25·02	105
Mammoth (J. Colliver)	2	300	103·34	434
Masterpiece G.M. Co., Ltd.	5	555	176·32	741
Do. (tailings)	—	430	31·54	132
Moliere (H. Moser)	5	500	123·69	519
New Topaz (J. Hardy) (tailings)	—	300	28·30	119
North Star (Try Again Synd.)	5	604	62·48	262
Old Chum (D. M. McBarnet)	5	120	10·06	42
Do. (tailings)	—	80	26·32	110
Oleander G.M. Co., Ltd. (Oleander & Arlanazer)	3	173	96·96	407
Owl (A. Rolfe)	10	1320	464·03	1949
Do. (tailings)	—	926	186·19	782
Paarl (Union (Mash.) Synd.)	5	351	70·05	294
Pickstone, 1 E. (S. L. Syndicate)	4	390	545·46	2291
Do. (tailings)	—	260	120·06	504
Pool and Pool A. (Pool Synd.) May and June	5	765	157·62	662
Do. (tailings)	—	475	38·93	163
Progressive E. & D. (R. R. Aitkin) ..	—	133	110·42	464
Seigneury (Central Min. & Invest. Corp., and N. A. Arnold)	5	483	105·00	441
Shepherds (Phœnician Synd.)	7	720	349·49	1468
Do. (tailings)	—	700	226·53	951

	No. of Sams.	Tons Treated.	Yield Ozs.	Value. £
Sid (Sebakwe & District Mines, Ltd.) ..	5	671	323·66	1359
Three Cheers No. 1 (F. J. Nalty) tailings	—	930	50·18	211
Unknown (Brooks & Martin)	2	87	31·09	131
Upsala (Macdonald, Sale & Schwabe) ..	5	50	16·54	69
Washington (I. J. Minaar)	5	310	365·36	1535
Do. (tailings)	—	280	22·15	93
Whistlecock 1 W. (T. McDowell)	2	200	48·70	204
Do. (tailings)	—	125	25·16	106
Hartley District Total			12,708·77	53,540
UMTALI DISTRICT.—				
Cairn Dhu 2W. (Parseval Synd.)	5	353	27·08	114
Do. (tailings)	—	32	3·92	16
Don's Grand 1W. (Carrick & Leslie) (tailings)	—	—	1·76	7
Elgin (Umtali Waterfall Synd.)	(10)	439	117·87	495
Do. (tailings)	—	186	8·18	34
Do. (slimes)	—	200	13·44	57
Golden Quarry (T. Brown)	3	65	31·19	131
Kent (Sussex Synd.)	5	730	163·79	688
Kenya (J. Meikle)	3	130	11·78	49
Kurwe 1 N.E. (S. Russell) clean-up ..	—	—	·73	3
Liverpool (R. G. Snodgrass)	5	780	105·43	443
Do. (tailings)	—	280	56·73	238
Mecca (Umtali Waterfall Synd.)	10	475	74·39	312
Do. (tailings)	—	248	38·97	164
Do. (slimes)	—	356	15·37	65
Montezuma No. 2 (Odzi Trib. Synd.) ..	2	60	27·66	116
Palmyra (J. de G. Birch)	3	318	26·48	111
Penhalonga Mines, Ltd.	50	6100	583·40	2475
Do. (concentrates)	—	141	649·79	2697
Pilgrim 2W. (J. Meikle)	5	365	267·93	1125
Rezende Mines, Ltd.	35	4350	1120·19	4753
Do. (concentrates)	—	33	116·91	497
Do. (tailings)	—	2037	312·62	1326
Rezende 1 W. A. (Imbeza Synd.)	10	3299	411·87	1748
Do. (concentrates)	—	8	106·75	448
Umtali (Umtali Waterfall Synd.)	(10)	600	111·13	467
Do. (tailings)	—	548	80·44	338
Umtali Total			4,485·80	18,917

MASHONALAND TOTAL .. ..25,068·10 ozs.

VALUE £105,799

GRAND TOTAL .. .. 53,874·90 ozs.

VALUE .. .. £226,867.

SUMMARY.

GOLD.	ozs.		Value.
Matabeleland	28,806·10	..	£121,068
Mashonaland	25,068·10	..	105,799
TOTAL	53,874·20	..	£226,867
Silver	16,014·49 ozs.		1,827
Chrome Iron	6,160·00 tons.		13,750
Lead	57·98 ,,		928
Coal	16,539·00 Sales		5,538
TOTAL VALUE JUNE OUTPUT			£248,910

MINING MEN AND MATTERS.

Mr. Emile Pusch and the Hon. R. H. Brand, C.M.G., have been admitted as partners in the firm of Lezard Brothers and Co., 40 Threadneedle Street, London.

* * * *

The German Colonial Secretary, Dr. Solf, who, accompanied by Frau Solf and party, arrived in Johannesburg from Kimberley this week, had an excellent welcome from a representative gathering at the railway station. Dr. Solf's party included Privy Councillor Dr. Meyer-Gerhard, Ministerial Councillor Dr. Wolf, Lieutenant Mayer, and Herr Von Heymel. Early on Monday Dr. Solf proceeded to the Cinderella Consolidated, and was escorted over the property. On Wednesday morning the German Colonial Secretary proceeded by motor car to Pretoria, where he visited the German School. He was received by the Acting Governor-General, Lord De Villiers, and lunched at the Pretoria Club as the guest of the Prime Minister, General Botha. On Thursday morning the distinguished visitor paid a visit to the Premier Mine, and on Thursday evening the party proceeded to Delagoa Bay, where they will be the guests of the Governor-General.

Natal Coal Returns.

The coal returns of the Natal Province for June are as follows: Natal Navigation, 25,861 tons; Burnside, 22,533 tons; Durban Navigation, 19,702 tons; Elandslaagte, 19,398 tons; Hlobane, 18,816 tons; Utrecht, 18,602 tons; Glencoe (Natal), 18,382 tons; St. George's, 16,162 tons; Natal Cambrian, 12,822 tons; South African, 11,667 tons; Ballengeich, 9,008 tons; Hatting Spruit, 7,875 tons; Newcastle, 6,981 tons; Ramsay, 5,928 tons; Natal Steam, 5,664 tons; Star, 384 tons; Dewar's Anthracite, 300 tons; Vaalbank, 9 tons; Makateeskop, 4 tons; total, 220,098 tons; corresponding month, 1911, 219,551 tons. Bunker coal, 100,989 tons; coal exported, 36,786 tons; total, 137,775 tons.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Life of the Rand.

To the Editor, *South African Mining Journal.*

Sir,—The following statements appear in a recent article on "Gold Mining in the Transvaal," by Dr. F. H. Hatch, in the July number of *The Engineering Magazine*: "There is no doubt regarding the continuation of the gold-bearing bankets at depth. At a depth of 7,000 feet the rock temperature is about 97½ F. and, with efficient ventilation, the workings could be kept cool at that level. Deep mining, consequently, will be controlled only by the gold content of the ore. Should the gold-bearing formations be worked to a vertical depth of 6,000 feet, and estimating on an average annual return of $200,000,000 gold it will be possible for the industry to be carried on extensively for the next thirty-five years. It is possible, however, that some of the prospecting operations now being carried on both in the eastern and western ends of the banket may result in opening up new gold-bearing ground that will prolong the life of the industry. But there is no doubt that the South African mines will continue to yield large quantities of gold for a period of at least thirty years. In other words, the total gold production of the Transvaal mines in the past will be exceeded by their production in the next thirty years." He also says that: "The grade of ore mined is diminishing, while the actual tonnage crushed is increased. The net result is an augmentation of the net profit." On the assumption that Dr. Hatch took even a casual glance at the statistics of the industry when he was preparing his article, the reason for the last quoted assertion is difficult to conceive. What I wish especially to refer to, however, is the superficial and unsatisfying way in which he deals with one of the most important problems of the Rand, that of the continuance of its gold values in the very deep levels. It is eminently a question for geologists to deal with, and there appears to be a good deal of information, of one sort or another, available for the purpose of coming to some definite conclusion. Dr. Hatch has had numerous and unique opportunities of studying the problem in the way it should be studied, and so have other geologists. In spite of Mr. Draper (*vide* his last communications to the *South African Mining Journal*), I am of opinion that when we have arrived at some knowledge of the genesis of the gold in the bankets, to use the term in a broad sense, we shall be much nearer a satisfactory solution than by a mere analysis of the assay plans of the mines. The latter, like the miner's pick, only tell us what is actually within reach. Why do scientists fight shy of the enquiry? Professor Young, I admit, has done something; so have Messrs. Max Weber and McDonald, indirectly, but the amount of indifference with which their efforts appear to be received must be intensely discouraging.—I am, etc.,

QUERULOUS.

Mr. David Draper's Views Criticised.

To the Editor, *South African Mining Journal.*

Sir,—I am surprised to see Mr. David Draper prominently appearing in the columns of your journal as a self-constituted Knight of the Corner House, challenging all and sundry to open combat, bearing the motto "Damn the financiers," as he has always acted, and spoken, as if he belonged to the other camp. I can quite understand now how it is that he has learnt so little fresh of Main Reef series for the last twenty years, in any district he may have visited, since according to him, and him only, in the first two years of the Rand's history, it was traced from the most southerly point of Randfontein, on the west, to Modderfontein on the east—neither of which farms were open to prospecting then—thereby making Black Reef, Main Reef and Van Ryn series one and the same; and, again according to him, that there is absolutely no Main Reef series, or any other, of value beyond those two points, except two little tiny local enrichments, which he understands, not I. Poor Klerksdorp, Heidelberg and Free State, ta, ta! I grieve for you. Withdraw your pegs, ye prospectors, look for no more "optie gelt" ye "arme boeren," call in the claim inspectors, claim licences are *feeneeshed* for the Government, the fiat has gone forth, Mr. Draper has spoken! I notice that Mr. Draper calls in certain doctors and assistants—of his own teaching may be—to help him damn the outside districts, but that availeth nothing, as, in my humble opinion, these fields have been over-doctored. It is well known that no two doctors agree in their own consulting rooms, whatever they may do in public, and if you take them a real case of "mainreefitis" from an outside district I'm bothered if they can diagnose it, any more than they can "Blue Sky on the brain," which some say I am suffering from.—Yours, etc.,

SCOTT ALEXANDER,
"Rand Stratigraphist."

Johannesburg, July 23rd.

ANSWERS TO CORRESPONDENTS.

"Rhodesia."—The property has certainly to contend with unexpected difficulties, but development is giving improving results, and your shares will, doubtless, in a good market, reach their former quotation.

"Whole."—Leave it alone; the thing is being overdone.

"Hope."—Most decidedly, hold.

"E. F. D."—Quite unfounded.

"A. Wilkes."—Certainly.

Brakpan Mines.

The Directors' quarterly report for the period ended 30th June, 1912, states: Development work: The linear development for the quarter amounted to 4,222 feet, of which 3,173½ feet were on reef averaging 8.7 dwts. over a reef width of 41.9 inches. Ore treatment: The following were the results obtain from reduction operations during the quarter: Milling—Ore hoisted from mine, 178,901 tons; ore from surface dump, 4,253 tons; ore sent to crushing and sorting station, 182,579 tons; percentage of waste sorted out, 14.61 per cent.; average number of stamps running, 130 stamps; net running time, 87.619 days; ore milled, 156,946 tons; milling duty per stamp per 24 hours, 13.78 tons; yield in fine gold, 34,887 ozs.; yield per ton milled in fine gold, 4.446 dwts. Cyaniding.—Tons treated, 157,300 tons; yield in fine gold, 24,467 ozs.; yield per ton treated in fine gold, 3.111 dwts. Summary.—Yield in fine gold: Mill, 34,887 ozs., 4.446 dwts. per ton milled; cyanide works, 21,467 ozs., 3.118 dwts. per ton milled; total, 59,354 ozs., 7.564 dwts. per ton milled.

Working expenditure and revenue account.—Tons milled, 156,946. To mining expenses, £88,773 2s. 4d., per ton milled, 11s. 3.75d.; to development, £11,770 19s., per ton milled, 1s. 6d.; to reduction expenses, £29,166 10s. 8d., per ton milled, 3s. 8.60d.; to general expenses—Mine, £5,799 7s. 9d., per ton milled, 8.87d.; head office, £2,331 18s. 3d., per ton milled, 3.57d.; total, £137,841 18s., per ton milled, 17s. 6.79d.; working profit—carried down, £112,911 7s. 9d., per ton milled, 14s. 3.37d.; total, £249,911 5s. 9d., per ton milled, 31s. 10.16. Capital expenditure for the quarter:—On account of original equipment (per directors' report 31st December, 1911), £7,825 13s. 10d.; current capital expenditure, £3,501 7s. 10d.; total, £11,327 1s. 8d. General.—Following the decision to discontinue carrying reserve gold, a special declaration of the reserve was made at 30th April, 1912, amounting to £15,973 9s. An interim dividend (No. 1) of 15% was declared on the 14th of June, 1912, payable to all shareholders registered on the 29th June, 1912.

THE WEEK IN THE SHAREMARKET.

Firmer—Buying from London—Improving Outlook.

LONDON, apparently, has not quite lost interest in the Rand. From that quarter some buying orders were received during the week, lending an unexpected firmness to the local market. It is most refreshing to hear that, after months of coquetting with Canada and South America, the London market is beginning to take an interest in its old love, South Africa. The Rand, certainly, could do with some attention, a daily growing number of its stocks standing at attractive levels. The economies that have been effected recently are bound to exert a good influence with investors, and the London people will, no doubt, soon awaken to the fact that the Rand is being successful in putting its house in order. From the diamond market excellent reports are to hand. Daily the distance between supply and demand widens, and prices are steadily mounting. Premiers are reflecting the "boomlet" in the price of the Deferred shares, and all the smaller counters should benefit. Caution, of course, is necessary regarding the latter, as mere gambles will, no doubt, be encouraged on the strength of the general improvement. Tins remain extraordinarily dull, despite good reports from the mines, but, in any increase of market activity, they must participate.

* * * *

	Friday, 26th.	Sat., 27th.	Monday, 29th.	Tuesday, 30th.	Wed., 31st.	Thurs. 1st
African Farms ...	14 9B	14 9B	14 9B	14 6B	14 6B	14 6B
Adair-Usher Process	...	...	...	...	1 0B	..
Apex Mines ...	...	23 0S	25 6B	25 6B	23 0B	...
Bantjes Consolidated	22 0S	...	...	21 0S	20 0B	...
Benonis	4 6B	4 9	4 6B	4 6B	4 6B	4 3B
Bushveld Tins ...	...	1 3S	...	1 2S	...	...
Brakpan Mines ...	73 6B	73 6B	72 6B	72 6B	74 0S	74 6
Cinderella Cons. ...	..	...	...	20 3B	...	21 0B
City and Suburban ...	47 0	46 9B	47 0	46 9B	47 0B	47 3B
City Deeps	55 6B	...	56 0B	56 9B	57 0B	57 9B
Cloverfield Mines ...	5 0B	5 0B	5 0B	5 0B	5 0	...
Cons. Langlaagtes ...	22 0B	22 6B	22 6B	22 6B	23 0	23 3B
Cons. Main Reefs ...	19 3	19 0B	19 3	19 3	19 0B	19 3
Coronation Freeholds	0 4B	0 4B	0 4	0 4B	0 4B	...
Clydesdales	11 6S	...	11 6S	...	11 0S	11 0S
Concrete Cons. ...	...	...	...	...	10 0S	...
East Rand Cent. ...	10 0B	9 3B	9 6B	9 6B	9 6B	9 6B
East Rand Coals ...	2 3B	2 3B	2 3B	2 3	2 3B	2 3B
East Rand Deeps ...	2 0B	2 0B	...	...	...	...
East Rand Props. ..	56 0	56 0	55 6B	55 6B	...	56 0B
East Rand Deb. ...	£92	..	£93	...	£92	–
Eastern Gold Mines	1 9B	1 9B	1 9B	1 9B	1 10	1 9B
Frank Smith Diam...	9 0B	9 0	...	8 0B	...	8 6B
French Rands ...	...	1 0B	1 0B	...	...	...
Govt. Areas... ...	22 9	22 9B	22 9B	22 9	22 6B	22 9B
Glynn's Lydenburgs	27 0B	27 0B	29 0S	27 0B	...	21 6B
Ginsbergs	27 9B	27 0B	27 0B	29 3B	...	...
Glencairns	4 0B	4 3S	...	...	...	...
Glencoe (Natal) Colls	5 9B	5 9B	5 9B	6 0B	6 0B	6 0B
Geduld Props. ...	...	...	...	...	...	22 0B
Hex Rivers	...	...	0 1B	0 4B	0 5B	...
Jumpers	...	...	6 0B	...	6 0B	...
Jupiters	10 6B	10 9	10 6S	10 3B	...	10 0
Kaalfontein Diamonds	0 4B	0 4B	0 4B	0 4B	...	0 4B
Klerksdorp Props. ...	2 9B	...	...	2 9B	...	...
Knight Centrals ...	13 3	13 0	13 0B	12 6B	12 9B	12 9B
Luipaardsvlei Estates	7 6B	7 6B	7 6B	7 6B	...	7 6B
Lace Props.	3 4B	3 3B	3 3B	3 4	3 4	...
Lydenburg Gold Farms	2 0B	2 2B	2 2B	2 2B	2 2B	2 3B
Main Reef Wests ...	25 9S	25 6	...	24 9B	25 0B	..
Modder B's	58 6S	58 0S	57 6B	58 0B	59 6	58 6S
Midas Deeps ...	0 4	0 4	0 3B	0 2S	...	...
Middelvlei Estates...	1 4B	1 3B	1 6B	1 5B	1 5B	1 6B
Modder Deeps ...	...	28 0B	...	27 6B	...	28 0B
New Eras	7 0B	7 0B	7 0	7 3	7 0B	7 0B
New Kleinfonteins...	25 6B	...	25 0B	26 0	25 0B	25 0
New Rietfonteins ...	..	8 0B	...	7 9B	7 6B	...

B Buyers. S Sellers.

	Friday, 26th.	Sat., 27th.	Monday, 29th.	Tuesday, 30th.	Wed., 31st.	Thurs. 1st.
New Unifieds ...	17 6S	17 6S	17 6S	17 6S	17 6S	17 6S
New Boksburgs ...	...	1 6B	...	1 6B	1 3B	1 6B
Orange Diamonds ..	1 4	...	1 4	1 2B	...	1 4B
Pigg's Peaks ...	11 6B	11 6B	11 6B	11 6B	11 6B	11 6B
Pretoria Cement Co.	50 6	50 6B	50 6	50 0B	...	50 0B
Pretoria Estates ...	...	...	...	17 6S	17 6S	...
Paardekraal Estates	...	0 6B	...	...	0 6B	...
Potchefstroom Est....	...	1 0B	..	...	1 0B	1 0B
Princess	9 9B	9 9B	9 6B	9 6B	9 6B	...
Rand Nucleus ...	2 9B	2 9B	2 9B	2 9B	2 9B	2 10B
Randfontein Estates	26 0B	26 0	25 6B	25 6B	25 0B	25 6B
Randfontein Deeps...	4 0B	4 0B	4 0B	4 0B	4 0B	4 0B
Rooiberg Minerals ..	30 0	29 6B	29 0B	28 3	28 6B	29 3B
Rood. U.M.R. ...	16 3S	16 3S	11 0B	16 3S	16 3S	...
Rand Klips	4 6B	4 6B	4 6B	4 6B	4 6B	4 6
Ryan Nigels ...	3 10B	...	...	...	...	...
Roberts Victors ...	...	14 0B	12 6B	13 6B	13 6B	12 6B
Simmer Deeps ...	3 0B	3 0B	3 0B	2 6B	2 6B	3 0
South African Lands	4 0B	4 0	4 0B	3 10	3 9B	4 0
S. Randfontein Deeps	3 3B	3 3B	...	...	3 3B	3 3B
Sub Nigels	5 0B	5 3	5 0B	...	5 6S	5 0B
Springs Mines ...	...	10 0B	13 6B	14 0B	14 0B	14 0B
S. A. Breweries ...	38 9B	39 0B	39 0B	39 0B	40 0	40 0
Trans. G.M. Estates	46 0S	...	44 6B	44 0B	44 6B	..
Temple Tins	5 0S	4 4	4 0	4 6	4 7B	4 9S
Trans. Coal Trusts...	43 0	43 6	43 0B	43 0B	43 6B	43 9
Tudors	2 0S	1 0B	...	...	1 3B	1 3B
Van Ryn Deeps ...	16 9	16 4	16 6	15 9B	16 6B	16 0B
Village Deeps ...	...	...	...	37 6B	...	...
Vogel. Cons. Deeps...	0 9B	0 9B	0 9B	0 9B	0 9B	1 0S
Voorspoed Diamonds	10 0B	10 0B	9 9B	9 9B	10 0	9 0B
Van Dyks	...	...	...	...	1 0B	1 0B
Witwatersrands ...	52 6B	53 0B	53 0B	...	53 0B	53 0B
Wolhuters	20 6B	20 9B	20 9B	21 0	20 6B	21 0B
Witbank Collieries...	42 0B	45 0B	43 6B	...	...	...
Wit. Deeps	...	...	...	45 0B	...	..
West Rand Est. ...	...	...	2 6B	...	...	...
West Rand Con. ...	9 0B	...	10 0B	9 0B	...	...
Zaaiplaats	36 6B	38 0	36 6	36 0	35 3B	34 0

B Buyers. S Sellers.

INVESTORS' DIARY.

The following company meetings have been announced:—

Aug. 30.—Treasury Gold Mines; Wit. Deep; Crown Mines.
Sept. 4.—New Kleinfontein.
Sept. 21.—Wit. Deep.
Sept. 23.—Crown Mines.
Sept. 27.—Sub-Nigel; Simmer and Jack Prop.; New Kleinfontein; Wolhuter, G.M.
Oct. 19.—Wolhuter G.M.
Nov. 6.—New Modderfontein.

New Thor Diamonds.

The secretary of the New Thor Diamond Mining Co. supplies the following information: "On the 30th of November last the company suspended operations, pending the arrangement of its finances, which has since been satisfactorily effected. Boring operations for water were commenced, at a later date, with a view to the company securing its water supply within its own property, and the directors are pleased to report that the boring was quite successful, a good supply being found, in addition to which, the company retains its water right on the adjoining farm. A lot of development work, in the mine has been in progress, such as tunnelling, stripping of overburden, etc., and last week washing was restarted with the two pans. The ground being put through is rather mixed and dirty, but the result for the week was 114 carats, of the usual quality. It is hoped that within a few weeks washing of clean yellow will be in progress." This report is singularly incomplete and indefinite. No mention, for instance, of the quantity of ground treated to obtain the results stated.

Electrical Notes.

A YEAR OF ELECTRICAL ACCIDENTS.

The annual report of the Chief Inspector of Factories and Workshops to the Home Office, issued recently, contains the report of the electrical inspector, Mr. G. Scott Ram, which is given in abstract below :—

Table I.—Accidents at Electrical Generating Stations and Sub-Stations in 1911.

The small figures relate to fatal accidents, and are included in the principal figures.

Description. (1)	Public supply stations and electric railways and tramways. (2)	Other stations. (3)
Non-electrical :—		
At engines, pumps and generators ...	18	4
At boilers and steam plant	39	6
At coal-handling plant...	18^{1}	3
Falls...	76^{5}	8^{1}
Struck by falling bodies	28	—
Miscellaneous...	91^{1}	17
Total...	270^{7}	38^{1}
Electrical :—		
At switchboards when engaged in ordinary routine work—mostly due to faulty design of apparatus or to mistakes on the part of the switchman	12	5
Cleaning, repairing, etc., at "live" switch-boards or other "live" conductors...	27^{3}	2
Cleaning, repairing, or other handling of switchboards supposed to have been made "dead"—		
Skilled persons...	3^{1}	—
Unskilled persons...	—	—
Adjusting brushes and cleaning commutators	9	3
Miscellaneons	12	1
Total	63^{4}	11

The number of mechanical accidents is about the same as in the previous year, and calls for no special comment. The number of electrical accidents was somewhat greater—74 against 58 last year—the number of fatalities, 4, being the same. With few exceptions the causes of the accidents were similar to those which I have described in detail in former reports. In working on a dead portion of a high-tension switchboard, adequate screening of adjacent live conductors is not always provided. In one of these cases the man received a shock and severe bunrs from a 6,000-volt system. He was rendered insensible, but was brought round by artificial repiration, and was able to return to light work in about six weeks. In another similar case, the man was killed outright on a 20,000-volt system. Screens were actually provided in this case and were lying on the floor unused. The actual work in hand was upon some apparatus about 2ft. or 3ft. from the floor. There were live conductors above, about 8ft. 6in. from the floor. It was overlooked that in reinstating the apparatus a man might climb on to a part of it, and so be within reach of the live conductors.

Several accidents occurred in cleaning extra-high-tension switchboards.

In the second fatal case a competent and experienced man appears to have forgotten that the oil switch which he was examining was live, and touched one of the terminals. It is remarkable that of the above nine accidents on high-tension or extra-high-tension alternating systems, only two had fatal results.

Several accidents occurred through men making short circuits on direct-current medium-pressure systems. Some were due to the omission to take any kind of precautionary measures. Thus ordinary engine room spanners were used in several cases to tighten up nuts at the back of switchboards, no precautions by screening or otherwise being applied to a live nut on one pole, and bare bus-bars or other conductors on the other pole being only a short distance away—less than the length of the spanner. The extraordinary thing is that such things are done by switchboard attendants of experience. Much of the blame often, however, lies with the employers or their responsible engineer in not providing special insulated spanners or other forms of temporary protection in view of work on live conductors becoming necessary. In one case, two assistant engineers proceeded on the above lines to tighten up a live nut on one of the main connections behind the bus-bars at the back of the switchboard and produced the inevitable short circuit. They were both burned, but not very badly. The short circuit apparently produced a surge with probably a big rise in the pressure on the breaking of the short-circuit, with the result that a flash-over occurred at another part of the switchboard several feet away, at a place where the positive and negative conductors on a marble panel were barely 1in. apart without any insulating division between. The normal difference of pressure between these conductors was 580 volts, and although this would be a long way below that necessary to start an arc between conductors in air, it might conceivably do so without difficulty if dirt or dust were allowed to accumulate on the surface of the marble. There is no doubt, however, that on the breaking of a very heavy current such as would be caused by a short circuit on a station switchboard with 2,000 or 3,000 kw. behind it and with no circuit-breakers on the generators, a very great momentary rise in pressure might occur. On 550-volt traction switchboards it has been proved that the operation of a feeder circuit-breaker on heavy overload may produce a momentary rise of pressure of over 10,000 volts. The design of the switchboard, with the main conductors placed so closely together, was obviously at fault, as even under normal conditions accidental short circuit might be readily brought about, and the mere cleaning of the surface of the marble between the conductors would be a hazardous undertaking. The above accident had a very unfortunate sequel a few hours later. The switchboard attendant noticed that at the place where the arcing-over had occurred, there was a slight discharge going on across the marble between the positive and negative conductors. This may have occurred through a film of copper having been deposited on the marble at the time of the flash-over. He reported the sparking to the station superintendent, and while the latter was looking at it, it again developed into a flash-over or short-circuit, with the result that the superintendent was so severely burned that he died within a few hours.

Under the next heading, the fatal accident occurred to an experienced man who was about to do some work in a cell of a single-phase high-tension switchboard. The system had one pole earthed, and the switchboard was a single-pole one. The cell contained an oil switch for a generator. The switch was connected directly, and not through isolating switches, to the ring bus-bars of the switchboard. The bus-bars were, however, provided with a number of disconnecting links in order that any circuit might be isolated by removing the link on each side of the point where it connected with the bus-bars. The man had removed the links on each side of the connection to the switch at which he was intending to work. Unfortunately the system of disconnecting links had not been adhered to when extensions had been made. A generator placed at a later date in another engine room had been connected to the same part of the bus-bars. The removal of the two disconnecting links did not, therefore, disconnect the second generator from the switch cell in question. This second generator happened to be at work, and although it was connected to the bus-bars through an oil switch, the man appeared to have forgotten the arrangement of the connections, and omitted to pull out the switch. He consequently opened the door of the switch cell of the first generator, thinking it was all dead, and received a fatal shock. The accident appears, therefore, to have been in part attributed to the connection of the subsequent generator with the bus-bars not having been carried out on the same lines as those of the other circuits. The design of the switchboard was such that the connections could not be readily traced. It is important with all such switchboards, where the connections are not visible or obvious, that a diagram of the connections should be hung up in the switch room for ready reference before any work is undertaken. A useful precaution adopted in many stations is also recommended, namely, that a second competent person should check the position of the switches and isolating links before any work is commenced.

Of the miscellaneous accidents, several occurred to unskilled persons, and were due to lack of proper supervision. Four occurred on extra-high-tension systems, and were remarkable only because the injuries did not prove fatal.

(To be continued.)

Holophane Reflectors.

A new line of reflectors has been devised by the Holophane Company. They are made on the same principles of light control and distribution as the standard stiletto type reflectors, so that a high degree of efficiency is obtained. At the same time, however, due regard has been given to the æsthetic side of the question. As a result these reflectors not only give excellent lighting effects at night time, but they also have a permanent decorative value. The residence Holophane reflectors are made in a number of different patterns, to suit every class and period of electric-light fitting. In every case they have been designed, not only to appear beautiful and to give efficient lighting results, but also to hood or cover the lamp, so that the brilliant filament is not directly visible. The effect given by one of these reflectors with a lighted lamp inside it is that of a uniformly brilliant surface, throwing out light equally from every point.

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Engineering Notes and News.

Rock Drills at Work in the Transvaal.

The number of rock drills employed on the Transvaal mines has increased by over 500 since the beginning of the year, there being 4,791 at work in January and 5,322 in June. By far the larger number of these were, of course, in use on the Rand, there being an average number of 5,244 employed on the Witwatersrand, 45 in the Heidelberg district, 16 at Klerksdorp, and 17 in the Barberton area. The large increase in the number of machines at work is, in the main, attributable to the more extended employment of small stoping drills, particularly on mines under the control of the Consolidated Goldfields of South Africa.

A New Type of Skip.

A modification of the De Beers type of skip for a vertical shaft, which is an improvement over the old type, is being utilised in the Minnesota Iron Mines, United States of America. The top of the old type of De Beer's skip was square, and trouble was experienced from ore falling back into the shaft. This not only gave the shaft an untidy appearance, but in a few instances the men working near the shaft were seriously injured by falling pieces of ore. Attempts were made to improve the skip; in one instance a lip was riveted to the bottom plate; in another a filling piece was attached to the dump plate, thus throwing the lip up further from the edge of the shaft. These changes proved to be only partially successful in stopping the ore from falling back down the shaft, but they introduced other faults which were nearly as bad. The lip would spread the discharge of ore so that it would lie on the dump angles, causing the skip to stick as it descended; and the filling piece decreased the inclination of the skip when dumped so that it did not clear itself rapidly. When the new Pettit headframe was built it was decided to make some changes in the design of the skip. It was made longer in proportion to the base than is customary; the dimensions being, base 3 ft. x 4 ft. and length 6 ft. on one side and 5 ft. on the other. The base dimensions are unusual, because of local conditions. Under ordinary conditions it would have been nearly square. The additional length, however, throws the lip considerably farther away from the shaft, and all the ore is discharged well back from the edge of the shaft. By incorporating the extended lip in the body of the skip itself, the trouble caused by the ore gathering on the dump plates was entirely overcome. The new skip was satisfactory from the start. A few changes were made in the dump plates which are worthy of mention. The dump angles were shod with a ⅜in. strap; as this strap is worn it can readily be replaced without removing the dump angle itself, thus making the repairs much easier and simpler. The plate was reinforced behind the dump roller by a channel. This prevented the bending of the plate at this point, which on the larger skips is troublesome.

Booysens Estate.

The report of the Booysens Estate, Ltd., for the year ended June 30th, 1912, shows that the credit balance on income and expenditure account at June 30th, 1912, amounted to £25,689 10s. 5d., made up as follows: Credit balance at June 30th, 1911, £25,833; less balance of expenditure over income for the year ended June 30th, 1912, £143. The company has the sum of £30,000 on fixed deposit, which sum will be utilised in liquidating the contingent liability of £30,000 due to the vendors and referred to in the balance sheet. The extension of the Robinson Deep's No. 2 incline shaft into the company's property has been continued, the footage sunk for the year ended June 30th, 1912, being 234 feet, at a cost of £3,908 11s. 1d., making a total footage sunk in the company's ground of 622 feet, at a total cost of £10,333 13s. 6d.

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Finance, Commerce, and Industries.

Big Irrigation Scheme.

The Smartt Syndicate of Britstown has just completed one of the largest, probably quite the largest, irrigation work in South Africa. After many disappointments, washaways and so on, the company has finished the construction of its great dam wall, which should now be secure against any flood, and a huge lake of water has been impounded. The company is now laying out the land which will be brought under water and a large area of the Karoo will, in a few months' time, be under cultivation. The many friends of Sir Thomas Smartt will congratulate him on the result, and will wish him all possible success.

* * * *

Transvaal Land Bank.

The report of the Transvaal Land and Agricultural Bank for the year ended the 31st of March, 1912, has just been issued. During the period under review, 1,304 applications for loans were received, representing £551,174, making a total received since the opening of the bank on the 4th of November, 1907, of 7,680 applications, representing £3,301,231. The loans approved of by the Board amount to £458,400, of which, however, loans representing £94,075 were declined by applicants, £362,325 being accepted. Loans amounting to £398,475 were paid out during the period, making a total since the opening of the bank of £2,021,566. The value of security (farms) is £6,923,478, and collateral security (urban property) £22,275. The districts in which the most borrowing was done were Potchefstroom £195,523, Standerton £186,532, Middelburg £182,155, and Pretoria £180,606. The analysis of the loans made from the 1st of April, 1911, to the 31st of March, 1912, is:—31 loans over £1,500 and not exceeding £2,500; 37 loans of £1,000-£1,500; 142 loans of £500-£1,000; 258 loans of £250-£500; 361 loans of £100-£250; 308 loans of £100 and under; total number of loans, 1,137. Repayments during the year amounted to £188,465, making a total since the opening of the bank of £426,429. A statement of liabilities and assets and profit and loss account for the year shows that the net profit is £21,744 5s. 6d., which amount in terms of Section 17 (1), (a) and (b), of Act No. 37 of 1908, has been placed to the credit of the reserve fund, which now stands at £56,355 7s. 7d. The administration expenses were £·605 per cent. of the amount invested on mortgage and advances to co-operative societies, which shows a reduction of £·098 per cent. as compared with last year. The total earnings represent £5 3s. 6d. per cent. on the bank's capital.

* * * *

Sale of Farms.

In Johannesburg, on Thursday morning, a number of farms in the Northern Transvaal were put up for auction. There were eleven farms sold, the bidding was spirited, and the total amount realised was £5,070 7s. 6d. The details were as follows:—"Matanan," in extent 2,785 morgen, situated about fifty-five miles to the N.W. of Pietersburg and Potgietersrust, on the Sepavanie River, £487 7s. 6d., 3s. 6d. per morgen; "Nonnenwerth," in extent 2,813 morgen, about fifty miles from Pietersburg, £562 12s., 4s. per morgen; "Ketting," in extent 2,196 morgen, about sixty miles from Pietersburg, £411 15s., 3s. 9d. per morgen; "Mons," in extent 2,815 morgen, on Magalaquen River, £774 2s. 6d., 5s. 6d. per morgen; "Dusseldorf," in extent 3,308 morgen, about sixty miles from Pietersburg, £620 5s.,

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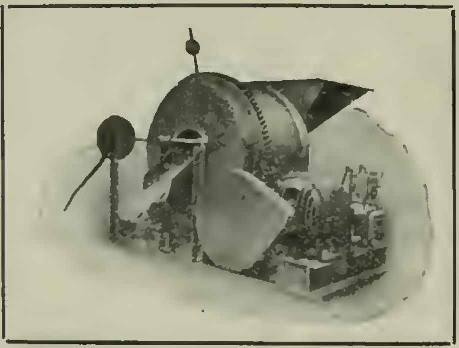

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3s. 9d. per morgen; " Cracouw," in extent 2,716 morgen, on Sepavanie River, £509 5s., 3s. 9d. per morgen; " Heelfrai," in extent 1,502 morgen, on Sepavanie and Magalaquen Rivers, £375 10s., 5s. per morgen; " Breda," in extent 1,259 morgen, on the Magalaquen River, £299 0s. 3d., 4s. 9d. per morgen; " Pentonville," in extent 1,290 morgen, near the Bechuanaland Border, £172, 2s. 8d. per morgen; " Vogelstruisfontein," in extent 1,376 morgen, on the west bank of Pongola River, £309 12s., 4s. 6d. per morgen; " Weltevreden," in extent 2,053 morgen, on the west bank of the Magalaquen River, about thirty-five miles from Zaaiplaats tin mines, £538 12s. 3d., 5s. 3d. per morgen. All these farms have been surveyed.

* * * *

Commerce and Industries Commission.

Regarding the Commerce and Industries Commission, the recent Congress of Chambers of Commerce urged upon the Government that any legislation dealing with the subjects inquired into by the Commerce and Industries Commission should recognise the following principles, viz.: (a) Having regard to the fact that the prevailing high cost of living restricts industrial operations and the development of the country generally, the interests of the consumer should have paramount consideration in the framing of all tariffs. (b) That a protective Customs tariff is opposed to the interests of South Africa for the following reasons: (1) That one effect of the same now is, and must be for a long time to come, to increase the cost of living and thus to discourage immigration and closer settlement; (2) That the tendency of protection to create monopolies, of which ample evidence exists in connection with other countries (notably the United States and Germany), will be still stronger and more harmful in a sparsely settled country like South Africa. (c) That the Union of South Africa should continue to raise part of its revenue by a Customs tariff, but that the same should be substantially low and uniform on all classes of goods save only: (1) That spirits, wines, tobacco, patented drugs, and other articles of luxury shall carry an extra duty; (2) That raw materials for industrial purposes, as well as farm implements, fertilisers, and such articles of which the intended use will assist in the development of industries, be admitted either entirely free or at a low rate of duty; (3) That a preferential rebate on goods of British origin be continued. (d) The existing Customs tariff should be revised by the removal of its protective features.

* * * *

South African Industries.

Mr. G. Constable, M.P.C., in proposing the toast of " South African Industries " at a dinner of the commercial men of Boksburg recently, complained of the lack of railway facilities, which was detrimental to industries in inland towns. In the course of his remarks he said that South African industries were hampered in very much the same way as the trade and commerce of Boksburg, because the population was some distance from the centre of the trade, i.e., those who consumed the products were away from the producers. The gold industry was not affected, but other industries were. The best coalfields were in the Transvaal, being better even than the coalfields in Natal, as the Transvaal coal was the best in South Africa. Not only, however, was South Africa hampered by the " terrific mileage," but by the heavy rates charged on the railways. During the recent strike in England an enormous number of orders were diverted to South Africa. Despite the magnificent efforts made to take advantage of and coping with the number of orders diverted to South Africa from the Old Country, mineowners found week after week that they could not get trucks to convey the coal, because the rolling stock was inadequate: and, when they got the coal down to the ports, it remained there week after week, and the boats had long delays in getting bunkered. They must, however, welcome the new mail contract and the great interest taken by the head of the great combination which would in future conduct the contract. He predicted an enormous expansion of the coal industry, and considered that there was no reason why South Africa should not supply India, North America, and even to the Suez; but they must have the assistance of the railways. As regarded other industries, he said that the people in the inland towns must for centuries suffer tremendous difficulties by reason of coastal competition. Even if the inland towns had no physical difficulties to combat, they had such political difficulties, and such an unsympathetic Government, that they could not hope to develop rapidly the inland industries. There were, however, industries which could be developed with profit to the country—the woollen industry in particular. Hundreds of thousands of blankets were sold to natives, but the material therefor was sent to Europe, where the blankets were manufactured. It went 7,000 miles, and returned a like distance before being sold to the natives. With a paternal and watchful Government the industry could support thousands of employees.

Princess Estate and G.M. Co.

Tons milled, 54,900; revenue from gold, £70,658; working costs, £70,531; cost per ton milled, 25s. 8.333d.; working profit for quarter, £127; profit per ton, .555d.; sundry revenue, £1,096; debenture charges, £405; interest, £697; balance profit for quarter, £121; balance debit for quarter after deducting capital expenditure, £310. The footage driven, risen and sunk on the reef and sampled was as follows: South Reef, 535 feet averaging 7.7 dwts. over 25 inches; Main Reef, 110 feet averaging 8.1 dwts. over 32.14 inches. It is estimated that the payable ore (based on the milling width) developed by the above footage is: South Reef, 23,801 tons; Main Reef, 1,604 tons; total, 25,405 tons. These figures are subject to recalculation at the end of the year when block values are made out.

Lancaster West.

Tons milled, 59,450; revenue from gold, £70,295; working costs, £67,183; cost per ton milled, 22s. 7.22d.; working profit for quarter, £3,111; profit per ton, 1s. 0.56d.; sundry revenue, £1,892; debenture charges, £1,927; balance profit for quarter, £3,076; balance for the quarter after deducting capital expenditure, £1,998. The mine development was as follows:—Driving, Botha section, 90ft., battery section, 669.5ft., total feet, 759.5; winzes, Botha section, 295ft., battery section, 415.5ft., total feet, 710.5; raises, Botha section, 242.5ft., battery section, 78ft., total feet, 320.5; totals, Botha section, 627.5ft., battery section, 1,163ft., total feet, 1,790.5. The ore (based on the milling width) developed by the above footage is: Tons developed, Botha section, 4,500; Battery section, 19,900; totals, 24,400. Tons payable: Botha section, 4,500; Battery section, 3,105; totals: 7,605. The footage driven, risen and sunk on the Battery section and sampled totalled 445 feet, averaging 10.37 dwts. over 33.2 inches, and on the Botha section 365 feet, averaging 6.16 dwts. over 39.48 inches. These figures are subject to recalculation at the end of the year, when block values are made out.

Geduld Proprietary Mines.

Tons milled, 43,490; revenue from gold, £56,243; working costs, £44,068; cost per ton milled, 20s. 3.191d.; working profit for quarter, £12,175; profit per ton, 5s. 7.188d.; sundry revenue, £1,425; balance profit for quarter, £13,610; balance for the quarter after deducting capital expenditure, £4,451. For the three months ended 30th of June, 1912, the footage sampled on the reef totalled 2,218ft., the assay values of which are as follows: No. 2 shaft: No. 1 level, north drive, 140 feet sampled 9.5 dwts. over 13.7 inches; No. 1 level, south drive, 270 feet sampled 7.9 dwts. over 16.9 inches; No. 1 level, south No. 1 winze, 35 feet sampled 5.6 dwts. over 31.4 inches; No. 2 level, north drive, 250 feet sampled 21.4 dwts. over 15.4 inches; No. 2 level, north No. 1 raise, 320 feet sampled 11.6 dwts. over 28.7 inches; No. 1 level, north No. 1 winze, 135 feet sampled 49.6 dwts. over 16.8 inches; No. 2 level, south drive, 105 feet sampled 9.0 dwts. over 30.6 inches; No. 2 level, south No. 1 winze, 145 feet sampled 7.1 dwts. over 21.7 inches; Winch chamber for No. 2 shaft, 20 feet sampled 66.5 dwts. over 6.7 inches; main south drive, No. 4 raise, 140 feet sampled 4.8 dwts. over 30.4 inches; main south drive, winze from No. 4 raise, 10 feet sampled 13.9 dwts. over 58.5 inches; main south drive, No. 4a raise, 53 feet sampled 3.6 dwts. over 26.9 inches; " A " level, No. 1 north raise, 235 feet sampled 34.5 dwts. over 24.5 inches; " A " level No. 1a north raise, 15 feet sampled 22.3 dwts. over 30.1 inches; " B " level, No. 3 raise, 80 feet sampled 22.8 dwts. over 18.8 inches; " B " level, north from No. 3 N. raise, 25 feet sampled 10.4 dwts. over 21.2 inches; " B " level, south from No. 3 N. raise, 95 feet sampled 9.5 dwts. over 17.2 inches; prospecting raise, 15 feet sampled 4.8 dwts. over 58.7 inches.

May Consolidated.

Tons milled, 41,100; revenue from gold, £51.323; working costs, £33.202; cost per ton milled, 16s. 1.882d.; working profit for quarter, £18.121; profit per ton, 8s. 9.816d.; sundry revenue, £754; balance profit for quarter, £18,875.

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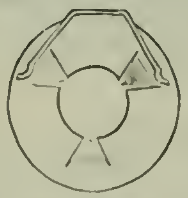

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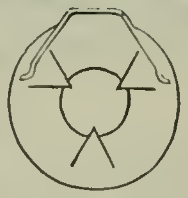

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Notice to Motorists.

It has come to our notice that certain unauthorised persons are making use of the empty tins in which WAKEFIELD "CASTROL" BRAND of Motor Car Oil is originally sold, and supplying an inferior quality oil therein.

This is, therefore, to warn consumers of our oils against imitations.

To ensure getting the genuine quality please see that our seal, on all tins, has not been tampered with.

Johannesburg, this 7th day of June, 1912.

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Automobile Notes.

"Park" Trophy Trials.

Intending competitors in the "Park" Trophy Trials on the 10th and 11th inst., are reminded that the closing date for all entries is fixed for August 7th, when all forms duly completed must be in the hands of the secretaries of the Transvaal Automobile Club. the promoters of the contest. It is also notified for information that club members not desirous of competing, but willing to make a pleasure run, should inform the secretaries also on the 7th inst. of any such intention. This provision has in view the ensuring of the requisite accommodation for friends of competitors and others, who may be disposed to stay over night at Potchefstroom, one of the conditions governing the race. The annual club dinner, referred to in a recent issue of the journal, is being held on the evening of the 10th, at which a representative gathering is expected. The function is in the capable hands of the manager of the King's Hotel, Potchefstroom, the official hotel of the T.A.C. at that place.

The Approaching Holidays.

In view of the approaching holidays, when many motorists will take advantage of the ideal weather conditions prevailing to visit one or other of the popular resorts, within easy distance of Johannesburg, mention may be made of the advantage which attaches to Automobile Club membership in that special terms are offered by the appointed official hotels at some thirty-six Transvaal towns to motorist members. In addition, with few exceptions, petrol supplies, etc., can be obtained at these places, and repairs effected. Special terms can also be arranged for large parties when desired. The club committee are to be complimented on providing such facilities which in turn are greatly appreciated by those designed to assist. Were these and other advantages more widely recognised by the motorist community in general, the club membership would probably experience material change in point of numbers.

The Skid and the Side-Slip.

There is practically little to be feared from the skid under present climatic conditions and advice on the matter of the side-slip may not at the moment be altogether necessary. With the advent of the rains, however, considerable importance attaches, and a few suggestions to the motorist in consideration of other road users may be filed for future reference, so to speak. Few motorists who have not at one period or other cycled themselves realise the danger of passing a cyclist at close quarters on a day when the streets or roads are greasy. At all times there is a tendency for cycles to side-slip on a wet surface, and this tendency is aggravated in proximity to the motor car. In crowded thoroughfares, therefore, it is incumbent that the motorist, in addition to careful handling of his machine, should respect effecting a margin, when possible, between his car and the cyclist journeying in the same direction. An observance of road courtesy in this respect would not alone assist towards the decrease of accidents, but would be welcomed on the score of the mud-splashing nuisance equally by the cyclist and pedestrian. Due respect for the feelings of others

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Parsons Non-Skids always Grip. Carry them on your Car and be ready for all conditions of road surface.
Attached in two minutes, taken off in one.
Cannot damage tyres.

Parsons Non-Skid took the Vauxhall Car successfuly through the vast sandy Russian Steppes during the St. Petersburg-Sebastopol Reliability Trial. They took Shackleton to the South Pole. 408,694 were sold in the United States of America last year.

PRICES:
For Tyres 760 mm. or under, £3 per pair.
For Tyres 800 mm. to 920 mm., £4 per pair.
For Larger Sizes, £4 10s. per pair.

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THE PARSONS RAPID REPAIR KIT

solves the problem of easy, quick and cheap puncture repair. Four simple operations only are necessary:—(1) Take out damaged part of tube. (2) Punch hole clean. (3) Stretch and insert plug. (4) Compress—and the repair is made. Once compressed, the plug can never leak or come adrift, neither can it harm the tyre.

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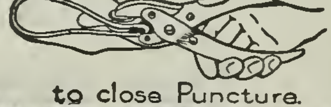

Compressing Plug to close Puncture.

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obliged to frequent the streets under less favoured conditions to that of the car owner, would do much to remove the prejudice which has rightly and wrongly been engineered against the motorist by a considerable section of the community.

"Here and There."

Mr. W. Wilkinson, joint secretary of the T.A.C., who, it will be remembered, met with a serious accident in a recent motor contest, has resumed his duties, and his genial personality is welcomed back among his host of motorist confreres.

* * * *

The exodus of motorists from the Rand to the coast and other parts has been responsible for a depression in the local industry which is still very pronounced.

* * * *

A very striking type of car may be seen at present on Johannesburg streets. It is a new 20-60 h.p. Vauxhall, "Prince Henry" type, imported by the local agents for this make, and has an astounding turn of speed. In addition to the comment its unique design has created from the point of view of the man in the street, its appearance has caused something of a sensation in well-informed racing circles.

* * * *

The local agents for the "Sunbeam" are profiting by the success of this famous machine in the recent Grand Prix. Their remarkable performances against the pick of Europe, however, merely served to enhance the reputation which the "Sunbeam" has already established in South Africa.

* * * *

The registration number on many cars in use in Johannesburg, it will be noticed, is being expressed in four figures, significant of the popularity to which the car has attained. There are several numbers on the Municipal register, however, against which no name appears, and the latest registration number, therefore, is no criterion for the total of cars in service.

* * * *

The attention of the authorities might be relaxed somewhat in regard to trapping motorists, and some of their superfluous energy find an outlet, with a view to suppressing those owners of cars and cycles who run the gauntlet sans lights considerably after sundown. Nor is the motorist the only culprit in this matter, drivers of horse-drawn vehicles being equally offending.

* * * *

Parts of the Johannesburg-Pretoria road are undergoing some long-needed repairs, and, it might be suggested, were the Pretoria Works Department to set apart a sum for the tar macadamising of this highway, the maintenance, so far as the surface is concerned, would appreciably lessen; the capital city would considerably benefit by the undertaking, in the shape of increased popularity; and unstinted praise from among the motorist ranks would crown their effort.

* * * *

It is hoped that much good will result from the advice and suggestions which prominent motorists, and those immediately identified with the S.A. motor industry visiting the United Kingdom at the present time, intend impressing upon manufacturers in regard to Colonial requirements. This is a matter of the utmost importance, especially in utility vehicles for service in this country, as the type best suited for travelling over unmade roads and surfaces with marked inequalities, it would appear, is not yet altogether clear to the manufacturer.

* * * *

Motorists appreciate to the full the excellent network of roadways the Johannesburg Municipality are at present engaged upon in an eastern direction, miles of parallel streets and their respective intersections having been metalled, rolled, and macadamised to the very acme of perfection. The roadways situated more centrally, however, in parts lie in sore disrepair, and the many formidable spring snapping potholes which abound are in striking contrast to the surfaces of the streets just referred to.

* * * *

Berlin, which already forbids smoking by drivers of horse cabs and taxicabs, is about to extend the no-smoking regulation to all chauffeurs. The German authorities are possessed of the idea that, in busy cities at least, the practice of smoking diverts too much of a driver's attention.

* * * *

New York City's already formidable equipment of motor propelled fire-fighting apparatus was increased recently by the installation of two 75-feet aerial ladders.

* * * *

The London County Council have succeeded in inducing a Select Committee of the House of Commons to pass a clause in a Bill before Parliament giving them power to run tramway trailer cars in the street. This, it is interesting to remark, was accomplished in face of the strongest possible opposition from the police authorities, who declared that the use of trailers would render the regulation of the traffic almost impossible.

* * * *

Quite a number of motorists are using benzol with satisfactory results, and being much cheaper than petrol in the ordinary way, and apparently as effective, should render an invaluable service in these days when petrol charges rule so high.

The result of a special study of South African road conditions:

CONTINENTAL

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Use them and avoid all tyre troubles.

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Mining Journal,
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ESTABLISHED 1891.

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Notes and News.

The Daspoort-Rietfontein Line.

In discussing the claims held under prospecting and diggers' licences, etc., in the various districts of the Transvaal, we last week drew attention to the fact that properties in the Heidelberg district were evidently being held on to, and that there were indications of renewed prospecting activity on the southern limb of the Witwatersrand Gold Fields. We now learn that the whole Daspoort-Wilgepoort-Tweefontein-Rietfontein line is being opened up again, that a large number of claims have been repegged, and that on one farm—Rietfontein—a 5-stamp battery is about to start work. German capital is said to be largely responsible for the activity. This resuscitation of the "southern Heidelberg" goldfields may be also in some measure due to the efforts of Mr. Humphrey Hayes, late manager of the Luipaardsvlei Estate, who, it is known, has been endeavouring to interest London capital in this area. That there are auriferous reefs lying to the south of the railway between Heidelberg and Greylingstad has been known for a very long time. Numerous attempts have been made to work these areas at a profit, notably by the Coronation Syndicate, the British Transvaal Mines, the Daspoort Main Reef Company, Mr. E. Brayshaw, and, more recently, by Dr. Carl Peters' South-East Africa Company. Eight years ago the Daspoort Main Reef created a mild sensation by publishing assay results of 6 ozs. per ton from a borehole core, but, as yet, these rich promises have failed to materialise. It may be that under other auspices the Daspoort-Rietfontein line of country will justify the predictions that have been made regarding it. At any rate, it seems that the area in question is to have another trial.

* * * *

The Voorspoed Closing Down.

The decision of the board of directors to close down the Voorspoed diamond mine removes from the list of active mines in the Orange Free State a noteworthy name, and renders the Kroonstad mining area to-day a virtually silent field. As announced in the official notice appearing elsewhere in this issue, the directors have under consideration the disposal of the company's assets. There are, we know, important negotiations proceeding for the transfer of the property, but we are not at present at liberty to say anything more than this in regard to the future status of this property. The Voorspoed company was registered in 1906, after preliminary prospecting operations had disclosed the presence of a large diamondiferous pipe. First results were very satisfactory, but latterly the returns have greatly fallen off, and the last report stated the recovery (for the year 1911) at 14·1 carats per hundred loads, as against 16·62 carats in 1910. The accounts presented at the end of April showed that for the twelve months the company made a working profit of £21,841, whilst the sum of £19,826 was written off on account of depreciation. Whether, under other arrangements, the company will be able to record better results or not, remains to be seen. The mine is admittedly a low grade proposition, but with its large claim area, and the present satisfactory position in the diamond market, it would appear that there are good prospects of the mine again becoming productive.

* * * *

Southern Rhodesian Ranching.

Ranching in Rhodesia is making excellent progress, and we learn that in addition to the Liebig Company, which has taken up large blocks of ground in Southern Matabeleland, the Anglo-French Company, which also owns big areas in Southern Rhodesia, intends commencing ranching operations there on a large scale. The Liebig Company is constructing a main road from their farms to the Limpopo, and when the Pietersburg—Messina line is extended from Bandolier Kop to the Rhodesian border, it is possible that the ranching companies operating in Matabeleland will utilise this as a more direct route for marketing produce and getting up material for the construction of factories, etc., than the old route via Bulawayo. The Southern terminus of Rhodesian Railways is at the West Nicholson mine, 120 miles south of Bulawayo, and the linking up of the Rhodesian and Union Railways systems over the Limpopo is obviously merely a matter of time, although no doubt the construction of such a link will receive opposition in certain quarters. No mineral deposits of importance have as yet been proved in the area lying between the East Gwanda mines and the Limpopo River, and it seems probable that the ranching companies will be the principle factors of industry in securing the linking up of the Rhodesian and South African systems. Mr. Gunther, the chairman of the Lemco and Oxo Companies, is now visiting South Africa, and it is probable that his visit will be attended with important results.

* * * *

Cold at Cape Town Docks.

The gold discovery at the Cape Town docks, about which so romantic a story was given in the local newspapers, appears, on analysis, to be worth about three grains to the ton. The experience of the prospector " from the north " has not served him well. It would have been quite as interesting, and not less truthful, if he had announced a discovery of gold in the surrounding sea water.

* * * *

A Centrifugal Slime Separator.

L. C. Trent, of Los Angeles, California, has devised an interesting and ingenious centrifugal apparatus for the separation of slime, which is illustrated in the last number to hand of *The Engineering and Mining Journal*. The use of the centrifugal principle for this purpose has, doubtless, suggested itself to most engineers who have had occasion to consider the mechanical side of the subject, and the apparatus referred to, which, however, does not appear to have been actually constructed and experimented with, should provide inventors with some useful suggestions.

* * * *

Administration Expenses.

The three great Alaska mines upon Douglas Island have long been famous for their low scale of working costs. It is interesting to find that this low rate does not only prevail in the matter of mining operations, but in that of supervision and organisation. The cost of mining depends, of course, upon the width of the ore body and other considerations; the cost of control depends largely upon other considerations. The operating costs at the Alaska Mexican for 1911 were $1·7481 per ton milled, and included therein are General Expense, Douglas Island ·1259; San Francisco Office Expense, ·0170; London Office Expense, ·0031; Paris Office Expense, ·0005; total under these heads, $0·1465, say, 7·3 pence per ton milled. The latter quantity amounted to 236,383 tons.

* * * *

Modder B.

The excellent state of affairs prevailing at the Modderfontein B. mine continues to engage much attention, and during the early part of the week the shares registered a sharp rise. The profit for July was £36,000, and there can be no question that the property is looking very well. Taking the monthly returns as declared in the April, May and June reports, the profit for the last quarter was £91,719, whereas the amount earned for the first three months of the year was £71,081. This substantial advance in earning is one of the brightest features of the industry to-day, and it is clear that the Modder B. is destined to become one of the most noteworthy and profitable of all the mines on the Witwatersrand. We learn that nothing definite has yet been agreed on regarding increased equipment, but we understand that the matter is receiving the earnest consideration of the Board, and that some pronouncement as to future milling policy may be made at an early date. It would seem that the company is likely to mill ore of a lower grade in the future than has been put through the battery in the past, but, by means of operating on a much larger scale than at present, the profit will increase greatly. We can call to mind no other instance of a Rand mine attaining to such a highly satisfactory position within nine months of the commencement of crushing as has the Modder B.

* * * *

The Village Deep.

The ore milled at the Village Deep last month was 52,000 tons, a record for the company, and an achievement particularly worthy of mention. The maximum capacity of the present equipment was fixed at 50,000 tons, and until within the last year or year and a half the tonnage was never above 45,000 per month. Underground development work is proceeding apace, and with satisfactory results. In the Turf Mines section three levels have been driven—the 16th, 17th and 18th, and the 19th has now almost been reached. In the bottom of the mine the dip is still high—about 40 degrees—and there are no indications of flattening. The new Whiting hoist is in use at the Turf Mines, and the electric man hoist at the same shaft is ready for work.

* * * *

S.A. Institution of Engineers.

Congratulations to the South African Institution of Engineers on the successful formation at Kimberley, last week, of its first branch. A report of the proceedings appears elsewhere in this issue, from which it will be seen that one of the objects which the Council of the Institution has kept in view is the establishment of branches of the Institution in the important centres of South Africa. It is believed that the Kimberley branch will be followed very shortly by a second in another centre. The desirability of forming active branches will be obvious to all members; there will be a much better professional feeling engendered amongst engineers in all parts of South Africa, and aims which are common to all centres will be more easy of attainment when these branches are in full working order. The Council of the Institution felt that there were many ideals which could not be successfully striven for until all the engineers throughout the Union were welded together into one homogeneous body, working for common ends. The Institution does not expect these branches to be immediately self-supporting, though nothing but good can result from the discussion of problems, at meetings in numbers of centres, by members who will view the same problems from very different standpoints. When the branches are in full working order it is proposed that the annual general meeting of the Institution shall be held at a different centre each year until each centre has been thus visited.

* * * *

Central Mining.

The directors of the Central Mining and Investment Corporation, Limited, announce an interim dividend of 6s. per share (free of income tax). This is in accordance with the board's intention to declare dividends at the rate of 5 per cent. per annum, and to distribute any profits exceeding this amount by way of a bonus.

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Lord Harris on Directors' Fees.

The subject of directors' fees obtruded itself at the Gold Coast Amalgamated meeting in mail week. It was pointed out that the shareholders are getting no dividend, but that the directors were drawing £2,000 a year in fees, and had been doing so for more than a decade past. It was suggested that the board should forego their fees, and, like the stewards in the old comedies, work for nothing. This, however, Lord Harris positively declined to do, and his lordship was right. A public company is not a benevolent institution, and shareholders cannot expect that directors will come to the City and devote time to their affairs without getting that hire for which there is the best authority for saying that the labourer is worthy. As to whether the hire is too much is a debatable question, but that any shareholder should expect a board of directors to work absolutely without remuneration is unreasonable, and, it may be added, unjust. Lord Harris put the case quite clearly when he said in effect: " I appraise my services at so much; if you do not choose to have them at that price I am quite willing to retire and make room for those who will do the work at a cheaper rate. If, however, I remain, I must be paid that which I think I am worth." This was a clear issue, and, put in such a way, the shareholders, in effect, unanimously asked Lord Harris to continue his services on their behalf.

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East Rand Proprietary.

The secretary of the E.R.P.M. sent the following cablegram to London recently:—The salient points of the results of the last quarter's operations, issued in Johannesburg to-day, are:—(1) A working profit of £285,876, of which £50,798 has been reserved for profits tax, debenture interest, etc., and £60,032 for expenditure on authorised votes. (2) The cash position at the end of the quarter after providing for the payment of dividend No. 14, shows a credit balance of £47,211. (3) The development amounted to 14,270 ft. of an average width of 26 ins., with an average assay value of 11·2 dwts. (4) The balance to the credit of development redemption account amounted to £70,519.

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Important New Flotation.

The flotation of the British and French Trust, Limited, whose prospectus appeared in mail week, brings into being a company with a very varied assets-schedule. With mining claims on the Rand—east and west of it—and in the outside districts of the Transvaal, coal rights in the Standerton and Bethel districts, iron properties in the Middelburg district, and agricultural and township holdings at other points in the Province, the Trust sets out with plenty of material to work upon, and brings under one roof and one administration the results of selections made over a series of years by Mr. J. C. A. Henderson, whose association with South Africa has been long and intimate. In addition to its South African interests and properties—which are stated in the prospectus to have cost upwards of £270,000—the Trust begins business possessing twelve several concessions in West Africa, upon sundry of which gold reefs have been located and proved. There are also options on several other West African concessions under consideration, "reports on which give encouraging indications of crude oil and coal."

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Swaziland Railway.

The reconstruction work on the Swaziland Line is being restarted immediately, and the line will be carried forward to Gobo by, it is hoped, the end of August. With Gobo as the terminus, riders of transport from Swaziland will be able to do the journey all the year round, until such time as the present Swaziland Railway becomes part of the main trunk line through the Protectorate into the Transvaal. It has already been decided by the Swazi Tin Mines to send out all their concentrates by this route, the agent at Mailana having contracted for fifty tons per month.

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Gold Movements.

Compared with the previous month the imports of gold into England during June showed a considerable falling off, and as at the same time exports expanded considerably, the figures were not far from an equilibrium, imports totalling £3,688,000, against exports of £3,350,000. As regards the imports, movements in refined gold and in coin were quite negligible, and raw gold from the mines accounted for £3,539,000 of the month's total. The shipments from the Transvaal were some £200,000 larger, at £2,797,000, while from Rhodesia £189,000 was received, from India £184,000, and from West Africa £91,000. The last-mentioned item, though showing a substantial increase as compared with June, 1911, is much below the figure for May last, and there is also a further heavy drop in receipts from Australia, which figure at only £16,000. The increase in exports is largely due to the German demands in connection with the mid-year settlements, which were especially heavy on this occasion, and different in character. The current returns complete the figures for the first half of 1912. During that period imports amounted to £24,810,000, or practically the same as in the first half of last year, but exports, at £19,533,000, show an expansion of just upon four millions sterling. In the half year, therefore, there has been a net gain of £5,277,000, which compares with a gain of £8,733,000 in the corresponding period of 1911.

TOPICS OF THE WEEK.

THE REEF STOREKEEPER AND THE SHORTAGE OF NATIVE LABOUR.

Shortage of native labour on the Rand has been so exploited by journalists and correspondents that the public has become nauseated, but as we have lately become possessed of information which throws a somewhat fresh light on the subject, we are emboldened to return to the question. It has come to our knowledge that there are compound managers who—to resort to the vernacular—"work in" with storekeepers in the neighbourhood of the mines with respect to collection of debts of natives. In this way the storekeepers are enabled to give credit to their native customers, as, by arrangement with the compound manager, they are kept advised of what the native is earning, whether he is working or loafing—in short, to what extent he is safe for credit. Indiscriminate credit is at the root of much financial embarrassment, and nowhere is it more dangerous than when given to natives. The native is naturally prone to give way to the blandishments of a white man, who offers him such goods as his heart desires and who does not ask for cash. It is like getting things for nothing, in his mind. He thinks not of the day of reckoning, or, if it does occur to him, he puts it aside. "Eat, drink and be merry, for to-morrow we die," is the motto of these children of nature. They are working where death stalks amongst them; careless of the future, they live only in the present. It is not to be expected that the storekeeper will sell on credit on the same terms as for cash. He runs the risk—not a big one, but nevertheless a risk—and the native is charged "through the nose" for his goods. Then comes pay day, the storekeeper is present with his accounts. With the assistance of the compound manager he collects these accounts, and it is not his fault if the native has much more to draw than he already owes. It becomes a hand to mouth existence. With the exorbitant prices charged for bad liquor, and the equally high prices charged by the storekeeper, the native eventually leaves the mine with very little, if anything, to take to his kraal. Will that native come back, or recommend the mine to his brothers as a satisfactory means of becoming possessed of any cows, and therefore wives? It would be interesting to know what proportion of the native labour is composed of "recidivists."

REDUCTION OF RAILWAY RATES.

Details of the final portion of the revision of railway rates, involving £335,000 of the £750,000 promised, were announced this week. In his Railway Budget speech some months ago, Mr. Sauer announced that it was contemplated to reduce rates to the extent of £750,000. The reductions which came into effect on the 1st instant account for only £415,000. When announcing in Parliament the main features of the alterations, Mr. Sauer explained that it had been found necessary to defer the introduction of the revised port rates and classification, owing to the unfortunate delay which had occurred in arriving at a settlement with the Portuguese authorities, to whom the Union owes certain treaty obligations under the Mozambique Convention, dated 1st April, 1909. A further meeting of the Joint Board established under Article 26 of the Mozambique Convention was held at Lourenco Marques on July 31st; and the respective delegates on the Joint Board have successfully devised a satisfactory settlement of the problem before them. Regarding alterations operating from the 1st August, these reductions are mainly local in character, and are not calculated to affect the relations of the South African Railways with other Administrations to any great extent. Expressed in money, the alterations under review are as follows:—Surrender of revenue per annum: (1) S.A. coal, native timber, stone, clay, earth, land and other rough minerals, £303,000; (2) rebate of one shilling per 2,000lbs. on S.A. coal shipped oversea as cargo, £20,000; (3) reduction of charge for services at private sidings, £50,000; (4) reduction in rates for conveyance of sheep and other "small animals," £30,000; (5) reduction of rates for S.A. cement,

£12,000; total £415,000. The predominating proportion of the coal trade for local consumption, that is, excluding shipment coal, is from the Witbank district to the Witwatersrand coal mines, and the general effect of the new rates is to afford a reduction of one shilling and sixpence per ton on this traffic. It is this reduction of 1s. 6d. per ton on the three million tons of coal in the Transvaal which accounts for the bulk of the loss of revenue involved. The present reduction in the coal rates will facilitate the reduction of working costs of the gold mines and thus tend to the greater development of low grade propositions, which will widen the spheres of employment, and conduce to general prosperity. The heavy reductions for very long distances, instead of causing loss of revenue, will create new traffic and thus bring new revenue into the railway coffers. People in the Cape Province who formerly used wood, owing to the high cost of coal, will now be able to buy coal; they will gain, the Railways will gain, and the country will gain. For long distances, S.A. cement will be charged at the new mineral rate. The object of this change will be greatly to enlarge the markets available to the factory at Daspoort, near Pretoria, engaged in the manufacture of cement. Instead of being restricted to the Witwatersrand market, the South African factory will be able to oust the imported article from markets near the coast hitherto closed to it. In fact, it ought to be possible for the local cement to compete with the imported article at the coastal towns. Of the further reductions announced this week, the effect, plainly, will be for good. Building material, which, as Mr. Alexander Aiken showed some years ago, in a paper read before the British Association, contributes so largely to the high rents prevailing on the Rand, will suffer a sensible diminution. All the reductions specified are, of course, welcome, and our only regret is that they are not more substantial. Much has yet to be done before "business principles" come into their kingdom in South African Railway finance, but we suppose the Rand, for the moment, must rest content with small mercies.

PRECISION IN MINE REPORTS.

Certain technical critics clamour, we think, too loudly for uniformity in mine accounts and precision in the use of words which are intended to convey an exact technical meaning. Objection to the word "payable" and insistent advocacy of "profitable" in its place is, after all, splitting straws. Similarly, the substitution of slime for "slimes" and sand for "sands" is not of any real importance, and we feel sure that whether the singular or the plural is used the outputs and dividends of mines will not be the least affected. Objection to the word drive as a synonym for "drift" is puerile. There are many words which might spoil a page of Dickens or Thackeray or Scott which have come to possess a definite expressive value and usage in mining technology, and to rule them out of mine reports because they are "illiterate" is so much waste of time. That more definite expressions and figures are required in regard to ore tonnages and also to the profit resulting from productive operations is indisputable. The Institution of Mining and Metallurgy has done much towards securing a better understanding in these matters, but admittedly a great deal remains to be done. A step in the right direction has been taken by informing shareholders in the Village Main Reef Gold Mining Company what the "nett resultant profit" per ton milled amounts to, the net resultant profit being the ultimate profit available for distribution. We know too that many European shareholders have welcomed expression of estimated recoveries and of assay values of ore reserves in terms of pounds, shillings, and pence, rather than ounces, or pennyweights, or grains. The latest practice of the Central Mining Group in recording reserves in tons of an average gold content is commendable, and we would like to see it adopted by the other groups operating on the Witwatersrand. Such practice tends towards a better understanding of the actual position at the mine. But on the other-hand, we do not imagine that shareholders are likely to be much enlightened by the use of drift instead of drive, or of slime instead of slimes. Continually to labour and agitate for these alterations when really important problems in mining require consideration is mere misdirected effort.

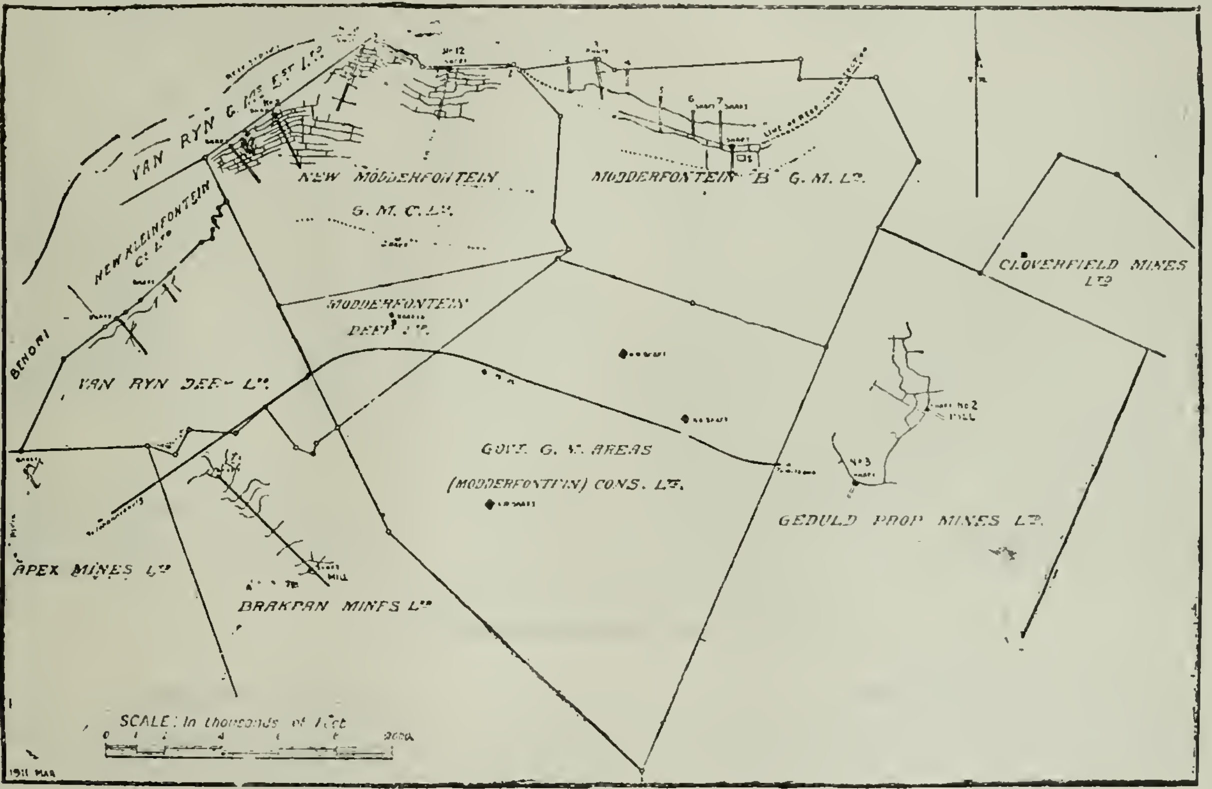
MINING STUDENTS ON STRIKE.

The "third year miners" at the South African School of Mines have earned the distinction of having promoted, aided or abetted, or unconsciously been the cause of what the *Leader* very properly terms "a strange and Gilbertian state of affairs." They refused to hand in, as requested, copies of their lecture notes, and were supported in their action by a large number of, if not all, the other students attending the school. The result of the breach of discipline, and the sympathetic feeling of the students not directly concerned was that a strike was decided upon and promptly carried into effect. The equally decided and apparently more effective action of the school authorities, who suspended the recusants and followed it up with an ultimatum in unambiguous terms is much to be commended, while the sympathetic strikers are to be congratulated upon the modicum of common sense which enabled them to recognise that they had made a foolish mistake. It is said that the matter has not been done with, but that a breach of trust has been committed by the authorities in their refusal to discuss the grounds of complaint with the Students' Representative Council. This is doubtless the Gilbertian aspect of the affair, as it appears to our contemporary, for it is unquestionably humorous that the students should first of all commit a breach of discipline and, having inaugurated a strike, venture to propose a discussion, as if by right. It is regrettable that relations should have become strained between the head and those who attend his lectures, and it is much to be desired that an amicable settlement of all differences will be arrived at, as a result of goodwill and fair words on both sides. What appeals to us upon a calm and unbiassed review of the whole affair as the question of outstanding concern is the behaviour of the "third year miners" in the face of what seems to be a perfectly legitimate and by no means uncommon demand. It throws an unfavourable light upon the purely mental no less than upon the ethical standpoint of these miners, which is not calculated to inspire confidence in the minds of those who, from outside and not uninfluential quarters, are watching their progress. A request for intelligible and more or less adequate notes upon the lectures delivered indicates that the lecturer is anxious to satisfy himself that his audience, individually and collectively, are not wasting his valuable time nor defeating the object for which they were sent to the school. The refusal to comply with what was undoubtedly a reasonable and easily understood demand suggests to us, and doubtless to most people, that there was abundant justification for making it. The public who are employers and who know something of examinations and diplomas, will be led to scrutinise very carefully the credentials of students who consider it a matter of dignity, or let us say prudence, to contend for the right to withhold their lecture notes, and in days like these, when the professional market is crowded with successive batches of embryo consulting engineers, mine managers, metallurgists, *et hoc genus omne*, a reputation acquired in school days for solid, genuine and thorough work is not one that is to be lightly regarded. The South African student, for some reason or another—whether it be the enervating influence of the climate or some inborn disinclination for mental or physical effort which is the characteristic of the white race in this country, or whether, finally, it be the all-pervading desire for distinction in "sport"—is considered to be, on the average, an unsatisfactory subject to handle in the classroom, and such "a strange and Gilbertian state of affairs" as has recently been paraded at the School of Mines is calculated to confirm and intensify the opinion. Students who begin their career handicapped by a reputation of this kind are at an immense disadvantage, and if the "third year miners" who have precipitated the strike at the South African School of Mines can be induced to consider this aspect of their achievement they will give proof of that ordinary everyday wisdom which is no less essential to the advancement of professional men than it is to that of the aspiring office boy.

IMPORTANCE OF THE MODDER DEEP STRIKE.

Significance of the Excellent Shaft Assays—Cheap and Easy Mining—What Results Mean to Surrounding Properties—Finances of the Company—Economical and Rapid Shaft Sinking—Novel Arrangement of Shafts—Some Conclusions.

The outlook for the further East Rand is particularly rosy at present. Simultaneously with the announcement of the earning of a record profit at the Modder B. mine, and the notification of almost equally satisfactory earnings by the New Modderfontein, Brakpan Mines, and Van Ryn, comes the announcement that the Main Reef series has been encountered in the No. 1 shaft of the Modderfontein Deep Levels Company at a depth of 2,990 feet. The dip to the south is in the neighbourhood of 11 degrees, and the assay results are excellent. According to the official statement, the reef series consists of hanging wall leader, value 21·88 dwts. over 27·9 inches, including partings, followed by 31 inches of waste. The middle reef assays 23·78 dwts. over 6 inches, and is separated by 22·6 inches of waste from the footwall leader, the latter being 39 inches wide, including partings, and assaying 7·26 dwts. per ton. The average of the whole body, including waste, is 126·5 inches wide, assaying 8·81 dwts. per ton. The deepening of the shaft and the cutting of the station are in hand, and will take about two months to complete. It was anticipated that the reef would be cut at a depth of about 2,750 feet, so that the ore body lies between two and three hundred feet deeper than was expected. The outstanding feature of the strike is the great width of the reef—10 feet 6½ inches. With sorting a recoverable value of approximately ten dwts. per ton is indicated.


VAN RYN G. M^s. E^ST L^TD
NEW MODDERFONTEIN G. M. C^O. L^TD
MODDERFONTEIN "B" G. M. L^TD
NEW KLEINFONTEIN C^O. L^TD
BENONI
MODDERFONTEIN DEEP L^TD
VAN RYN DEEP L^TD
CLOVERFIELD MINES L^TD
GOVT. G. M. AREAS (MODDERFONTEIN) CONS. L^TD
GEDULD PROP MINES L^TD
APEX MINES L^TD
BRAKPAN MINES L^TD
N^o 12
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SCALE: In thousands of feet
0 1 2 4 6 8 2000
1911 MAR

Map of the Four Modder Mines, showing situation of Modder Deep.

Work was started in 1910. Two shafts are being sunk close to one another, only about 100 feet apart. This is according to the style of operations conducted in some of the German coal-mining enterprises. Connection has been made between the two shafts at 700 feet and 1,400 feet and will be made at the bottom. Great advantages will accrue tor ventilation of the mine and safety exit for those employed underground.

Neighbouring Mines.

Reference to the map shows that the Modderfontein Deep Levels property lies on the dip of the New Modderfontein, adjoins Van Ryn Deep on the east, and has as its neighbour on the south the Government Gold Mining Areas. The eastern apex of the ground of the Modderfontein Deep Levels abuts on the claims of the Modder B. Company. It will thus be realised that the mine is in most excellent company. In fact, it is in the rather unusual position, for a mine which has only just cut the reef, of being surrounded by four mines, in all of which the reef has been opened up. The New Modderfontein and Modder B. are producing and earning large profits, the Van Ryn Deep is in an advanced stage of development, and in the Modderfontein Government Areas the reef has been cut in one shaft and the others are nearing the ore body.

Moreover, the position of the Modder Deep between the New Modder and Brakpan, and the reef conditions obtaining in these properties, justify the belief that the section disclosed by the shatt is not by any means an isolated one, and that similar values may reasonably be expected to prevail over a considerable portion of the company's ground.

Careful Assays.

The necessarily brief official statement may be supplemented by some further facts. It is known that the utmost care was devoted to the sectional assay of the reef in the shaft. No less than 73 assays were taken, and a striking feature is the great uniformity shown. There is a welcome absence of erratic or "freak" assays.

Easy Mining.

The mining width, estimated on the basis of the shaft assays, obviously lends itself to cheap and easy mining. Mining will be further facilitated by the fact that the mine extends along the strike rather than on the dip, and can, therefore, be easily developed, laterally, by means of its twin shafts.

Excellent Shaft Sinking.

Plainly, very rapid shaft sinking has been done. More than one record was broken in the course of the work, and the result is that the No. 1 shaft has been sunk 2,930 feet in twenty-one months—the first 60 feet, done by hand drilling, being excluded. Moreover, the actual cost of shaft sinking is well under the estimates. As the official statement explains, some time will elapse before the necessary work of station cutting can be completed, and doubtless it will be more than two months before further details of development are available.

The Financial Position.

The financial position is eminently satisfactory. The company has still in hand a sum of £125,000 with which to pursue work. The capital is small, thus facilitating the issue later on of the further amounts required to equip the mine. It will be remembered that options on 100,000 shares to Messrs. Goerz and Co. at 55s. ran off, unexercised, on June 30th last. The capital of the company, therefore, stands as follows:—Old capital, 100,000 shares; 1910 issue at 45s., 150,000 shares; payment for Kitzinger block, 13,000 shares; total, 263,000 shares. Assuming a dip of 11 degrees and a milling width of, say, 99 inches, going 10 dwts., we get a possible total tonnage of 15,300,000 tons in the area of 377 claims with total gold contents of £32,488,500, after making allowances for dykes and disturbed ground. These calculations are necessarily more or less hypothetical, as they are based on the disclosures in the shaft alone and the assays and widths there discovered may or may not be maintained throughout the property. The foregoing estimates are, however, of much interest and not a little value, indicating as they do the great potentiality of this, the latest mine to enter the development stage on the Rand.

Some Technical Details.

It is interesting to recall that the plans prepared for the opening up of the mine possess at least one very interesting and novel feature. Instead of adopting what might seem the more obvious course of sinking one shaft and connecting up underground with the nearest shaft of the Modder State Mines, it was decided to sink twin shafts, each of three compartments, at a distance of about one hundred feet apart. This course is a novelty on the Rand, but is not unknown elsewhere, and there are in the present instance many obvious advantages attaching to it. Had but one shaft been sanctioned, and the future of the mine left to depend on the possibility of an early connection being made with a "State Mine" shaft, certainly a saving in capital expenditure of approximately £28,000 would have resulted. Against the saving, however, would have to be set the fact that the mine would have been dependent on the favour and goodwill of its neighbour, that development would have been restricted in comparison with what is possible with the two shafts, and that when it came to arrange the ventilation scheme with its neighbour, the single shaft might have to act as the upcast shaft for the whole of its own and many of its neighbour's workings. The system of twin shafts adopted, on the other hand, will permit of rapid development of both sides of the property; will facilitate and make for an excellent ventilation system; and will ensure the non-stoppage of surface operations in the event of breakdown in one shaft. The twin system of shafts adopted has several other special advantages. As the shafts are but 100 feet apart, it has been possible to concentrate the haulage engines and boiler plant between them, and to save much of the expenditure demanded by shafts separated by a greater distance.

Conclusion.

Making all allowances for the extent of reef tested, it is no exaggeration to state that the Modder Deep shows promise of a big future for itself and the whole East Rand.

City and Suburban.

The following are the results of this company's operations for July, 1912:—Tons milled, 28,091; gold recovered, 12,357 fine ozs.; profit, £22,003.

Brakpan Mines.

The following are the particulars regarding the July output of the Brakpan Mines:—Stamps working, 150; running time, 30 days; ore crushed, 56,180 tons; tube mills working, 6; ore hoisted, 64,332 tons; ore from dump, 1,441 tons; waste sorted, 16·03 per cent.; fine gold declared, 21,300 ozs.; value declared, £89,608; equal to 31s. 11d. per ton milled; working costs, £48,531, equal to 17s. 3d. per ton milled; working profit, £41,077, equal to 14s. 8d. per ton milled.

Jumpers-cum-Treasury.

The following is the result of the joint working of the Jumpers and Treasury mines during last month:—70 stamps, working 25 days, crushed 7,000 tons, yielding 2,018 ozs. fine gold from mill, 1,019 ozs. fine gold from tailings by cyanide, 271 ozs. fine gold from current slimes, and 278 ozs. fine gold from accumulated slimes; total from all sources, 3,586 ozs. fine gold. Value of the output, £15,062. Joint profit for the month, £1,522. Position of joint gold reserve at end of last month, 880 ozs. fine gold.

Komati Mines.

Notice is given that an extraordinary general meeting of shareholders in the Komati Mines, Ltd., will be held at the registered office of the company, 133 and 134 New Stock Exchange Buildings, Johannesburg, on the 8th day of October, 1912, when the subjoined resolution will be proposed:—That the capital of the Company be increased to £16,000 by the creation of 4,000 additional ordinary shares of £1 each ranking for dividend, and in all other respects *pari passu* with the existing ordinary shares in the company.

The Tin Fields.

According to the *Northern Star*, Colonel Scoones, M.I.C.E., of the Nigeria and Waterberg Tin Company, returned from the Rand on the 24th, calling *en route* at Solomons Temple Tin Mines. He cabled to London as follows: "Having inspected mines now paying; property in excellent district; have favourable opinion of examinations I have made, with view of selections of claims; alluvial deposits occur on property, and if time permits will prove." Colonel Scoones will leave for London during the week, seemingly well pleased with his visit. His detailed report will be made in London. The Bellevue Syndicate are now working double shift. Messrs. Powell and Whittaker are on the property.

PROTECTION OF MINING PROPERTIES.

What the Larger Groups are Doing—The Prevention of Theft and Illicit Trading—Modern Methods of Dealing with Crime on Mines.

It is evident that the mining houses are at last awakening to the fact that the responsibility for protecting their properties rests with themselves, and that it is high time they adopted a systematic police organisation. The Government either cannot, or will not, afford sufficient means for protecting "the goose that lays the golden eggs." The whole truth of the matter is that any scheme of the Government to establish systematic policing on the mines would be top heavy, hide-bound with red tape, and vastly expensive. The thing would not be run on business lines—no Government Department ever is. What the mines want is, what some of the larger groups already have—a private enterprise such as Messrs. G. Bush and Co.'s Agency, whose first aim is to give satisfaction to the mines who employ them by adopting a policy making for efficient service without proving irksome or galling to the employees, both white and coloured. Take the case of a mine employee being found guilty of transgressing the provisions of one of the local statutes. Some of these statutes are peculiar to this country, and are not to be met with anywhere else in the world. It may not be morally an offence at all elsewhere, here it is made a serious one by statute. Suppose a Government policeman—to catch that employee—*in flagrante delicto*, he must of necessity take the offender to the charge office and lock him up. He is absolutely bound to do so by the Police Act. But supposing that the same thing occurs, and a private agent catches that employee, he has discretionary powers either to lock him up or let him go. The policy of Messrs. Geo. Bush and Co. is never to take a mine employee to the Charge Office without first consulting the management. As a rule, the management deals with such cases. If it is a white employee and the offence is serious, dismissal follows. If a native, the compound manager deals with the matter. The idea is to keep the natives on the mines, not in the gaols. The same firm believe strongly in the maxim, "prevention is better than cure." They have hundreds of cases every month of vagrancy, pass law, and possession of liquor. The effect of the two former is to discourage all sorts of bad characters from visiting mine properties, and of the latter to make it unsafe to have liquor on those properties which are efficiently policed.

The mines swarm with dealers of all kinds. Travelling jewellers, tailors, cycle agents, cleaners and dyers and the like; among this class are a certain number who resort to the following methods: They strive to get in touch with juniors in the Reduction Works by offering them goods—especially clothes—on advantageous terms; they do not ask for cash or even a deposit, but give credit freely. They do not press for payment for two or three months, but presently the traveller has a friendly conversation with his creditor about payment—making a tentative suggestion about "stuff." If the man demurs, or is strong enough to refuse to entertain such an idea, he quickly receives a lawyer's letter of demand, which, with its sinister threat of "court proceedings," frequently turns the scale in the young man's mind, converting him from an honest man into a thief. For one inexperienced in such matters sees himself haled before a court and condemned to imprisonment for some such offence as "obtaining goods under false pretences"—a threat constantly employed by these travellers to further their own nefarious schemes. Once a man has succumbed to temptation, how easy it is for him to go on; in fact, how difficult to stop, with the tempter at his elbow alternately offering more goods on credit and again threatening exposure of the lapse that has taken place. We believe these methods to be at the root of all the illicit gold dealing on the Rand, from the commencement of the trade. There may be men holding responsible positions on the mines to-day who, owing to some such lapse in their early days, are still tied and bound in the chain of this pernicious system. Could these travellers be excluded from mine properties, or, at any rate, kept under some surveillance, we unhesitatingly assert that illicit gold dealing would sensibly diminish.

Again, take the illicit liquor dealers. The harm done to the industry by bad liquor sold to natives is incalculable. Compound managers have informed us that they could put one per cent. more boys in the mines if it were not for the liquor. It is well known to the police that the favourite method is *traditio in longa manu*, that is, by delivering the liquor to a pre-arranged spot, where it is afterwards collected by the customers. The simplicity of this method is obvious—the dealer and the liquor and the native never come together at the same time. Detection consequently is extremely difficult. Orders are taken by the dealer or his native runner invariably for cash in advance; the liquor is brought to the appointed spot—often an ant-bear hole—and simply left for subsequent collection by the purchasers. The watchman and agents appointed by the mines can do much to break up this style of trade by continually harassing all unauthorised persons found on the properties and, where possible, charging them with trespass, etc. There is nothing a native feels more than losing his money. He may have some doubt about paying in advance for his liquor, but when he has paid and the liquor is not forthcoming, that dealer need not try to do any more business with the same native, and this is what happens very often. The native runner is caught conveying the liquor and gets locked up. It is upon these lines that the present mine police organisation works. Their most strenuous efforts are directed towards the prevention of crime, and afterwards they endeavour to detect crime.

New Vaal River Diamonds.

During July 123 diggers produced 1,860¾ carats of diamonds, which realised £11,772 2s. 6d. Included in this total were the following stones:—1·11 carat at £16 per carat, 1·7 carat at £15 4s. 6d. per carat, 1·13½ carat at £14 16s. 3d. per carat, 1·18¾ carat at £14 13s. 3d. per carat, 1·11 carat at £12 2s. 10d. per carat, 1·17 carat at £11 per carat, 1·10¾ carat at £10 12s. 6d. per carat, 1·4¼ carat at £10 10s. 6d. per carat, 1·55 carat at £10 10s. per carat, 1·12 carat at £10 10s. per carat, 1·31¼ carat at £10 4s. 9d. per carat, 1·36¾ carat at £10 per carat, 1·25¾ carat at £10 per carat, 1·18½ carat at £10 per carat, 1·58½ carat, 1·56¾ carat, 1·30¼ carat, 1·20½ carat, 3·19½ carats, 1·19 carat, 1·18 carat, 1·16¼ carat, 1·15 carat, 1·14 carat, 1·13 carat, 1·12¾ carat, 1·12½ carat, 2·12¼ carats, 1·11¼ carat, 1·11¼ carat, 1·27½ carat.

Ceylon Lydenburg Output.

The following are the details of the output for July:—Tons crushed 767, yielding 199 ozs. fine gold, valued at £2,095. Estimated profit for the month, £1,210.

Transvaal G.M. Estates

The following are the details of the output for July:—Central Mines: Tons crushed 11,850, yielding 7,023 ozs. fine gold, valued at £29,418. Elandsdrift Mine: Tons crushed 615, yielding 686 ozs. fine gold, valued at £2,872. Vaalhoek Mine: Tons crushed 1,430, yielding 437 ozs. fine gold, valued at £1,833. Total value of month's output, £34,123; estimated profit for month, £17,042. The grade of ore crushed during the month was below the average value of the ore reserves.

LATEST PROGRESS REPORTS FROM FOUR GOLD FIELDS' MINES.

Ore Crushed Exceeds Ore Developed—Profits on Low Grade "Deep Deep Level" Ore.

QUARTERLY reports of four producing subsidiaries under Gold Fields control are to hand, from which we make the following extracts:—

THE JUPITER.

THE Jupiter crushed 105,800 tons more than were developed during the quarter ending 30th June, but the quarterly estimate of tonnage must not be taken to include all ore fully or partially developed during the period, as blocks of ground may be held over pending fuller information. The number of feet driven, sunk and risen during the quarter was 2,932, the ore developed 20,500 tons, and the ore crushed 126,300 tons. During April an average of 110 stamps were operated. An additional five were dropped during May and a further five in June. The mill yield was 18,139 fine ozs., the sands works produced 6,714, and the slimes works 5,250 ozs. Working costs were at the rate of 17s. 5d. per ton, including 10s. 4d. mining expenses and 2s. development redemption. Milling costs were at the rate of 9·59d. per ton, and tube milling 1s. per ton. The profit on working carried down amounted to £16,082, or half-a-crown per ton. The amount spent on capital account during the quarter under review was: Plant, buildings, etc., £12,909; shaft sinking, £3,191; development, £10,921. A credit to development of £17,500 for redemption of development has been charged to working costs. At the end of June the gold in reserve came to 250 ozs.

ROBINSON DEEP.

The Robinson Deep Gold Mining Company's report for the quarter ended with June last shows that the "footage" for that period amounted to 4,213. The ore crushed was 153,300 tons, and the ore developed 110,724 tons, the excess ore crushed during the period thus being 42,576 tons. During April 210 stamps were in operation. In May an additional 20 stamps were dropped and in June a further 15. The total yield in fine gold was 57,238 ozs., or 7·467 dwts. per ton. The revenue from mill, tube mills, sands and slimes was £240,011, or 31s. 3·75d. per ton, and the profit or working £105,910. The estimated net profit was £74,520. Working expenses were at the rate of 17s. 6d. per ton, of which mining absorbed 9s. 9·6d. and development 2s. per ton. The amount spent during the quarter, chargeable to additions and renewals fund, was: On additions, £15,965 11s. 10d.; on renewals, £6,180 3s. 7d.; total, £22,145 15s. 5d. In addition to the sum of £7,500 appropriated for additions and renewals fund, an amount of £2,300 8s. 8d., being the value of 548·811 ounces fine gold recovered from the dismantled mill plates, has been placed to the credit of that fund and is not included in the profit for the quarter. The sum of £15,000, appropriated for the payment of the Bewaarplaatsen annuity, represents an amount of £5,000 per month, which your directors have decided to set aside out of profits for that purpose, making a total of £50,337 10s. so appropriated to 30th June, 1912, to meet remaining annuities, and leaving a balance of £210,544 10s. still to be provided. At the 30th June, 1912, the gold in reserve was 3,362 ozs.

SIMMER DEEP.

The Simmer Deep records 2,837½ feet of development for the past quarter. The ore exposed totalled 90,734 tons, but this is a quarterly estimate of tonnage and must not be taken to include all ore fully or partially developed during the period, as blocks of ground may be held over pending fuller information. The ore crushed during the three months was 143,360 tons, so that the excess crushed during the period was 52,616 tons. There were in operation during April 120 stamps, in May 125, and in June 135 heads. The stamp duty was 13·252 tons per day. The total yield was 30,365 ozs., or 4¼ dwts. per ton, and with working expenses 16s. 7d. per ton a profit on working of £8,398, or 1s. 2d. per ton milled was secured. Debenture charges and profits tax are estimated to represent £13,819. Accordingly, although the company is required to pay about £700 on profits tax, there was an estimated loss for the quarter of £3,948—a rather anomalous state of affairs. To the working profit may be added £1,473 "sundry revenue," accruing from transfer fees, rents, etc., On capital account, £10,359 were expended, chiefly on account of development. This is subject to a deduction on account of redemption of development, charged to working costs, amounting to £512.

SUB-NIGEL.

No figures are given in the Sub-Nigel report as to the tonnage developed during the last quarter, it merely being stated that 929½ feet were driven, sunk and risen. There were crushed 13,050 tons by 30 stamps, and the total yield was 5,921 ozs., or 9·075 dwts. per ton. Working expenses were at the rate of 33s. 7d. per ton. The costs include £1,164 10s. 9d. spent on exploratory development, and on capital account £598 was spent in connection with shaft sinking. The profit earned was £2,866, or at the rate of 4s. 5d. per ton milled. The working profit was £2,866, and sundry revenue amounting to £1,031 brought the net estimated profit to £3,897. At the end of June the company held a gold reserve of 500 ozs.

Roberts Victor Diamonds.

During the month of July 1,031¾ carats of diamonds were recovered from 15,758 loads washed.

Glynn's Lydenburg.

The following are particulars of the July output Tons crushed 3,180, yielding 1,917 ozs. fine gold, valued at £8,050; estimated profit for the month, £4,310.

The Sheba.

The following are the returns for July:—Sheba Mine: Mill ran 28 days, crushed 6,500 tons, yielding 3,190 fine ozs.; estimated profit for month, £1,818. Rosetta Mine: Mill ran 1 days, crushed 327 tons, yielding 97 ozs.

Kilo G.M. Co.

Writing to the "East African Standard," a special correspondent says: Kilo, the dream of all prospectors, is very nicely situated, mountains, valleys, small rivers, forests all over, and splendidly laid out. For more than ten years the Belgian Government worked the gold there, and I hear they had in 1911 an output of 32 million francs worth of gold. The whole concern consists of four large camps, and the principal camp is the first that is on the road from Irumu. Here are numerous office buildings, working and repair shops, a substantial stock of machinery, pipes, carts, and everything that belongs to a concern that employs about 10 white people and 3,500 natives. Considering that everything is brought by porters overland everybody has to admit that an enormous amount of work was done during the last few years. Naturally the Belgian Government does not want everybody to settle down there, to prospect there, or smuggle gold, and says officially that any prospecting in the "neighbourhood" of Kilo is strictly prohibited. As Kilo is situated very high, and as all the mountains consist of quartz with a very high percentage of gold, there are numerous small rivers which are naturally full of alluvial gold flowing down.

THE ANGLO-FRENCH CO. AND APEX—BENONI AFFAIRS.

London Board Cables Us an Exhaustive Explanation of its Attitude towards Amalgamation Proposals and Regarding Benoni Troubles.

The following cabled letter reached us on Thursday from the Secretary of the Anglo-French Exploration Co., Ltd., in London:—

To the Editor, *South African Mining Journal.*

Sir,—In the published reports of the proceedings at the meetings of the Apex and Benoni companies, held in Johannesburg on the 3rd and 4th July respectively, which are now to hand, the attitude of the Anglo-French Exploration Company was called in question by several speakers. As my Board are not prepared to leave such remarks unnoticed, I am instructed by them to ask you to kindly publish the following statement. It appears to them desirable that it should be published in Johannesburg in view of the meetings having been held there.

Question of Control.

The first point they desire to deal with is that of the control of these companies, to which reference was repeatedly made by Sir George Farrar and other speakers. I am instructed to state that no control of these companies has ever been vested in my company; their connection with these companies has been that the Anglo-French Exploration Company has been represented by two directors out of six or seven that constitute the Boards, and has also entered into agreements with the companies for acting as their agents in London, and for rendering certain specified services in Johannesburg. The directors so appointed have always taken the greatest pains in assisting and carrying on the management of the companies, but have had no preponderating influence on the Boards. At the meeting of the Benoni company, Mr. Dalrymple illustrated this by referring to the fact that when the consulting engineer of the company, Mr. Way, recommended some time since that, in view of the increase in working costs on the Rand, the pay limit of the mine should be raised from 4½ to 5 dwts., the recommendation was rejected by the vote of the majority of the Board, representing the Jumpers Company, Ltd., and Messrs. Farrar Brothers. It was a matter of surprise to my directors that the board of the Benoni did not see fit to adopt the recommendation of their consulting engineer in such a matter. It is clear that if the pay limit is fixed too low, ore which would not be payable is classed as payable, and it might appear to the shareholders that the mine is in a more favourable position than is actually the case. It will be seen, therefore, that the Anglo-French Exploration Company has not had the control of these companies, even in the sense in which that phrase is used on the Rand. Whether it is a good system that one firm or company should have a preponderating influence in deciding all points regarding the management of a certain property need not be discussed; it has probably worked well in some cases and badly in others. The fact remains that the Anglo-French Exploration Company has never had such control of the management of the Apex and Benoni companies, nor have they ever desired to obtain it. My directors are of opinion that some of those who referred at the meetings to the "controlling house" were well aware that they were using a phrase which was inapplicable to the case, and that the control referred to had no foundation in fact.

Benoni.

My board regret extremely that a company with which the Anglo-French Exploration Company is associated has found itself in such a lamentable position, but they certainly can accept no responsibility for a state of affairs which they have had no share in bringing about. A great deal of stress has been laid on the failure of the Way-Arbuckle process, which was recommended to the Benoni board by Mr. Way, who is the consulting engineer of the Anglo-French Exploration Company, and whose services were by agreement placed at the disposal of the Benoni Company for a suitable consideration, and on certain well-defined conditions. Mr. Way had been consulting engineer to the Benoni Company prior to his being connected with the Anglo-French Exploration Company. My directors have very rarely given advice to their representatives on the board of any company with regard to technical matters, but in this case they did actually warn them, both by cable and letter, of the danger that might arise from a company, financially weak like the Benoni, adopting a new process for a portion of its plant. My board do not feel that they have any ground of complaint against their representatives for preferring to act on the advice of Mr. Way, and voting in favour of its adoption; they are convinced that their representatives, in following Mr. Way's advice, and also Mr. Way in tendering it, acted in what they believed to be the best interests of the Benoni Company. As soon as this part of the plant appeared to be a failure, the representatives of the Jumpers Company and Messrs. Farrar Brothers on the board took up the position that the Anglo-French Exploration Company was legally responsible for the result of Mr. Way's recommendation, and they submitted a case to counsel to ascertain if they had any legal claim, which, they were informed, was not the case. Whilst this proceeding was certainly not calculated to conduce to a friendly feeling, I am to state that my directors have been in no way influenced by it in deciding whether they should or should not join in aiding the Benoni Company financially under present circumstances. They have been influenced by a variety of other considerations which they do not consider it necessary at present to enter into.

Apex.

This company is in a far more favourable position than the Benoni; it is free from debt, and has a far larger property, a considerable portion of which adjoins the Brakpan Mines. It has also a coal property which was stated at the meeting to have returned £300,000 to the shareholders in dividends, which has still a very long life, and which is more favourably situated than any other colliery for supplying coal to the goldfields. The value of the ore that has so far been developed in the gold section is only moderate, and the development has been very expensive owing to water and other difficulties. As the financial resources of the company are exhausted, my board would have been glad to see further funds raised, more especially for developing the property in the direction of the Brakpan, and they suggested to the Apex board a scheme for raising further capital which they were prepared to support financially, but which was not entertained. They also intimated that they were prepared to join in a temporary loan to the company to avoid closing down, pending a scheme agreed upon. The board of the Apex Company, however, decided to close the gold section down, as was recently announced. My board assume that this action is in view of a desire to bring about an amalgamation with the Benoni Company, to which subject I am now instructed to refer.

Apex and Benoni Amalgamation Scheme.

In order not to occupy too much of your space, it is desirable to pass over the pourparlers which took place on this subject before the proposals—of which the particulars were given at the meetings—were brought forward for the acceptance of my board, and declined by them. It may be desirable to state, however, that my board, whilst not objecting to an amalgamation in principle, had stipulated that the value of the assets of the two companies should first be ascertained by an independent engineer. This was agreed to, with the result that Mr. Leslie made a report on the two properties, which has recently been published. My board objected to the proposed amalgamation scheme on the ground that it is not in accordance with Mr. Leslie's valuation of the respective assets, and that the creation of an overwhelming issue of first mortgage debentures would be seriously detrimental to the interests of the existing Apex shareholders. As regards the latter point, it is obvious that a debenture issue of £600,000 against a proposed share capital of £380,000 is correctly described as an overwhelming issue. It is, therefore, only necessary for my board to point out why they do not find the scheme in accordance with Mr. Leslie's estimate of the respective value of the assets of the two companies. Whilst my directors were prepared to accept the estimate as arrived at by Mr. Leslie, they contend that the calculation based on it is vitiated by the method adopted of deducting the Benoni indebtedness prior to estimating the number of shares to which that company would be entitled in an amalgamation. The following would, they believe, be a sound calculation based on Mr. Leslie's figures. The full Benoni assets, without deduction of the debt (amounting to £200,000) should be taken at £976,882, and the Apex assets at £2,253,795. The latter allows £250,000 for the coal property, which was not included in Mr. Leslie's figures. The proportion of shares due to the Benoni would, therefore, be approximately 1 to 2¼, or, on the basis of Apex having 300,000 shares, the Benoni should receive 130,000 shares, *out of which it would have to discharge its own indebtedness.* To illustrate how the scheme to which my board objected would work out in practice, I am to point out the following. Assuming the value of the Apex shares, after amalgamation, to be 25s. per share (the price at which an option was to be given to the guarantors in the scheme put forward), the value of 300,000 Apex shares would be £375,000, whilst the Benoni would have received £200,000 in cash and 80,000 shares of the value of £100,000, or, together, £300,000, as against £375,000 for Apex, *i.e.*, in the proportion of 1 to 1¼, the true proportion being 1 to 2¼. It would appear, therefore, that under the proposed scheme the Benoni Company would be receiving nearly double what it is entitled to. My board were, therefore, unable to associate themselves with a scheme which did not appear to them to be equitable, and which included the issue of a large number of first mortgage debentures, raised partly to discharge the debts of the Benoni and to complete its plant, and for which the only profit-earning security, at all events for a considerable time, would be the coal assets of the Apex. It should be added that about two months ago my directors indicated to the board of the Apex and Benoni companies the lines of an amalgamation scheme which they would be prepared to support. This suggestion, however, was immediately declared by the boards of the two companies to be inadmissible. As stated above, my board does not lay claim to any exclusive control of the Apex company, the board of which can bring forward for the acceptance of shareholders any proposals they think proper. My directors, however, would decline to take part in any scheme which they did not consider equitable, and my company would, as shareholders, vote against its adoption. I am instructed to apologise for the length of this communication, but it could not well be compressed into a smaller space. It has also the disadvantage of being somewhat belated, but the distance between London and Johannesburg has rendered that unavoidable.—I am, sir, your obedient servant,

S. D. THOMSON,
Secretary Anglo-French Exploration Company, Ltd.
London, August 7, 1912.

PROFITS AND MARKET PRICES.

The Sharemarket Fails to Respond to Improved Conditions—An Interesting Comparison.

DESPITE improvements in profits, the erection of new plant, and the generally satisfactory developments that have resulted on the Rand during the past six months, the sharemarket appears utterly to have failed to respond to the betterment. In a few cases, as, for instance, the Modderfontein B, the City Deep, and the Van Ryn Deep, there has been an appreciation in price, but a comparative list of prices, as at the beginning and middle of the current year, shows that, on the whole, market prices have fallen rather than risen. In many cases the depreciation is exceedingly difficult to understand, in face of improved developments underground and the earning of larger monthly profits. A few mines, it is true, exhibit a shrinkage in earning, but the majority of the companies dealt with hereunder, which are typical of the Rand, have improved their positions since the conclusion of last year. The accompanying list shows the prices at the beginning of the current month and sets forth the profits earned in December and June.

	Beginning January.		December Profit.	Beginning August.		June Profit.
Bantjes Cons.	23	9	5,608	22	6	5,527
City & Suburban ...	46	6	17,000	52	6	21,676
City Deep	48	0	18,871	55	0	25,048
Cons. Langlaagte ...	17	6	8,033	22	6	9,654
Cons. Main Reefs ...	16	3	6,500	20	0	11,558
Crown Mines	137	6	109,608	135	0	108,878
East Rand Props. ...	65	6	67,108	58	9	92,256
Govt. Areas	22	3	—	24	9	—
Ginsbergs	28	6	5,611	32	6	6,870
Jupiter	8	6	3,661	10	0	4,860
Knight Central	15	6	3,200	12	6	4,469
Main Reef West ..	24	0	7,278	26	3	11,671
Modder B	54	0	22,340	57	6	30,821
New Kleinfontein ...	27	3	20,114	28	9	23,038
New Rietfontein ...	11	6	3,851	8	0	2,941
New Heriot	96	0	10,024	80	0	9,110
New Unified	18	0	4,779	17	6	5,083
Randfontein Est. ...	33	6	74,000	26	0	73,261
Robinson Deep	55	6	35,356	50	0	32,898
Roodepoort U.M.R ...	22	6	8,042	16	3	3,442
Simmer Deep	5	0	4,554	2	6	4,304
Van Ryn Deep	7	10	—	16	3	—
Village Deep	42	6	22,510	41	3	20,660
Wit. Deep	55	0	16,652	48	9	17,207

Piggs Peak July Results.

The results of operations for the month of July, 1912, were as follows:—25 stamps ran 28¼ days, crushing 2,876 tons, which yielded 558·925 ounces. Cyanided 2,887 tons, yielding 461·961 ounces. Concentrates shipped, 5·3 tons, containing 210·060 ounces. Total recovery from all sources, 1,230·946 ounces, valued at £5,229. Working costs, £2,157. Estimated profits, £3,072.

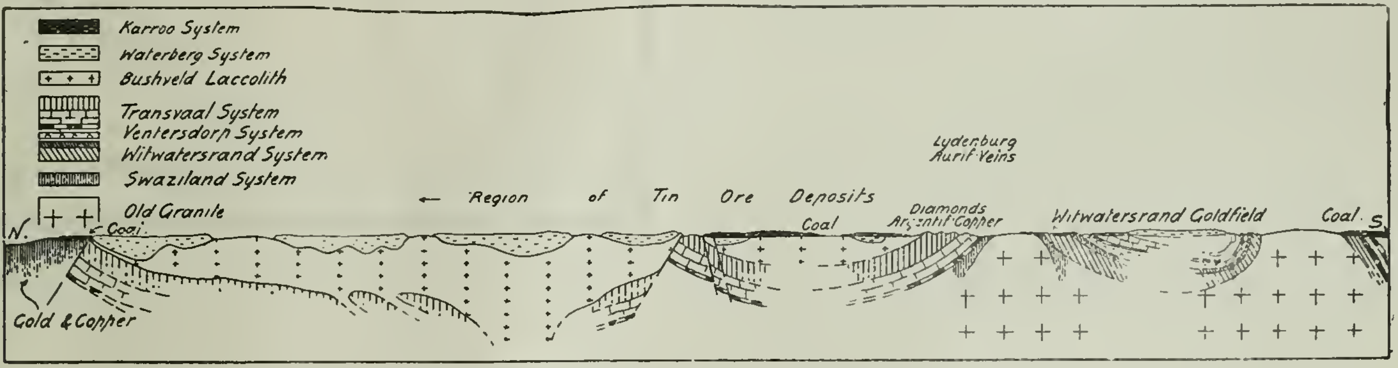
Voorspoed Diamonds.

The following cable has been sent to the Voorspoed Diamond Mining Company's London office:—"Publish the following: Board of Directors of the Voorspoed Diamond Mining Company, Ltd., after consultation with the largest shareholders, has decided to close down the mine on August 3, is now negotiating with a view to a transfer of its assets."

ORE DEPOSITS IN THE TRANSVAAL.

A Series of Highly Mineralised Strata—Coal, Gold, Tin, and Diamonds—Rich Ore Deposits and Favourable Working Conditions.

With the publication of Memoir No. 6 of the Geological Survey, which deals with the geology of the Murchison Range and district, one of the most extensive and interesting ore producing districts in the Transvaal has been discussed in detail for the public benefit. That the memoir will be of great use to the miner and the prospector, in the same way that that devoted to the Pilgrims Rest gold mining district has proved so, and as the admirable memoir relating to the Waterberg tin field should be to those who read it intelligently, goes without saying. The importance and value of the work of the Survey would be amply demonstrated by the evidence of these three publications even if there were not numberless other instructive data scattered through the annual reports and occasional memoirs to justify the modest expenditure incurred in the undertaking. The maps are unquestionably valuable, particularly to those who are competent to make the best use of the information provided by them, and in this connection special reference must be made to the carefully-prepared maps of the Witwatersrand area, which are in process of compilation by Dr. Mellor. Among the more important mineral districts of the Transvaal there still remains to be dealt with the Barberton gold field, the country adjacent to the Swaziland border on the south, and the vast extent of copper producing country towards the Limpopo, in which is situated the now well-known Messina mine. Even then there are other areas of considerable extent to be traversed and described geologically, each of which has some claim to be recognised among the productive and potentially productive areas of the Province in the matter of minerals. There is for example the granite and schist country to the north and north-west of the Waterberg plateau, the diamondiferous country beyond Potchefstroom, and the long stretch of schist formation which runs northwards along the Portuguese border on to the Limpopo, taking in the copper field of M'Tamba, Motale and Messina with their outliers of coal-bearing strata.



Diagrammatic Sketch to Illustrate Geological Relationships and Mineral Distribution in the

It is difficult to place the finger upon any considerable area on a map of the Transvaal without touching some point where one or another mineral deposit of economic value is to be found. A geological chart of the Province, that, for example, of Dr. Hatch in "The Geology of South Africa," will show that the area is divided up between five stratigraphic systems, each of which covers a wide superficial extent of country. The accompanying diagramatic sketch is intended to illustrate the relationships which exist between these various systems, and incidentally to show the distinction and range of the principal mineral deposits which occur in them. The systems are, as will be observed, taking them in descending order, those known as Karroo, Waterberg, Transvaal, and Swaziland, the names being derived, as is usual, from the localities in which these groups of strata are prominently developed. Each comprises a well-marked series of subordinate beds, and is unconformable to the others upon the scale of reference. A section of minor importance is that known as the Ventersdorp system, which includes volcanic lavas and breccias, boulder beds, conglomerates and quartzites, and probably also, the Elsburg series of conglomerates which lie unconformably upon the Upper Witwatersrand beds. At the base of the whole section comes what is commonly known as the "Old Granite," to distinguish it from the newer, or "Red Granite," which constitutes the greater portion of the Bushveld laccolith.

The Leading System.

Taking these systems in order we find at the outset that of the Karroo and here we have the source of that almost illimitable supply of good and cheap fuel, which has made it possible for the Witwatersrand banket to become the centre of the greatest gold producing industry in the world. Speaking of the Middelburg district in his comprehensive paper on "The Coals of the Transvaal," in the *Journal of the Transvaal Institute of Mechanical Engineers* (now the *S.A. Institution of Engineers*), Mr. F. A. D. H. Moseley remarks:—"If the traveller has reached Witbank via Springs he will have left behind him in the order given the Oogies, Tweefontein, Anglo-French and Cassel Landau collieries, and have passed over 25 miles of true coal measures; but if his journey be via Pretoria he will have passed to the southward of the Rogerston, Douglas and Premier Collieries, and over more than nine miles of coal bearing land. When it is borne in mind that at Witbank he has not accomplished more than one-fourth of his nearly due, easterly journey through the Middelburg district, it will readily occur to the reader that the area to be treated of in this section of the 'Coals of the Transvaal' is literally numerous.

"The southern and eastern limits of the coal measures are unknown, but the Middelburg district is bounded on the south by the Bethal and Ermelo districts, and on the east by the Carolina and Lydenburg districts, and that all these districts contain within their boundaries vast deposits of coal is perfectly well known.

"Only an insignificant portion of the total coal-bearing area occurring in the district has, up to the present time, been at all extensively opened up, but amply sufficient, however, to make the name of Middelburg, Transvaal, immediately suggestive of first-class steam coal to all interested in the production of power in any shape or form throughout the length and breadth of the sub-continent."

The areas referred to comprise the greater portion of the coal-bearing country of the Transvaal, but smaller, yet by no means unimportant, patches of coal measures are found in many other places, notably in the Springs, Heidelberg, and Vereeniging districts. The two first-named occurrences being within the limits of the Witwatersrand gold fields, where occasionally, as on the East Rand, the workable coal measures immediately overlie the auriferous bankets, and the last named being at a sufficiently convenient distance to allow of the generation of a large amount of electric power for the needs of the Witwatersrand gold mines. This fortunate contrivance of nature, by means of which the much-needed fuel supply is located just where it is most needed, is not a characteristic feature of Rand geological conditions only. The Barberton gold field is within easy reach of the great coalfield referred to above, while in the rich copper fields of the north, along the southern bank of the Limpopo, a valuable area of coal has been opened up right upon the copper belt of the Motale River. The distribution of the coal resources of the Transvaal to every part of the province by means of railways is being gradually accomplished, and in a few years the chief mineral producing districts will be abundantly supplied at satisfactory rates.

The Waterberg Tin Ores.

Following the Karroo system in descending order comes that of the Waterberg. It is unnecessary to dilate upon the importance of this group of rocks as a depository of minerals of economic value, for the reputation of the few tin ore occurrences which have so far been developed and mined at various points along the great tin belt of the lower Waterberg series and the adjacent rocks has already become world wide. It may truly be said that the tin resources of the province, no less than its coal and gold assets, are practically unbounded. As the conditions under which the cassiterite deposits exist are better understood, so it may be expected that the number of mining ventures inaugurated to work them will become more numerous until the tin production of the Waterberg becomes equal in point of volume to that of any other region in the world. Not only is the ore found along a stretch of considerably over one hundred miles around the main mass of lower Waterberg rocks on the northern side of the Bushveld, in the strata themselves, at the contact with the underlying red granite, and in the upper horizons of the granite, but at various other parts of the country where the vast laccolith is exposed. It is particularly in evidence between Middelburg and Pretoria, to the north of the line of railway, notably in the Bushveld proper, where the first discovery of cassiterite gave rise to so much wild speculation. It is, in fact, likely to be found wherever the red granite is exposed, although not necessarily under payable conditions. The enormous area occupied by this rock in the central Transvaal, as indicated by the great size of the laccolith which is shown in the accompanying diagrammatic sketch, makes it evident that the area of possible discoveries is an immense one.

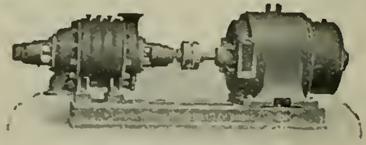
The Bushveld Laccolith.

The reference to the bushveld laccolith in connection with the tin occurrences of the Waterberg system brings us to that marvellous eruptive intrusion which is, after that of the Karroo in the Cape Province, the longest of its kind in the world. The following remarks of Dr. Molengraaff, who was the first, as far as we are aware, to appreciate the economic significance of this vast mass, and to define its approximate limits, are worth quoting:—"The centre of eruptions in the Bushveld cannot be located, but probably the Salt-Pan was one of these centres. The order of the eruptive phases can only be guessed at. Apparently the activity commenced by the intrusion of a magma rich in soda in the beds of the Cape (Transvaal) system, then more or less horizontal. In this mass, doubtless a laccolite, the basicity increased towards the periphery while at the centre the magma was acid and of granitic character. Later the cap was destroyed, and the beds sank on all sides into the magma. These beds were then bent, folded, broken, etc., and dykes formed in the cracks. Then eruptive and volcanic bursts ensued, and doubtless the Bushveld amygdaloids were formed. The limit of the plutonic area is unknown. It covers probably 60,000 square kilometres of which perhaps only a fiftieth have been explored. What results may await further enquiry!"

As explained by Dr. Mellor in reports of the Geological Survey, the outburst took place after the deposition of the lower Waterberg series and before that of the upper Waterberg beds. The magma, having penetrated the rocks of the Transvaal system, spread itself out below the Waterberg beds in the form of a great laccolith, engulphing large masses of them. Portions of the intrusion thrust themselves into the strata of the Transvaal system, the whole of which has, moreover, been modified to a great extent by contact metamorphism resulting from this eruption or associated outbursts. Subsequently to the formation of the laccolith volcanic action occurred on a large scale, and gave rise to the felsites and other volcanic material which forms so large portion of the lower Waterberg section." During the cooling and contraction of the upper portion of the granite mass, movements of subsidence and adjustment took place in the superincumbent strata, which not only gave the area its basin-like structure, but were inevitably accompanied by the production of numerous cracks, fissures and dislocations, both in the upper layers of the granite as well as in the overlying felsites and shales of the lower Waterberg. The relief of pressure consequent upon the formation of these fissures would at once facilitate the liberation and ascent from the underlying magma of pent-up gases and solutions, which on eventually meeting with favourable conditions of temperature and pressure nearer the surface, would act as mineralising agents on the enclosing rocks." Following the volcanic and ore-forming periods referred to came the deposition of the remaining portion of the system, although the existence of granite intrusions into this upper section make it evident that the activity of the great laccolith had not even then entirely subsided.

The Transvaal System.

The Transvaal system, comprising also the Pretoria series of quartzites and shales, the succeeding dolomitic limestone, and the underlying Black Reef series, contributes,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outside the Witwatersrand, the chief gold-producing formation of the Province. In the Black Reef series gold was worked with some success for several years before the war, not many miles from Johannesburg, and occasional attempts are still being made to exploit the same line of country at a profit. On the north dipping section, between the Rand and Pretoria, gold also occurs in the series, but little has, so far, been done to deal with it upon an adequate scale. The chief distinction of the system, as a gold producer, lies in the extensive operations which have been carried on with success for some years past in the Lydenburg district, where a number of interbedded quartz reefs, carrying gold, are found and worked at various horizons in the Black Reef, Dolomite and lowermost section of the Pretoria series. The productivity of the Lydenburg district, as a source of gold, has only begun, to judge from the statements of many of those who are well acquainted with the country, and large areas of practically virgin country are still unprospected. Galena is found in the dolomites to the south-west of Pretoria, and copper ores in the same neighbourhood and elsewhere, especially at Chunie's Poort and along the northern edge of the Marico syncline, where there are old copper workings. South of Zeerust some important deposits of zinc ore are being worked, and lead has, till some months ago, been mined on a considerable scale.

The Pretoria series of the Transvaal system is also mineralised to a notable extent. There are, for instance, the zone of the Willows Silver Mine, Boschkop argentiferous copper lode, and the Transvaal Silver Mine, all of which yielded a fair amount of ore when under exploitation years ago. There again come the lead occurrences in the Upper Magaliesberg quartzites, of which that of Edendale is a typical example. In the same geological horizon is the Cobalt zone of Balmoral and Kruis River. In the vicinity of the overlying basic selvage of the laccolith occur chromite and copper ores, while not far above in the basic margin itself copper ores are abundant, and the Albert Silver Mine, on the red granite, lies at no great distance from the edge in the same line of country. None of these occurrences, which usually comprise quite a variety of ores, have had much attention paid to them during recent years, but it is not improbable that interest may at some time or another be revived in the deposits, and useful and valuable discoveries may be made. The chief distinction of the Pretoria series lies in the fact that therein occur the interesting group of Kimberlite pipes and fissures, east of Pretoria, of which the Premier Mine, the largest diamond mine in the world, is the most prominent. It is not supposed that the progress of discovery has exhausted itself in this direction, and prospecting and mining on a considerable scale is being carried out on the lesser pipes. Below the Transvaal System in the geological succession, the next important system is that of the Witwatersrand, of which it is unnecessary to say more than that from a comparatively small portion of it is produced more than a third of the world's gold output. That portion lies along the northern edge of the so called Witwatersrand basin, the main structural character of which is broadly indicated in the accompanying diagrammatic sketch.

THE LYDENBURG SYSTEM.

Further down are the schists of the Swaziland system and older metamorphic series adjacent to the granite in which occur the famed gold reefs of Barberton, in the south-east of the Transvaal, the Murchison Range and the Letaba, and the rich copper zones of the Messina and other properties in the country to the north, towards and along the Limpopo. This system has yet been but meagrely explored and worked over the greater portion of its exposed area, but such work as has been done gives indications of great promise for future industrial activity.

There remains only the " old granite " to be mentioned, but its exposures are few and of small extent. The only mineral occurrences of importance are the tin ores in the Swaziland border, which have been neglected in favour of the more valuable deposits in the Bushveld, and some gold reefs in the Lydenburg district, which are said to be profitable, and are actually being developed by the Transvaal Consolidated Lands with gratifying results.

Thus, it will be seen, there is no portion of the geological structure of the Transvaal which is not mineralised to some extent, and occasionally to a notable degree. There is probably no region in the world of the same size which has so great a variety or so rich a group of ores and minerals of economic worth, especially under such favourable conditions for discovery and exploitation.

RAND PROGRESS REFLECTED IN OFFICIAL STATISTICS.

Interesting Features of the June Output—How the Industry has Progressed in Twelve Months.

THE monthly analysis sheet of gold production issued by the Chamber of Mines for the month of June contains, as usual, many features of interest which are not noted in the particulars of output as at first published. To deal first of all with tonnages, there were hoisted and taken from the surface dump by Witwatersrand mines 2,374,855 tons of which 2,110,657 tons were milled, the percentage of waste sorted out thus being 12·66 per cent. Companies rejecting the highest amounts were:—Ginsberg, 32·96 per cent.; Geldenhuis Deep, 19·62 per cent.; New Goch, 23·82 per cent.; Spes Bona, 23·33 per cent.; New Rietfontein, 22·80 per cent.; Vogelstruis Estate, 22·40 per cent. The yield per ton was at the rate of 28s. 5d. Highest grades were:—Robinson, 44s. 6d.; New Modderfontein, 40s. 10d.; Village Main, 39s. 3d.; Ferreira Deep, 38s. 11d.; City and Suburban, 37s. 9d.; City Deep, 36s. 9d.; and the lowest as under:—Glencairn, 15s. 9d.; Knights Deep, 16s. 10d.; Roodepoort U.M.R., 17s. 0d.; Simmer Deep, 17s. 3d.: In the outside districts the highest yields were:—Transvaal G.M. Estates, 55s. 7d.; Sheba, 48s. 9d.; Glynn's Lydenburg, 45s. 7d. The lowest recovery per ton was at the Barrett, only 1·3 dwts. In the outlying districts 48,065 tons were milled, and the highest waste rejection recorded is that of the Sub-Nigel—29·56 per cent. On the Rand 9,515 stamps and 249 tube mills were at work, and the average duty per stamp head per day was 8·33 tons. The highest duties recorded were as follows:—Roodepoort U.M.R., 20·03 tons per diem; City Deep, 14·55 tons per diem; Modderfontein B, 14·19 tons per diem; Jupiter, 13·17 tons per diem; Simmer Deep, 12·92 tons per diem; Brakpan Mines, 12·55 tons per diem; West Rand Consolidated, 11·86 tons per diem. In the outside districts the highest duties were:—Nigel, 6·14 tons; and Transvaal G.M. Estates, 6·43 tons. Working costs on the Rand averaged 18s. 6d. per ton, and in the outlying districts 24s. 5d. per ton. The lowest expenses recorded by Main Reef mines were:—Simmer and Jack, 10s. 11d.; Knights Deep, 11s. 3d.; Glencairn Main Reef, 14s. 1d.; New Primrose, 14s. 8d.; Witwatersrand, 14s. 2d.; Simmer East, 14s. 10d.; May Consolidated, 15s. 9d.; Robinson, 15s. 10d.; Simmer Deep, 15s. 10d. The highest costs were those of the Jumpers-cum-Treasury (35s. 8d. per ton), where, of course, conditions are quite abnormal. The average profit per ton was 10s. 1d. for the Rand and 17s. 0d. for outside districts. Contrasting the Transvaal returns for June, 1912, with those for the same month of last year, we find that 37 more stamps and 48 additional tube mills were at work, the " duty " being ·42 tons per day higher. The tonnage milled was 124,000 tons greater and the recovery per ton higher by 11d. Working costs are 8d. per ton higher, but the profit has advanced by 5d. per ton, or £110,331 in the aggregate.

RELIEF UNDER THE MINERS' PHTHISIS ACT.

Details of Financial Benefits Conferred on Sufferers by the Act—Index and Summary.

We have received from the Central News Agency a copy of "The Miners' Phthisis Act" pamphlet, containing index and summary by Dr. Manfred Nathan, together with regulations under the Act, also lists of medical officers qualified to examine and advise under the same Act. In his summary of the Act of 1912, Dr. Nathan points out, *inter alia*, that the Board may make an award to any miner who makes a claim and satisfies the board that he has contracted miners' phthisis and that he has been employed on any listed mine for periods amounting to two of the four years immediately preceding the claim, though this period may be less in case of a miner who has contracted miners' phthisis on a listed mine (Section 16). The board has power to examine witnesses and hear evidence (Section 17). Awards may be set aside or varied on the ground of fraud or error (Section 18). It may review awards (Section 19). Its awards are final and conclusive, and not subject to review by or appeal to a Court of Law (Section 20). The scale of benefits awarded by the board is fixed by Section 21. In the case of miners showing definite signs of the disease, the award may be £8 per month for not more than one year. In case of contraction of the disease to a marked degree, so as seriously and permanently to impair capacity for underground work, £8 per month, but not more than £400 in all. In case of death whilst a beneficiary or during investigation of claim, monthly payments to dependants, but not exceeding the difference between what the miner has already received and £400. In case of death from miners' phthisis where the miner has not lodged a claim, payment to dependants of not less than £8 monthly and not more than £400 in all. Lump sums may be awarded not exceeding the difference between £96 or £400 (as the case may be) and sums already paid. Beneficiaries may be granted a passage outside the Union for themselves and dependants, and may on arrival at destination be paid the balance remaining after deduction of the cost of passage. The Board may also pay medical and burial expenses up to £20. Benefits cannot be paid to miners who have on entering employment wilfully or falsely endorsed on any certificate that they are free from the disease (Section 21). Persons other than miners or native labourers employed on underground work may elect to have deductions made from their earnings and come under the Act (Section 22). Section 23 regulates the mode in which claims are to be presented. A claimant must submit himself to medical examination by two medical advisers. These are to certify, and, in the event of disagreement, to call in a third medical adviser. Their certificate is to be conclusive evidence of the miner's condition, and awards are to be made accordingly. Employers must cause applicants for employment to be medically examined, and are not to cause such persons to be employed underground unless they are certified to be of sound physique and free from miners' phthisis or tuberculosis; but this is not to apply to persons holding discharge tickets from listed mines. Employers, on discharging miners, must furnish them with discharge tickets in the form in Schedule II. of the Act (Section 25). Underground workers' certificates must be endorsed so as to show that the holder has been a beneficiary under this Act or the Act of 1911, or is suffering from tuberculosis (Section 27). The Minister publishes a list of qualified medical advisers, whose fees are payable according to regulation (Section 28). A miner's claim may be continued by his executor on behalf of the dependants (Section 29). Native labourers who contract miners' phthisis are also entitled to compensation. If a native labourer shows signs of the disease, and his capacity for underground work is not seriously or permanently impaired, he is entitled to not less than £1 and not more than £20; if he has contracted the disease to a marked degree, and his capacity is seriously and permanently impaired, he is entitled to not less than £30 and not more than £50. There must be a medical certificate as to the disease. The compensation is payable by the employer to the Director of Native Labour. If a native dies of the disease, his wife, child, or other dependant is entitled to £10 (Section 30). Contracting out of the Act is prohibited (Section 31). Contributions under this Act are to be preferent to all other debts of the employer, except wages and debts preferent to wages (Section 32). Benefits under the Act are not to be assignable or executable (Section 33). A general medical examination on any mine may be authorised by the Minister (Section 34). Persons who have received allowances under the Act of 1911 are entitled to allowances under this Act (Section 36). Investigations on the subject of miners' phthisis may be made and a Committee for the Witwatersrand instituted (Section 37).

Rhodesian Section.

LATEST MINING NEWS.

The Gatooma Strike—The Eldorado Mystery—Globe and Phœnix Developments—Salisbury Despondent, Hartley Cheerful—Prospecting in Northern Rhodesia—Susannah Mines—The Chamber's Report.

Sensational reports are to hand regarding the latest strike in the Gatooma district. This is on Mr. Thomas's farm, and is on the other side of the hills that face Sabonabon farm across the railway. One statement has it that the reef assays no less than 15 ozs. per ton over a width of 15 feet. Whilst such statements should, of course, be accepted with the utmost caution until more work has been achieved, we believe that the discovery is of much importance. About 700 claims have already been pegged off by prospectors in the vicinity of the discovery.

* * * *

The recent heavy fall in the price of Eldorado shares has served to direct increased attention to this property, concerning which so many rumours have of late been current. It is difficult to understand what is really happening at the mine. The shares fell away from 41s. 3d. to 33s. 9d. in a few days, and highly reliable information is to the effect that the pay chute has "pinched" greatly. On the other hand, official information is that the mine is "looking all right." It is understood that a cablegram has been despatched to London stating that the position on the property is, if anything, better than at any time recently. It is said that developments on the 9th level are showing much better values than those on the 8th. In the face of these contradictory statements, it is difficult to know what to believe regarding the Eldorado, and it is even more difficult to reconcile the "better position" on the property with the heavy fall in the price of the shares.

* * * *

It is officially announced that the ore reserves at the Globe and Phœnix mine at the end of June totalled 179,427 tons, of the average value of 35·6 dwts. per ton. The gold contents, therefore, amount to 319,380 ozs., value £1,341,396. At the end of March last the respective figures were:—Reserves, 178,582 tons, average value per ton 36·6 dwts., gold contents 326,805 ozs., value £1,372,581. A year ago the figures were: Reserves 179,040 tons, average value per ton 36 dwts., gold contents 322,914 dwts., value £1,356,238. The following are particulars of development work on the Globe and Phœnix for the month of June:—The actual widths of the reefs, and the actual assay values are given, except where the width of the reef is below 30 inches. In these cases, as a minimum width of 30 inches of rock must be removed for stoping, the value is given as the average for the whole 30 inches width; *e.g.*, if a 10-inch reef assayed 36 dwts., the average value over the stoping width of 30 inches would be 12 dwts., and would be so stated: 12th level S. drive South has advanced 13 feet, average width of reef 23 inches, average value over 30 inches 9 dwts. 18th level drive North from No. 2a winze has advanced 75 feet, average width of reef 5 inches, average value over 30 inches 12 dwts. 18th level drive South from No. 2a winze East Portion has advanced 25 feet, average width of reef 12 inches, average value over 30 inches 117 dwts. 18th level No. 2a winze East Portion, North, has advanced 26 feet, average width of reef 22 inches, average value over 30 inches 99 dwts. 18th level No. 2 winze North, East Portion, has advanced 27 feet, average width of reef 9 inches, average value over 30 inches 1 dwt. 18th level South, drive from 2a winze, East Portion, hanging wall leader, has advanced 54 feet, average width of reef 5 inches, average value over 30 inches 25 dwts. 19th level, drive North Footwall or West Reef, has advanced 51 feet, average width of reef 5 inches, average value over 30 inches 5 dwts. 19th level drive North from No. 1a winze, East Portion, drive North from two cross-cuts West, prospecting advanced 31 feet, average width of reef 19 inches, average value over 30 inches 2 dwts. Cross-cutting for month, 123 feet.

* * * *

In Salisbury there is practically nothing doing at present, and nearly everyone complains of hard times. In the Hartley district things appear to be much better, and the new strike in the vicinity of Gatooma should further improve matters. Mr. J. Mack's good fortune over his purchase of the White Rose property has been the talk of the locality. The purchase price of the mine, it will be remembered, was something between £500 and £600, and in the first month after the deal was concluded Mr. Mack realised over £1,500 from the rubble. But this is not all; there still remains a quantity of "stuff" on the surface, from which it is estimated that at least another £1,000 will be won. At Gatooma a very promising new strike has been discovered, which is said to be phenomenally valuable. It comprises a quartz reef, and carries high values. The length of strike opened up is about 300 feet, and the width of the reef varies from 4 feet to 15 feet. What the actual values are is known only to the discoverers, who prefer to await the result of further development before making any definite statement. A large number of claims, however, have been pegged in the vicinity of the original discovery, which has been limited to nine blocks. The Cheshire Cat is also reported to be opening up well, and arrangements for the erection of a five-stamp mill are being pushed on with as little delay as possible. Crushing at the Try Again and the Tea mines will be started early next month. At the Masterpiece mine there has been a good deal of activity since Mr. McAdams returned, and it is said that efforts are being made to increase the output, which latterly has not been very satisfactory.

* * * *

Prospectors are busy on both sides of the Rhodesia-Katanga border, especially on the British side. The Kasempa district seems to be the chief centre of attraction on British territory, and Cavallo in the Belgian sphere of influence. Gold claims were pegged out five or six years ago not very far from Kasempa, and now that the new mining law has come into force in Northern Rhodesia the original discoverers are taking renewed interest in them.

* * * *

The following are details of recent developments at the Susanna Mines:—No. 8 level winze on south chute advanced 6 feet, reef 12 inches wide, pans 2 ozs. gold. No. 9 level rise in south drive advanced 3 feet, footwall reef 6 feet wide, pans 15 dwts., hanging wall reef 18 inches wide, pans 25 dwts. Drive west at end of north drive footwall reef 30 inches wide, pans 1 oz., hanging wall reef 30 inches wide carries 1 to 2 ozs. in the pan. Drive east at end of north drive reef 15 inches wide and pans 1 to 2 ozs. Winze sunk 4 feet at end of drive, reef 20 inches wide, pans an ounce. Driving started in the reef at 625 feet level, reef is 60 inches wide, no values in pan. Water sufficient.

* * * *

In their report for June the Executive Committee of the Rhodesia Chamber of Mines (Incorporated) state:—*Native Labour.*—The following is a summary of the returns of native labourers employed on Southern Rhodesian mines at the end of the months of April and May, 1912:—

	April.	May.
Local	15,835	15,964
Portuguese territory	7,203	6,957
N.W. Rhodesia	3,949	3,807
N.E. Rhodesia	5,048	5,072
Nyasaland	4,765	5,366
Other sources	945	1,060
	37,745	38,226

The number of natives employed in May shows a decrease of 4,102 when compared with the corresponding month of 1911. The distribution during the months of March and April was as follows:—

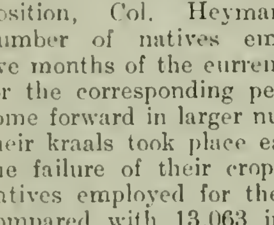
	March.	April.
Producing gold mines ...	21,551	23,342
Non-producing gold mines ...	12,908	13,279
Coal and other mines	1,157	1,124
	35,616	37,745

* * * *

The quarterly meeting of the Rhodesian Chamber of Mines was held in the Library Buildings last week, Colonel Heyman, M.L.C., presiding. The chairman reported that the financial position of the Chamber appeared at the moment to be satisfactory, though there was little, if any, margin on current revenue with which to meet contingencies. As to the native labour position, Col. Heyman remarked that the average number of natives employed on mines for the first five months of the current year was 35,786—3,000 less than for the corresponding period of 1911. Local natives have come forward in larger numbers, or rather their exodus from their kraals took place earlier this year than last, owing to the failure of their crops. The average number of such natives employed for the first five months was 13,748, as compared with 13,063 in 1911. Yet the actual number employed at the end of May this year was 1,700 less than in 1911, showing that the labour offering has distributed itself more evenly. Some anxiety was felt for a time as to the position of the Bureau in the event of the recruits coming down from the North under its auspices not being absorbed, but it is believed that the difficulties in this connection will soon disappear, if they have not already done so. The local natives will probably return to their kraals at an earlier date than usual in view of the necessity imposed upon them to grow an extra allowance of grain this coming season to make up for time lost last season. Meantime it is pleasant to reflect that the first year's difficulties of the new Bureau, apart from those inevitably associated with re-organising a huge business, have been, not in getting natives both for mines and farms, but in placing those they have been able to get. It is a matter of congratulation to all concerned, and a good augury for the future. Speaking of new legislation, Colonel Heyman made special reference to the action of the elected Members in pressing for legislation compelling the De Beers Company to carry out the terms of their agreement and work the diamondiferous deposits of the country. He said: "The principle of 'work or quit' was some years ago forced upon the gold mining industry here, so there is ample precedent for applying it to diamonds."

* * * *

The chairman then made some important remarks on the fiscal policy. He said: "Amongst the important questions which in the near future must engage the attention of this Chamber, as well as that of the community generally, is the fiscal policy which Rhodesia is to adopt. As most people are now aware, a Commission of Enquiry into the trade and commerce of the Union of South Africa has recently presented a report advocating an advanced policy of protection. The Union can, of course, do as it likes in these matters, but it does not necessarily follow that Rhodesia must needs shoulder additional burdens. The effect of the highly protective tariff advocated will be largely to increase the cost of living to the inland consumers, and will thus detrimentally affect the interests of the mining community, in that working costs will immediately increase. Rhodesia is at present a member of the Customs Union, and it is desirable from many points of view that it should remain so, if suitable terms can be arranged. It is quite clear that Rhodesia cannot accept the scale of taxation advocated, and it will have to be seriously considered whether some scheme cannot be evolved by which she may be relieved of some of the burden which the Southern Colonies seem prepared to undertake." Of mineral output, he said: "The returns of gold and other metal and mineral outputs for the six months covered by the report make a cheerful showing. One had expected that, in view of the extreme shortage of labour during the latter part of last year, and the comparative failure of the rainy season in all parts of the country, there would have been a considerable falling off in the production; as a matter of fact, there was an increase of 7,768 ozs., valued at £31,552 in the gold yield for the first six months of this year, as compared with the same period last year. In other metals and minerals an increased value of £16,733 is shown—the total value of the gold and mineral production thus being £1,435,493, made up as follows:—Gold, £1,322,514; silver, £9,658; lead, £4,370; chrome iron, £64,588; coal, £34,263; tungsten ore, £100; total, £1,435,493. This is a total increase for the six months of £48,285. Development activity in most of the districts shows no signs of abatement, while the tributor and small worker, for whom a splendid field is open in this country, continue their good work. Amongst the larger mines, the preparations to erect machinery and commence working for a profit have in many cases reached an advanced stage, and there is every reason to look forward to an increased monthly tonnage in the next twelve months."



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MINING CONCESSIONS IN ZAMBESIA.

What Holders Have to Pay—The Dues, Imports, etc., of the Zambesia Company—Rents, Duties, etc., Payable—Obligations of the Concessionaire.

Letters having frequently been addressed to us of late respecting the nature of the mining concessions granted in the Zambesia area, their acquirement and tenure, the taxation and imposts to which they are subject, etc., we give the following authorised and official English translation, from the *Mozambique Gazette*, of the regulations of the Zambesia Company as the primary concessionaire in this matter, including the dues on the transfer of mining rights, and that company's table of taxes and dues in respect of the working of mining properties.

Leading General Regulations.

In the first place, it is better that the following information of a general character respecting mining in the area referred to should be given:—

A.—A mining claim is undefined as to depth, vertical planes passing through the perimiter constituting the boundary. The area of a claim is: (a) For precious stones, 10 metres square; (b) for precious metals, excepting alluvial gold deposits worked by dredging, 100 metres square; (c) for alluvial deposits worked by dredging, a rectangle of 100 hectares, no side to be less than 250 metres; (d) for other minerals, a rectangle of 100 hectares, minimum breadth, when possible, not less than 600 metres.

B.—Gold, coal and iron concessions are not subject to any royalty to the Portuguese Government. All other metals, etc., pay annually to the Portuguese Government a royalty in addition to payments due to the Zambesia Company, such royalty not to exceed 1½ per cent. of the value of the metals extracted and brought to the mouth of the mine. The payment to the Government of the annual charge of 100 reis per hectare of demarcation is made by the Zambesia Company.

C.—All mineral products are free of export duty. Mining machinery, dredges, and utensils used in mining and metallurgical work are free of import duty, but a guarantee must be given that such imports are solely for the purpose stated.

D.—For accurate interpretation of the Mining Law and Regulations reference must be made to the original Portuguese version.

E.—The privilege of prospecting for and exploiting coal and mineral oils is vested in the Companhia Hulheira da Zambezia. To this company application for sub-concessions may be made.

The Zambesia Company's Rights.—The Companhia da Zambesia holds from the Portuguese Government sole mining rights in the districts of Tete and Zambesia, west of the Licungo River. Prospecting licences are obtained and registration of claims made at the company's mining office at Tete, the head-quarters of the Director of Mines. Mining concessions are obtained from the Portuguese Government, through the Mining Office, and are subject to terms imposed by the Company as follows:—

Imposts and Rents.—Article I.—Every sub-concessionaire holding claims shall pay to the Zambesia Company, in gold currency, the following (£1 sterliog, equalling 4,500 reis, and 1 hectare, equalling 2.4 acres). (1) On receipt of his title deed: (a) For each claim for precious metals of the area of 100 metres x 100 metres, or for each claim of precious stones of the area of 10 metres x 10 metres a fee of 1,000 reis. (b) For each alluvial gold dredging claim of 100 hectares when located on the Zambesi River below Caroabassa, or on the Luenha, Mazoe and Luia Rivers a fee of 50,000 reis. (c) For each alluvial gold dredging claim of the area of 100 hectares when located on any other rivers or ground fit for dredging, a fee of 10,000 reis. (d) For each claim of any other mineral substance of the area of 100 hectares, a fee of 27,000 reis. (2) The following annual rents: (a) For each claim of precious metals of the area of 100 metres x 100 metres: For the 1st, 2nd, 3rd and 4th years 2,250 reis. For the 5th and 6th years 4,500 reis. For the 7th and every following year 9,000 reis. (b) For each alluvial gold-dredging claim of the area of 100 hectares when located on the Zambesi River below Caroabassa, or on the Luenha, Mazoe and Luia Rivers 200,000. (c) For each alluvial gold dredging claim of the area of 100 hectares when located on any other river or ground, 50,000 reis. (d) For each claim of precious stones of the area of 10 metres x 10 metres: For the 1st year, 1,500 reis. For the 2nd and every following year, 2,250 reis. (e) For each claim of any other mineral substance, of the area of 100 hectares: For the 1st, 2nd and 3rd years, 27,000 reis. For the 4th and every followoing year, 90,000 reis. Should the total amount of rent and participation in profits accruing from deposits of precious stones not amount to 75,000 reis per claim per annum, the rent per claim may in such case be raised by the Zambesia Company to this amount. In case, however, it should be proved that the claims are not being exploited so as to secure the benefit of the wealth contained in the deposit, this rent may be further increased to an amount to be fixed by the Zambesia Company.

When Rents are Due.—Article II.—No rents are chargeable in respect of the six months immediately following the date of the title deed. The first rent shall fall due and be payable at the end of such period of six months, and shall be assessed in proportion to the number of months that may therefore elapse up to the 31st December following. Subsequent rents must be paid within the first fortnight of the January of the year in which they fall due.

The Capital Tax.—Article III.—All companies or societies howsoever constituted, acquiring within the territories of the Zambesia Company's concessions any mining property, whether as direct concessionaires, or by any other means whatever, shall, in addition to the liabilities imposed by Article I., pay to the Zambesia Compnay 6 per cent. of their nominal capital in fully paid-up shares of whatever class, or if the company's capital is not divided into shares, a proportionate interest in the company. This liability shall be payable at the time of acquiring the property, and shall extend to any increase of capital, and any issue of debentures that may from time to time be made by such companies or societies.

MANICALAND GOLD: HALF-YEAR'S OUTPUT.

The reef gold output during the half year ending June 30, 1912, was as follows:—

Name of Property.	No. of Stamps.	Tons of Ore Crushed.	CRUSHING. Gold Extracted. Ozs.	Dwts.	Grs.	Average per Ton. Ozs.	Dwts.	Grs.	VALUE.		
Bragança	20	794	311	9	10	0	7	20	£1,308	3	0
Chesterford	2	40	13	1	0	0	6	13	54	15	8
Chimezi-Rhodes Banket	6	653	197	5	15	0	6	1	828	10	4
Crocodile	3	36	7	16	9	0	4	8	32	16	9
Guy Fawkes	7	3,719	515	7	0	0	2	19	2,164	6	10
South Firenza	—	206*	53	9	19	0	5	5	224	12	1
Therése	3	68	81	9	5	1	3	23	342	1	4
	41	5,516	1,179	18	10				£4,955	6	0
		Cyanide Tons Treated.									
Guy Fawkes		1,360	62	9	9	0	0	22	£262	6	7
			1,242	7	19				£5,217	12	7

* Crushed at Chesterford Battery.

REVIEW.

South African Geology. By Professor E. H. L. Schwarz, Rhodes University College, Grahamstown. Blackie & Son, Limited, 50, Old Bailey, London; Glasgow and Bombay.

In a brief introduction to his newly published work on "South African Geology," Mr. E. H. L. Schwarz, Professor of Geology at the Rhodes University College, Grahamstown, late Geologist to the Geological Commission of the Cape Colony, and author of "Causal Geology," remarks, *inter alia*: "A volume of this sort has long been wanted, and it has not been written before because it was necessary that the writer should have a first-hand knowledge of South African geology, and also experience of the difficulties that beset the South African student in interpreting geological nomenclature." That Professor Schwarz has all the qualifications necessary for such an undertaking as he describes is probably a matter of common knowledge, and it is hardly necessary to say that he has acquitted himself of his task in an admirable and satisfactory manner. He gives an illustration of the sort of difficulty that besets the student who is unaccustomed to geological nomenclature in the laughter that greeted him upon one occasion when he ventured to tell his class that desert springs have no "brooks." "It took him a long time," he says, "to see the point; but once seen, I sat down and proceeded to write the present volume. Brooks are unknown in South Africa. . . . The only 'brooks' that the South African student knows of are the Dutch equivalent for trousers." It is merely another instance of the fact that great things often rise from small beginnings, but it will probably occur to most people that the kind of book Professor Schwarz should have sat down to write, if he took the humour of his class seriously, was one upon the advantages of using a pure strain of English or Dutch, as the case may be, and not the bastard variety of language that is being fostered by the bi-lingual faction in the country.

There were two troublesome requirements to be considered when the author began to prepare his book; one was the necessity of keeping it within reasonably small limits, and the other was the question of orthodoxy. The first has been satisfactorily met, for the work is of convenient size, concise, yet comprehensive withal, and the essential facts of geology in general, and South African geology in particular, are all dealt with in a way which cannot fail to attract the attention of the earnest student. Anyone who has read Professor Schwarz's views on the planetismal hypothesis and the origin of plutonic rocks, to refer to two points only in regard to which his opinions do not conform to the teaching of the ordinary text book, will readily admit that the author of "Causal Geology" must have found it quite impossible to be what is called "orthodox." Referring to these subjects in his introduction, he says:—"As this (the Planetismal Hypothesis) is accepted all over America, and is taught in at least two universities in England, I could not, in justice to the science, insert the old exploded nebular hypothesis, with its mediæval visions of fire and brimstone. Brun's work on volcanoes is still in the expensive French edition, and is unknown to most geologists, yet his work is too thorough to permit of doubt but that the steaming-volcano people are wrong. In the case of the igneous rocks I have allowed myself to dilate on the description of sedimentary rocks in defiance of *ex cathedra* statements that basic selvages to laccolites are due to magmatic differentiation; but here I have such unmistakeable proofs that my reading is correct that it would be misleading to instruct the South African student otherwise, when by looking out of the railway carriage he can see for himself the facts of the case." It is much to be regretted that the limits assigned to Professor Schwarz's little book did not allow him to dilate at length upon this extremely interesting—one would like to say all-absorbing—topic, but the little he does write about it, although not so definite and emphatic as it might be, is sufficient to incite the reader to further inquiry, and that is a great deal to have done.

In the chapters on stratigraphical geology, also, there is much that will not meet with universal approval, no doubt. For example, the fact of the repeated occurrence of similar conglomerates throughout the thickness of the Witwatersrand beds "suggests that the Witwatersrand bankets are one and the same series folded upon themselves." The attempted correlation of the Waterberg sandstone with the Table Mountain sandstone is thus disposed of: "The reasons why the Waterberg sandstone cannot be the same as the Table Mountain sandstone, apart from their totally different texture and colour, are that as the Dwyka Conglomerate rests unconformably on the eroded surface of the highly compacted, partially metamorphosed Waterberg sandstone, there must have been a vast time interval between the deposition of the two sediments. In the south the Dwyka Conglomerate is separated from the Table Mountain sandstone by the Bokkeveld and Witteberg, which represent in Europe the whole of the Devonian and Carboniferous times. This, however, is not sufficient time to account for the Dwyka Conglomerate resting on the Waterberg on the north, for the Waterberg would have had to be deeply buried for the compacting and metamorphism to go on. It would have had to be subjected to mountain-building forces, to be wrinkled up into the folds it now exhibits; the overlying strata would have had to be removed, and only then could the glaciers have flowed over the floor of altered Waterberg sandstone, and carried boulders down into the till. As a matter of fact, similar boulders of Waterberg sandstone are found in the Table Mountain sandstone in Table Mountain."

The illustrations in the book, taken almost entirely from South African conditions and sources, are a valuable addition to it. Not only as an elementary text-book, but as a rich mine of South African geological data, the volume is confidently recommended to those who are attracted by studies of the phenomena of the earth's crust. Its special worth for class instruction lies in the fact that it compels interest, and arouses the desire to become more fully acquainted with the matters so concisely and lucidly explained.

East Rand Proprietary Mines.

Last month 820 stamps milled 155,400 tons, and 60,357 ozs. of fine gold were recovered from all sources. The profit was £91,262. Seven months' profits:—January, £67,108; February, £75,609; March, £101,362; April, £98,596; May, £95,024; June, £92,256; July, £91,262.

High Mining Salaries

EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings; Box 2061.

Situations Wanted.

To Mine Managers and Mine Captains.

A first-class PLATELAYER seeks situation on the Reef. Good underground discharges. Holder of Blasting Ticket.
Apply J. G. MURRAY,
100, Jeppe Street, Johannesburg.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

State and the Prospector.

To the Editor, *South African Mining Journal.*

Sir,—I am much interested in your "The State and the Prospector," August 3rd. The conditions here are somewhat different, yet *impossible*; so much so that I am throwing up options covering 1,500 claims, and allowing to elapse 1,000 claims held by or controlled by me. These claims are situated on Appingendam, Delagoa and Bellevue. The State or Government is principally to blame.—Yours, etc.,

PAT BOYLE.

Sterkwater P.O., Waterberg Tin Fields,
August 6, 1912.

"Native Labour Recruiting Corporation, Ltd."

To the Editor, *South African Mining Journal.*

Sir,—As one who has had a lot of experience in labour recruiting, a few notes from me anent the above corporation might not be amiss at this stage. Past experience has proved that hurriedly formed labour organizations have not lasted long, principally owing to the fact that the promoters started off without first being clear as to what support they would get from recruiters, and this danger is staring the Native Labour Recruiting Corporation largely in the face. As far as I know, the well-established recruiters, as a whole, throughout the country are, practically speaking, in the dark as to the important conditions they will be asked to accept under the amalgamated organization, and it is up to the mines behind the Native Labour Recruiting Corporation to insist upon the entire programme being submitted at once. Certain groups of mines are at present, and have been for some considerable time, well supplied with native labourers, and the supply has come from the long-established recruiter regularly, and it is this class of man who must be carefully handled by the new organization, otherwise his services will be lost. There is, of course, another class of recruiter, whose name is legion, floating about the country, but he is not to be relied upon either by his employer or the boy he recruits, so he is not worth considering in connection with the question. Naturally, the old-established labour agent knows by this time exactly what it costs him to deliver natives and what he must get from his employer in order to make something, and it will depend a great deal upon what capitation fees are offered whether he will continue to recruit or not. Another point arising out of this is whether the present recruiters will be allowed to recruit for all the mines under the new organization or whether they will be restricted to the groups they are now recruiting for. It goes without saying that a man who has established a good business in a district for his group of mines is not going to allow a man from another group to step in and compete with him and perhaps in a short time not only ruin his business but get the mines a bad name, too. At the present time a well-established recruiter who puts out a good monthly average of boys to the mines, cannot maintain his output unless he gets about 50s. for a six months' contract boy, delivered at the entraining centre, so it will be well for the new organization to consider this point very carefully. In labour recruiting, the labour agent has many losses to put up with, and these have to be taken into consideration in estimating what capitation fee he must get to come out on the right side. In former years, recruiters had very little difficulty in collecting boys, as they came out in batches, but nowadays it is downright hard work, and the boys are hunted up singly. Of course, if the new organization adopts a fair tariff with recruiters, and profits from the experience gained by a man like Mr. Taberer, then there is no reason to suppose that matters might not right themselves in time. One cannot hide the fact that certain groups paid too much for their boys, and whilst I know the reason for their doing so, I do not feel disposed to tell it. When further particulars regarding the new organization are forthcoming I might have something further to say, and in the meantime will subscribe myself—Yours, etc.,

"RECRUITER."

Hendryx Agitator: Results of M.T.C. Trials.

To the Editor, *South African Mining Journal.*

Sir,—If the article re the above in the issue of 27th July, 1912, is not to be taken as a manufacturer's advertisement but as an independent technical report, objections must be raised against the suppression of important facts, in the light of which the "official figures" must be considered.

In the manner these figures are published they are misleading, and cannot be compared with present day practice without taking the following points into account:—

1.—In the Hendrix Tests the Cyanide has been added in the form of salt giving a fresh and comparatively pure solution of greater efficiency than that by using the contaminated stock solution.

2.—The consumption of Cyanide refers exclusively to the operation of agitation only and does not include the loss of Cyanide sustained in the extractor boxes and that going with the moisture to the dump.

3.—In the Hendrix tests the pulp has been heated. The well-known beneficial effect of heat is not an intrinsic merit nor an exclusive particularity of the Hendrix Agitator.

4.—The percentages of extraction are calculated from the values of *washed* samples and the total extraction cannot therefore be directly compared with the extraction values published in Mine records, which usually refer to unwashed residues as they are sent to the dump.

5.—The statement that "as much or more of the gold and silver can be dissolved in one hour by the use of the Hendrix Agitator as can be dissolved in twenty-four hours by the usual methods of percolation" is not only misleading, but directly incorrect if the quantities dealt with are taken into account. In the Hendrix 18 feet Agitator only about 35 tons Sand and Slime mixed are agitated during 7

ROBESON-DAVIDSON PATENT CENTRIFUGAL PUMPS

For Pumping Sands and Slimes.

Minimum Maintenance Costs, Highest Efficiency, Unrivalled Accessibility to all parts and Flexibility in raising tailings to any height.

The Pump that Supplanted the Tailings Wheel.

Further particulars from the Licensees:—
FRASER & CHALMERS, LTD., Johannesburg.
TARRY & COMPANY, LTD., Johannesburg.
ROWE & JEWELL, Johannesburg.
WRIGHT, BOAG & CO., Johannesburg.

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hours, whilst in common practice up to 400 tons of sand are treated in 5 to 7 days. To put the comparison on a fair and equal basis another day or two would have to be added to the 7 hours treatment of the 35 tons of the Hendrix Agitator, the time required for the transfer of the sands, settling, washing, re-settling, and emptying of the treatment vat, which operations are all included in the 5 to 7 days sand treatment in usual practice. (For circulating or agitating *slime* 4 to 5 hours, also in usual practice, are considered sufficient.)

6.—In order to arrive at definite conclusions as to the economical merits of the Hendrix Agitator more information should be given with regard to costs of heating, power consumption, etc. We should also be told the degree of moisture to which the settled mixed sand and slime can be reduced " by gravity filtration " within a reasonable time, and how the dewatered product is to be handled for dumping.

It is to be regretted that the M.T.C. cannot see its way to publish its own official reports on such important trials of general interest involving considerable expenditure. In general, a greater publicity of the data in possession of that body would be highly appreciated by the engineering profession. Even the results of scientific research work are withheld from them. When Mr. Alfred James, in the reply to the Chairman's welcome at a meeting of the Ch. M. & M. Society suggested that the M.T.C. should undertake systematical research work so as to obtain more definite data connected with tube-milling he was not aware—nor could he be aware—that much work in this direction had already been done by the writer whose services were retained by the M.T.C. exclusively for this purpose during the past 3 years. Referring to the same line are the trials carried out at the Knights Deep-Simmer East Battery for establishing the economic limit of crushing between stamps and tubemills, and the fine-grinding trials executed by Mr. F. L. Bosqui at the Geldenhuis Deep, Ltd., where 20 stamps and one tubemill were cut off as a separate circuit for this purpose. With the kind co-operation of the Government exhaustive breaking tests involving an enormous amount of work have been carried out at the Government Mechanical Testing Laboratory, which report also is pigeon-holed in the Secretary's office.

This secrecy in scientific research work is not helpful to progress, and if the Mining Houses contributing to the expenses of the M.T.C. expect to obtain value for their money the experiences and knowledge gained must be open for the benefit of all and not to the privileged few who happen to be in that Committee at the time of a trial.

Inventors, in submitting innovations and new processes to the M.T.C. have to abide by the result of the latter's test, and should not be afraid of the publication of official statements, which to a certain extent would prevent the commercial abuse of " official figures " in the way illustrated in the following little story:—

A wine merchant sent to a distinguished customer a reminder of an account which had already been paid. As this was not the first time such an error had occurred, His Excellency, a jovial gentleman, complained angrily: " Your wines are excellent, but your book-keeping is fearfully disorganised and rotten." On receipt of this letter the merchant promptly issued a circular announcing in big type: " His Excellency, Mr. ———, writes us to-day: ' Your wines are excellent.' "

H. STADLER.

Johannesburg, August, 1912.
P.O. Box 4240.

Geological Truth Tablets.

To the Editor, *South African Mining Journal.*

Sir,—We have four auriferous geological ages in South Africa, viz., the Schistose Lydenburg, Witwatersrand and Black Reef age. None of the above ages are less than five miles thick. There is no Black Reef series in the Lydenburg age. Lydenburg dolomites and Black Reef dolomites differ as chalk from cheese. The so-called Pretoria series is not Gats Rand series—vide Nature's book, page 5,000,000. The Molyneux, Hex River, West Bonanza and Blue Sky series are identical. Blue Sky series is in the hills opposite the Henry Nourse G.M. Co. The Government Reef series is more than a mile away from Main Reef series, and therefore a very poor guide to it. If the Geldenhuis Mill stands on the Government Reef series, then, according to Nature, Du Preez and the Van Ryn series must be south of it. Randfontein series is Black Reef series, and contains thirty pebble beds—five payable. Main Reef series, to the west of the Rand, traverses Witpoortje, Vlakfontein, Reitvlei, Lower Luipaardsvlei, etc. Black Reef age can cover the Witwatersrand age, as the coal measure covers it, in many places. There are no shales in the Kimberley series. Bird Reef series has its shales—or better, slates. Main Reef series ends up on shales, some 400 yards from " the " Main Reef. There are seven reefs, underlying Main Reef, of which the Coronation is one; vide Knights. Main Reef has quartzites foot and hanging. A shale footwall to Main Reef was invented by certain geologists to fit an exploded theory. Main Reef series to the Man-in-the-street comprises Main Reef, Main Reef Leader and South Reef only. " The " Reef has no meaning to the intelligent, as there are thousands of reefs in this country. Quite a number of reefs have shale footwalls—notably, Blue Sky, Van Ryn, Du Preez, North Reef, Government Reef, and Black Reef, of the Black Reef series. There are at least thirty shale beds underlying Main Reef series, and no two are alike. No two series are alike in their quartzites, or pebbles either. Van Ryn series is not Modder " B," and Modder " B " is not Nigel. Nigel series is not Main Reef series, any more than Van Ryn and Kleinfontein are Main Reef series. Van Ryn series and Du Preez series underlie Main Reef series. They have shales above and shales below, and shales wheresoever they go. There are many more miles of Main Reef series in the outside districts than here on the Rand. Buffelsdoorn is the only bit of Main Reef series being mined outside the Rand, and geologists will still lay twenty to one that it is not. Colour-geology will assist the learner more than all the books and papers of the orthodox school. Stratigraphy is an exact branch of geology, and admits of no theories.—I am etc.,

SCOTT ALEXANDER.

[Mr. Scott Alexander's " tablets " are of a kind that should be kept out of the reach of inexperienced persons. We regret that we have no time to make a detailed analysis of all of them, but cannot refrain from saying that we are quite unable to assimilate the last ones until we are informed what particular brand of " stratigraphy " is referred to.—Ed. " S.A.M.J."]

The Year's Work of the Crown Mines Benefit Society.

The annual meeting of the Crown Mines Benefit Society was held in the Crown Mines main hall the other evening. The statement of accounts for the twelve months ended June 30, 1912, showed that the Society had expended £10,018 3s. 5d., and received £10,241 16s. 8d., leaving a surplus of £226 13s. 3d., equal to 2.21 per cent. of the revenue. The subscription for the year averaged 8s. 4d. per member per month, and is accounted for as follows: Medical attendance, 2s. 8¾d.; medicines, 11¾d.; hospital and ambulance, 1s. 10½d.; funeral expenses, 3½d.; sick pay, 1s. 9¾d.; special relief, ½d.; salaries, 4½d.; general charges, ¾d.—8s. 1¾d.; surplus, 2¼d. Members' monthly subscriptions, 8s. 4d. Mr. J. Matheson, the president, in moving the adoption of the committee's report and statement of accounts, referred to the items of expenditure as analysed in the report, which he considered as satisfactory. He pointed out that the clause in the rules whereby a member can retain his membership for a limited period after ceasing to be an employee of the Crown Mines, Ltd., had proved an advantage to members who were sick, or who had sickness in their homes, at that particular time. He considered it both a duty and pleasure to be connected with such a useful institution. Mr. R. Rowe, in seconding, referred to the low cost of administration, which showed slightly over 5 per cent. of expenditure, the remaining 95 per cent. being absorbed in direct benefits to the members. He held that the members appreciated the able manner in which the business of the Society had been conducted by the retiring Committee. Mr. W. S. McQueen, in supporting, expressed his opinion that the financial position of the Society must be kept on a sound basis to provide against epidemics, considering there were approximately 5,000 persons under its care. The report and statement of accounts were unanimously adopted, and the retiring committee were thanked for their services. The new committee, consisting of 25 members, were elected, the meeting closing with a vote of thanks to the president.

Wanted a Partner.

An interest in Five Gold Mining Blocks on Eiffel Flats is offered in return for 100 feet of sinking on reef below water level. Lode is closely correlated, both geologically and mineralogically to well-known Motor, and is situated at head of same vlei.

Apply " PARTNER " c/o this office.

THE JULY OUTPUT: GROUP RETURNS.

Majority of Groups Show Increased Profits—Features of Month's Work Reflected in Figures.

Rand Mines Group.

The following are the results of crushing operations of the subsidiary companies of the Rand Mines, Ltd., group for July:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	66,000	17/11·4	22,433	£34,958
Geldenhuis Deep	300	7	48,700	27/ 9·1	17,513	5,669
Nourse Mines ...	260	7	57,000	20/ 7·2	20,270	26,142
Ferreira Deep ...	235	7	53,390	20/11·8	24,981	48,616
Crown Mines ...	660	26	166,000	17/10	63,525	118,900
Dur. Rood. Deep	100	3	25,470	23/ 3·7	8,754	7,010
Totals & averages	1855	57	416,560	20/1·4	157,476	£241,295

The declared estimated monthly profits for 1912 are:—January, £206,122; February, £209,989; March, £267,731*; April, £224,289; May, £238,284; June, £242,288; July, £241,295.

Gedenhuis Deep.—Reasons for decreased tonnage and reduced profit have already been published.

The following are the results of crushing operations of the Eckstein companies of the Rand Mines, Ltd., for July:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	33,780	17/ 9·1	15,707	£35,931
New Modder ...	180	7	41,500	20/11·0	19,585	38,488
City Deep	110	9	41,600	24/ 3·8	18,116	25,109
Village Deep ...	180	7	52,000	19/ 8·6	16,143	16,385
Village Main Reef	220	6	42,800	17/ 2·8	20,495	48,805
Robinson	250	6	47,700	15/ 5·8	23,173	60,209
Bantjes	85	3	24,383	23/ 3·6	7,934	4,792
Totals & averages	1105	43	283,763	19/ 6·6	121,253	£229,719

The declared estimated monthly profits for 1912 are:—January, £221,326; February, £213,242; March, £373,426;* April, £225,284; May, £243,784; June, £231,590; July, £229,719.

Village Deep.—There was a temporary decrease in grade during the month.

Neumann Group.

The following are particulars of the results achieved by the crushing companies in this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep	38,560	£54,275	£18,180
Wolhuter	29,300	40,848	15,030
Main Reef West	20,850	32,872	11,676
Cons. Main Reef	24,051	34,045	11,030
Knight Central	23,550	28,910	5,563
Jumpers-cum-Treasury ...	—	—	291
		Total for group	£61,770

The Wolhuter has 1,873·227 fine ozs. in reserve.

The monthly profits for 1912 are: January, £44,280; February, £46,072; March, £52,686; April, £55,333; May, £57,213; June, £60,362; July, 61,770.

Barnato Group.

The following are the results of operations for July on the producing mines of the Barnato group:—

COMPANY.	STAMPS.	TONS.	REVENUE.	PROFIT.
Consolidated Langlaagte .	140	20,978	£30,403	£10,300
Ginsberg	80	14,071	21,339	7,216
Gleneairn Main Reef ...	160	20,237	16,231	3,039
New Primrose	160	23,900	36,775	19,339
New Rietfontein	120	16,000	19,818	3,550
New Unified Main Reef	60	11,310	17,096	5,069
Quest	30	3,008	2,753	556
Witwatersrand	220	40,010	45,539	19,242
July totals	970	149,514	£189,954	£68,311
June totals	970	145,995	£190,572	£67,467

The monthly gross profits for 1912 are:—January, £59,227; February, £58,273; March, £61,223; April, £63,336; May, £66,133; June, £67,467; July, £68,311.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of July of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ...	320	7	76,000	20,911	£45,770
Robinson Deep	210	6	47,500	18,652	33,539
Knights Deep	270	6	62,200	12,534	17,505
Simmer East	130	3	34,000	7,823	6,997
Simmer Deep	135	8	52,000	11,262	5,716
Jupiter	105	7	41,550	9,841	2,483
Sub-Nigel	30	1	4,610	1,996	1,515
Totals	1200	38	317,860	83,019	£113,525

Reserve Gold.—Simmer and Jack, 1,455 ozs.; Robinson Deep, 3,362 ozs.; Jupiter, 250 ozs.; Sub-Nigel, 750 ozs.; total, 5,817 ozs.

The "total profit" shown above includes sundry revenue, viz.: Simmer and Jack, £1,500; Robinson Deep, £506; Knights Deep, £363; Simmer East, £110; Simmer Deep, £495; Jupiter, £101; Sub-Nigel, £353; total, £3,428.

The declared profits for 1912 are: January, £101,429; February, £111,697; March, £120,190; April, £113,026; May, £117,305; June, £113,230; July, £113,525.

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of July are:—

COMPANY.	STAMPS.	TUBES.	TONS.	VALUE.	PROFIT.
May Consolidated ...	100	—	16,020	£17,787	£6,078
Princess Estate ...	60	5	19,200	26,043	1,497
Lancaster West ...	100	3	20,500	22,428	1,169
Geduld	50	2	14,480	18,763	4,441
	310	10	70,200	£85,021	£13,185

The monthly profits for 1912 are: January, £11,860; February, £12,242; March, £11,231; April, £10,649; May, £14,255; June, £15,017; July, £13,185.

The Albu Group.

The following information regarding the July operations of the producing mines of this group has been forwarded us for publication:—

Company.	Stamps.	Tube Mills.	Tons Crushed.	Total Cost.
Aurora West	80	—	14,539	£14,071
Cinderella Consolidated ...	80	3	17,760	21,774
Meyer and Charlton ...	75	2	14,427	13,519
New Goch	120	4	27,315	22,669
Roodepoort United	55	4	34,171	28,393
Van Ryn	130	6	10,270	30,836
West Rand Consolidated ...	100	4	27,000	31,340
	640	23	175,482	£162,602

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	19/ 4·3	£18,102	£4,032
Cinderella Consolidated ...	24/ 6·2	21,877	104
Meyer and Charlton	18/ 8·9	31,065	17,546
New Goch	16/ 7·2	26,608	3,938
Roodepoort United	16/ 7·4	32,520	4,127
Van Ryn	15/ 3·8	54,255	23,419
West Rand Consolidated ...	23/ 2·6	38,372	7,032
		£222,799	£60,198

The monthly gross profits for 1912 are:—January, £62,797; February, £48,400; March, £61,777; April, £60,494; May, £67,968; June, £63,103; July, £60,198.

Cinderella Consolidated.—Low grade and profit due to air blasts during month, causing temporary suspension of operations in six high grade stopes.

Modder Deep Strike.

The secretary writes:—I am directed to inform you that the Main Reef series was struck in this company's No. 1 shaft on the 2nd instant, at a depth of 2,990 feet, dipping 11 degrees south. The reef series consists of hanging-wall leader, value 21·88 dwts. over 27·9 inches, including partings, followed by 31 inches of waste. The middle reef assays 23·78 dwts. over 6 inches, and is separated by 22·6 inches of waste from the footwall leader, the latter being 39 inches wide, including partings and assaying 7.26 dwts. per ton. The average of the whole body, including waste, is 126·5 inches wide, assaying 8·84 dwts. per ton. The deepening of the shaft and the cutting of the station are in hand and will take about two months to complete.

New Companies.

Central Diamond Syndicate, Ltd., 125, Cullin Buildings, Johannesburg; registered July 3; capital, £20,000.

The Transvaal Cavalry Association, Grand Hotel, Market Street, Pretoria; registered July 5; capital, £20.

The Transvaal Tanning Co., Ltd., 261, Vermeulen Street, Prétoria: registered July 9; capital, £1,000.

Leviathan Tin Development, Ltd., 107, Exploration Buildings, Commissioner Street, Johannesburg; registered July 11; capital, £10,000.

Moore's Ltd., 5, Manners Mansions, Joubert Street, Johannesburg; registered July 12; capital, £2,000.

R. S. Stockvis and Sons (South Africa), Ltd., 296, Market Street, Pretoria; registered July 13; capital, £1,000.

Rand Torch Factory, Ltd., 2a, De Beer Street, Braamfontein, Johannesburg; registered July 16; capital, £3,000.

Norman and Lyche, Ltd., 12, Sydney Buildings, Pretoria; registered July 19; capital, £4,500.

Union Soap Work Co., Ltd., Erf No. 1937, Carl Street, Pretoria West: registered July 19; capital, £3,000.

Blaauwbank Gold Mine, Ltd., Farm Blaauwbank No. 101, Krugersdorp; registered July 20; capital, £1,000.

Georgian Gold Co., Ltd., 13, Winchester House, Johannesburg: registered July 31; capital, £5,000.

Foreign Companies Registered.

Granaatplaats Diamond Prospecting Syndicate, Ltd., care of T. E. Duckles, Consolidated Buildings, Johannesburg: registered July 9; capital, £5,000.

Increases of Capital.

Transvaal Bischoff, Ltd., Johannesburg; registered July 9; capital increased from £30,000 to £32,051 10s.

Engineering Supplies, Ltd., Johannesburg; registered July 9; capital increased from £30,000 to £32,000.

El Oro (Transvaal) Gold, Ltd., Johannesburg; registered July 31; capital increased from £17,000 to £18,250.

In Liquidation.

World's Tours (S.A.), Ltd., Johannesburg: voluntary.
British Bechuanaland Diamonds, Ltd., Johannesburg; voluntary.

Kolmanskop Diamonds.

The output of diamonds from this company's property at Luderitzbucht for the month of July was 9,702 carats.

Tenders Accepted.

The South African Railways have accepted the following tenders for June, 1912: 1. Bandolier Kop-Messina Railway, earthworks, etc.: Contract No. 1 Messrs. Gibello and Corte, £1,010 7s. 6d.; contract No. 2, Messrs. Gibello and Corte, £1,920 15s.; contract No. 3, Messrs. Gibello and Corte, £4,610 3s.; contract No. 4, Mr. R. Monzali, £6,309 16s. Warmbaths (lease of catering premises and bar), Mr. D. J. Ritson, at £200 per annum. Fencing Material: Messrs. Wm. Bain and Co., wire, galvanised drawn steel fencing No. 7 strand, 23½ tons at £12 11s. 3d., £295 4s. 5d. (delivered f.o.b., Glasgow); Messrs. Richard Johnson and Nephew: wire, galvanised drawn steel fencing No. 5 strand: 33 tons at £12 15s., £420 15s. (delivered f.o.b., Liverpool); Messrs. The United States Steel Products Co., wire, galvanised barbed 12½ S.W.G.: 53 tons at £11 1s. 3d., £586 6s. 3d. (delivered ex-ship, Capetown); 36½ tons at £11 1s. 3d., £403 15s. 8d. (delivered ex-ship, Port Elizabeth); 27 tons at £11 6s. 3d., £305 8s. 9d. (delivered ex-ship, East London); Messrs. D. Willets, Ltd.: Eyebolys, 18in. x ⅝in.: 74,058 at £2 per 100, £1,481 3s. 2d. (delivered f.o.b. British ports); Messrs. Wm. Hosken and Co.: Intermediate posts, 7ft. long: 67,200 at £6 0s. 4d. per 100, £4,043 4s.; Mr. Jac. Loopuyt, for Messrs. Denny, Mott and Dickson: Wire, galvanised wrought iron fencing No. 8, S.W.G.: 352 tons at £8 12s., £3,027 4s.; wire, glavanised wrought iron fencing, No. 6, S.W.G.: ½ ton at £8 12s. £4 6s. (delivered f.o.b., Hamburg-Antwerp). Lease of Farm "Sandfontein," Mr. W. Bruorton, at £240 per annum. Bridgework for Extension of Witbank Footbridge: Messrs. Gilbert Hamer and Co., Ltd. (Johannesburg), £180 (f.o.r., Congella wharf). Supply of Oils through the High Commissioner): Linseed oil, 8,000 gallons, 3s. 1¾d to 3s. 5d. per Imperial gallon (f.o.b.); lard oil, 2,480 Imperial gallons at 4s. 3d., £527 (f.o.b.). Mooi River-Escourt Deviation (earthworks and concrete work, Grantleigh Station): Mr. J. Dunn, at £676 10s. Baltic Timber: Hillman Brothers, Johannesburg: Deals, red Swedish, Pietersburg: 9in. x 3in. seconds, 150 standard at £17 14s. 3d., £2,656 17s. 6d. White Mealies: The Vereeniging Co., 3,000 bags at 9s. 10d. per bag, £1,475 (f.o.r., Vereeniging). New Store (Pretoria): Messrs. Braby and Co., Ltd., £3,112 (f.o.b.).

ANSWERS TO CORRESPONDENTS.

"A. E."—Hold.

"Auto."—Enquiring.

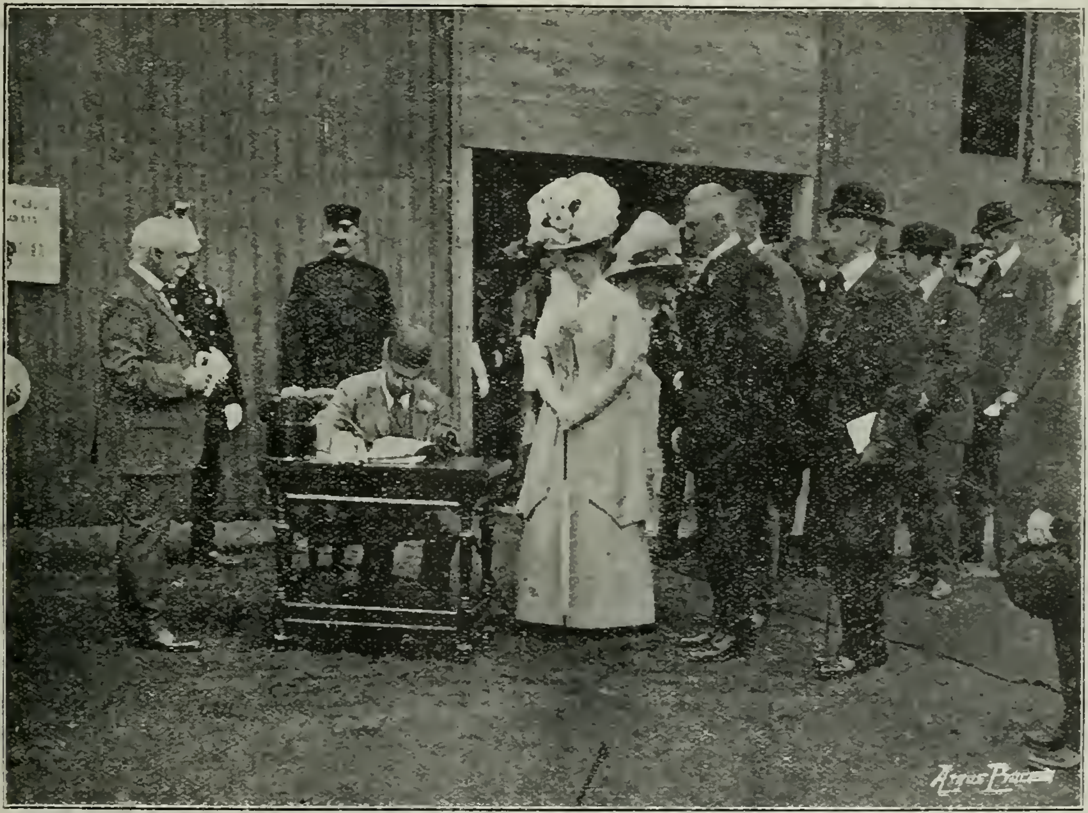
"Anxious" (Durban).—If the quotation is, as you say, 2d. for Midas Deeps in Durban, you had better sell, as the Company has gone into liquidation; there is nothing for the shareholders, and the name has been taken off the Stock Exchange official list.

E. J. MOYNIHAN,
CONSULTING ENGINEER.
PLANS, SPECIFICATIONS, REPORTS AND ADVICE, MINING EQUIPMENT, STRUCTURAL WORK AND FINANCIAL ADVICE.
10, ANGLO-AUSTRIAN BUILDINGS. Box 2061.

THE KING'S VISIT TO A WELL-KNOWN ROPE WORKS.

Conducted Through Cradock's.

On Wednesday, in mail week, the King and Queen, accompanied by their host, Earl Fitzwilliam, Lord Harewood, Lord-Lieutenant of the West Riding, the Marquis of Zetland, and other members of the house party at Wentworth, visited the steel and wire rope works of Messrs. Geo. Cradock & Co., Ltd., Wakefield. Many ladies and gentlemen were gathered on the lawn by the neatly designed pavilion which the firm erected to commemorate the King's Coronation, and in another part of the yard the workmen's wives and children were accommodated with seats from which they could see the Sovereign and Queen Mary enter the works. Whilst awaiting their arrival they were entertained with selections by the band of the 4th King's Own Yorkshire Light Infantry. Mr. George Cradock, of Highfield House, Lound, and Lound Hall, Tuxford, who is well known on the Rand, and Mr. Percy Cradock received their illustrious visitors, and Mrs. George and Mrs. Percy Cradock were presented to the Queen. As the Royal party arrived, Sergt.-Major Linwood, a veteran wearing many decorations, ran up the Royal Standard, and the old man was heard to say that he was more proud of the honour than of all his decorations. Many of the workpeople, who are old soldiers, volunteers, and members of the St. John Ambulance, were wearing their decorations, whilst others wore the Royal colours. Mr. George and Mr. Percy Cradock conducted their Majesties through the works, explaining the various processes as they moved from one department to another. They saw a 15-ton steel furnace tapped, the ingot hammered into the billet, and the billet rolled into rods. His Majesty was very much interested in the different processes, especially in the rod-rolling, and asked many pertinent questions. They saw the rods drawn into wire and the wire made into ropes. The secretary of the company, Mr. Bates; the works manager, Mr. Knox; and the engineer, Mr. Spencer, were presented to the King. Before their Majesties left the works they inscribed their names in the visitors' book and expressed their thanks to the members of the firm. The King graciously accepted as a souvenir a sample of lock coil winding rope. It is a sample of the rope being made for the Maltby Main Colliery. The rope is silver plated, and is mounted with a canopy and crown, and forms a paper weight. As his Majesty passed through the works he was shown the club-house, erected to commemorate the Coronation of King Edward, and the bowling green and club-house for the staff established to commemorate his own Coronation. His Majesty told Mr. Spencer that he had noticed what a respectable, healthy, happy, and contented lot of men the employees appeared to be. After their Majesties had left the works the men ceased work for the day, and they and their wives and children were provided with refreshments, and in the evening there was a concert and other amusements. Mr. George Cradock's farm hands and stablemen, together with their wives, from Highfield and Lound Hall, were present to see the King and Queen, and were entertained at the works. Congratulations are being showered upon the Rand branch of the firm and its popular manager, Mr. Tony Lommel, on the unique honour paid to the parent works by their Majesties.



His Majesty the King inscribing his Name in the Visitors' Book at Cradock's.

THE WEEK IN THE SHAREMARKET.

Firmer with Increased Activity—Improved Outlook—Demand for Modder Deeps and Modder B's.

The market has shown a firm tendency this week, coupled with much higher prices for several stocks, notably Modder Deeps and Modder B's. The excellent assays from the former and the improvement at the latter mine are, of course, responsible for the rise in their prices. Mines in the vicinity have, naturally, all benefited by the good news, and, should development in the Modder Deep continue as it has begun—and there is reason to believe it will—prospects for the whole far East Rand will be the better for it. Outside these special "lines," however, there has been little increase of activity, though the tone throughout the whole market it better. The Turkish trouble is, naturally, regarded with suspicion, as it may lead to international complications, but, against this, the fact that Paris is buying is taken as reassuring. The next week ought to show whether the improvement is to become general or not.

	* Friday, 2nd.	* Sat., 3rd.	* Monday, 5th.	* Tuesday, 6th.	Wed., 7th.	Thurs. 8th
African Farms ...	15 9	16 0	...	15 9B	15 9	15 6B
African-European In.	11 0S	...	...	...	...	11 0S
Adair-Usher Process	1 0B	1 0B	...	1 0S	..	1 6S
Apex Mines ...	28 0B	24 0	...	...	...	27 6B
Bantjes Consolidated	20 6B	20 6S	...	20 6B	...	20 6B
Benonis	4 9	4 9B	..	5 0	4 10B	4 9S
Bushveld Tins ...	...	...	...	...	1 3S	...
Brakpan Mines ...	76 0B	75 6	...	75 6B	77 6S	76 0B
British S A. ...	26 6B	26 6B	...	24 6B	26 9B	...
Cinderella Cons. ...	..	22 6S	...	..	22 0B	..
City and Suburban ...	47 6B	47 6	...	47 9S	47 6B	47 0B
City Deeps	58 0B	58 3B	...	58 3B	57 6B	53 6B
Cloverfield Mines ...	5 4	5 11B	...	6 0	6 0B	6 0
Cons. Langlaagtes ...	24 3	24 9	.	24 9	24 9	24 6
Cons. Main Reefs ...	19 6	19 6S	...	19 9	19 9	19 9
Coronation Freeholds	0 5B	0 6	...	...	0 6B	...
Clydesdales	9 6B	...	...	...	...	...
Concrete Cons. ...	...	...	...	...	7 0	...
Cons. Mine Selections	11 3B	11 0B	...	...	11 0B	...
Con. Investment ...	19 0B	...	...	20 0B	20 0B	...
Crown Mines	...	139 0B	..	139 0B	140 0S	...
East Rand Cent. ...	10 0B	10 6B	...	10 9	11 0B	10 9B
East Rand Coals ...	2 4	2 4B	...	2 3B	2 4B	2 4B
East Rand Deeps ...	...	2 0	...	2 1B	2 2B	2 1
East Rand Props. ..	58 3B	58 0B	...	58 6B	59 6S	57 0B
East Rand Deb. ...	£92	..	...	...	...	£92
Eastern Gold Mines	1 10	1 9B	...	1 9B	1 10B	1 9B
Frank Smith Diam...	8 6B	8 6B	...	9 0	8 9B	...
French Rands ...	...	1 0B	...	...	1 0B	...
Govt. Areas... ...	23 9	24 6	...	24 6B	24 3	24 9
Glynn's Lydenburgs	25 0	24 6B	...	25 0B	25 0B	24 0B
Glencairns	...	4 0B	...	4 0B	4 0B	4 0B
Glencoe (Natal) Colls	6 0B	6 0B	...	6 0B	6 0B	...
Geduld Props. ...	23 6B	23 0B	...	23 3B	23 0B	23 6
Hex Rivers	0 6B	0 6B	...	0 5B	...	...
Jumpers	...	...	...	6 3B	...	...
Jupiters	10 3B	10 3B	...	10 3B	10 9B	10 0B
Kaalfontein Diamonds	0 5B	0 5B	...	0 4B	0 6	0 5B
Klerksdorp Props. ...	3 1B	3 0B	...	3 0B	3 0B	3 0B
Knight Centrals ...	13 6B	13 9B	...	13 9B	13 9B	13 6
Luipaardsvlei Estates	6 9B	7 6B	...	8 9B	8 9B	8 0B
Lace Props.	3 4B	3 4B	...	3 5B	3 6B	3 7
Lydenburg Gold Farms	2 5	2 3B	...	2 0	2 6B	2 6B
Main Reef Wests ...	25 6	25 3	...	25 0B	25 6	25 0B
Modder B's	59 6B	61 0B	...	61 0B	64 3	34 0B
Middelvlei Estates...	1 8B	1 8B	...	1 7B	1 7B	1 7B
Modder Deeps ...	29 6B	30 6	...	31 0B	32 0	35 0
Meyer & Charltons...	87 0B	...	..	...	87 6B	...
New Eras	7 3B	7 3B	...	7 3B	7 6B	7 3B
New Kleinfonteins...	...	27 8S	...	27 6S	26 6B	26 6S
New Rietfonteins ...	8 0	...	...	...	7 9B	...
New Unifieds ...	17 0S	17 0S	...	17 0S	17 0S	...
New Boksburgs ...	1 9	1 6B	...	...	...	...

B Buyers. S Sellers.

	Friday, 2nd	Sat., 3rd	Monday, 5th.	Tuesday, 6th.	Wed., 7th.	Thurs. 8th.
Orange Diamonds ..	1 4B	1 5B	...	1 6	1 6B	...
Pigg's Peaks ...	..	12 0B	...	12 0B	12 0S	12 0B
Pretoria Cement Co.	50 0B	50 0B	...	51 0B	50 0B	52 0
Pretoria Estates ...	...	17 6S	...	...	17 6S	...
Paardekraal Estates	0 6B	1 0S	...	1 0S	0 6B	...
Potchefstroom Est....	1 0B	1 0B	..	1 0B	...	1 0B
Princess	9 9	9 9B	...	9 6B	9 9B	10 0
Rand Nucleus ...	3 2	3 0B	...	3 0B	2 10B	3 0B
Randfontein Estates	26 3B	26 6B	...	27 0B	26 9	26 0B
Randfontein Deeps...	4 0B	4 3B	...	4 3B	4 3B	4 6B
Rooiberg Minerals ..	30 6B	29 9B	...	30 0	30 0B	29 6
Rand Klips	4 8	4 9B	...	4 11B	4 11B	5 0
Ryan Nigels ...	3 9B	3 9B	...	3 9B	...	...
Roberts Victors ...	14 0B	13 6B	...	15 0B	15 0B	15 0B
Simmer Deeps ...	2 6B	2 9S	...	3 0S	2 9B	2 6B
South African Lands	4 1B	4 1	...	4 0B	4 2	4 2B
S. Randfontein Deeps	3 3B	3 3B	...	3 3B	3 4B	3 3B
Sub Nigels	5 0B	5 0B	...	5 0B	5 0B	5 3B
Springs Mines ...	15 3B	15 6B	...	...	15 6B	16 0B
S. A. Breweries ...	40 0S	38 6B	...	40 0S	39 9B	38 6B
Trans. G.M. Estates	45 6B	46 9B	...	46 0B	47 6	47 6
Temple Tins	4 0S	4 0B	...	4 1B	4 3B	4 1B
Trans. Coal Trusts...	45 0B	45 6B	...	45 0B	45 0	44 9B
Tudors	1 3	1 3B	...	1 3B	1 3B	2 0S
Van Ryn Deeps ...	17 0B	17 6B	...	17 9	18 0	18 0B
Village Deeps ...	...	39 6B	...	40 6S	...	38 6B
Vogel. Cons. Deeps...	...	1 0S	...	1 0S	1 0B	1 0B
Voorspoed Diamonds	10 0B	10 0B	...	10 0B	10 0B	10 6B
Van Dyks	...	2 3B	...	2 6S	...	2 6S
Witwatersrands ...	53 0B	53 0B	...	53 0B	53 0B	53 0B
Wolhuters	21 0	21 6B	...	21 6B	21 6B	21 0B
Witbank Collieries...	44 0B	44 0B	...	44 0B	46 0S	44 0B
Wit. Deeps	18 6B	48 3B	..	...	48 0B	..
West Rand Est. ...	2 7B	2 9B	...	...	2 6B	...
West Rand Con. ...	11 0B	11 0B	...	11 9B	12 0B	11 6B
Zasiplaats	36 0B	36 3B	...	37 0	36 6	38 6

B Buyers. B Sellers.

INVESTORS' DIARY.

The following company meetings have been announced:—

Aug. 30.—Treasury Gold Mines; Wit. Deep; Crown Mines.
Sept. 4.—New Kleinfontein; Anglo-French Land Co.
Sept. 21.—Wit. Deep.
Sept. 23.—Crown Mines.
Sept. 27.—Sub-Nigel; Simmer and Jack Prop.; New Kleinfontein; Wolhuter, G.M.
Oct. 19.—Wolhuter G.M.
Oct. 29.—Jumpers G.M. Co.
Oct. 30.—Rooiberg Minerals.
Nov. 6.—New Modderfontein.
Nov. 27.—New Boksburg G.M.; Rand Klip.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

Mr. J. M. Calderwood, M.I.M.M., leaves for England on Monday on a brief business visit.

Electrical Notes.

A YEAR OF ELECTRICAL ACCIDENTS.—II.

ELECTRICAL ACCIDENTS IN FACTORIES OTHER THAN ELECTRICAL STATIONS IN 1911.

The Chief Inspector of Electricity has the following in his annual report :—The small figures relate to fatal accidents, and are included in the principal figures : Arcing of switches, 37 ; arcing of fuses, 10 ; shock or burns from fuses when replacing fuse-wires, 28 ; portable apparatus, connectors and flexible wires, 62^{2} ; unprotected conductors, switches, terminals, fuses, etc., 23 ; working on or near live conductors, skilled persons, 41 ; working on or near live conductors, unskilled persons, 24 ; miscellaneous accidents in electrical manufacturing works, mostly in testing operations, 36^{1} ; adjusting brushes and cleaning commutators, 2 ; miscellaneous, 27^{4} ; total, 290^{7}. These accidents show a slight increase in number over those of the previous year—290, as against 176—whilst the fatalities were seven, as compared with five in the previous year. Of those caused by the arcing of switches, a number on motor circuits were as usual primarily due to the previous failure of the no-voltage release on the starting switch, so that the main motor switch was put in on a short circuit, producing a heavy arc at the contacts. In some cases the switches were protected by covers having a slot for the handle to work through. This form of cover is the only one which can be applied to certain types of switch, and while it is satisfactory in preventing the operator from touching live metal, it does not protect the hand from being burned if a heavy arc occurs within the cover, unless there is in addition a shield on the handle. Accidents from the arcing of fuses are due to absence of adequate protection. Some enclosed or cartridge type fuses which will operate satisfactorily on a moderate overload will explode violently on a short-circuit, and need protection as much as bare wire fuses. Many of the accidents in the renewing of fuses were with the primitive type of bare wire or strip-metal fuses directly connected to the live fuse terminals, and unprotected by a switch. Short-circuits were made with screw-drivers or by the fuse metal getting across both poles. In some cases switches were provided for cutting off the pressure, but were not used. In one case the man took hold of a live fuse terminal, 220 volts alternating, and was unable to leave go until pulled away by someone else. The 62 accidents in connection with portable apparatus were mostly due to short-circuits, causing burns. In 24 cases the short-circuits were in the flexible wires and were due to the covering of the wires having been damaged, or to the fact that the wires were insufficiently protected in the first instance in view of the rough treatment to which they would be subjected in ordinary use. In 21 cases the short-circuit occurred at the connector plug, and under circumstances where the accidents would have been prevented by the use of plugs constructed with hand shields on the lines which I have described in former reports. Several were caused through connecting hand lamps and even drills, taking a considerable amount of current, by means of "adapters" to ordinary lampholders. There are also several cases of shock received from portable drills which were leaky and had not been earthed. The two fatalities occurred through the use of unearthed and improperly constructed hand lamps. The accidents to skilled men, i.e., "electricians," when working on live conductors are frequently inexcusable, the men taking unnecessary risks of which they are fully aware. In some cases they have not taken the trouble to switch off the pressure, and in other cases the work might have waited until after factory hours, when the whole installation, or, at any rate, the particular circuit could have been made dead without inconvenience. The similar accidents to unskilled men, *i.e.*, not having technical knowledege, were in several cases due to the stupidity of, or want of proper supervision on the part of, the electrician in charge of the work. In some cases the men attempted to do some work entirely on their own responsibility, and in others they were employed on work for which they were not technically competent. The accidents occurring at the works of electrical manufacturing firms were nearly all in the testing departments, and, as usual, many occurred to apprentices and the like. The average age of 32 of the 36 persons meeting with the accidents was only 21 years. The fatal case occurred in a large testing shop, and was due to a mistake in connecting up two high-pressure machines with the same set of conductors and artificial load, one set of men apparently not being aware of what the others were doing. One machine was started up, and a man working on the other received a fatal shock.

Electricity Supply in Durban.

Preparations have been in hand for some time at the Durban Corporation Electric Power Station for the supply of electric power in bulk to the Government of the Union of South Africa for the railway and harbour requirements in Durban and district, and on Sunday, June 2nd, the change-over was satisfactorily effected. This means the shutting down of the Government power station, which is only a few years old. The building now becomes one of the sub-stations at which point the bulk of the supply is taken from three Corporation mains at 6,600 volts three-phase 50 periods. The cables were supplied by Messrs. Callender's Co., and are of three-core .1 sq. in., paper-insulated with copper earth shield, which, after laying and joining, were tested to 10,000 volts. At the sub-station there are five Reyrolle standard three-phase switch panels, for controlling the various incoming and outgoing cables; the outgoing cables are two in number and they were laid by the Government at the time the plant was put in; these also are .1 sq. in. three-core, and are for supplying power for the Point and Buff. At the Point section, current is taken at 6,600 volts three-phase and also 500 volts D.C., the conversion from three-phase to D.C. being effected by the previously installed 300-K.W La Cour converters, now taken over by the Corporation. At the Bluff section, current is taken at 6,600 volts three-phase into the Government sub-station as before, but in this case the Government do the converting. Under the agreement between the Corporation and the Government, the former takes over certain of the plant, for which payment will be made to the extent of about £26,000, while the Corporation itself has entailed an expenditure of about £50,000 for the extension of plant to meet this bulk supply, and also for future requirements in Durban and district. Among manufacturers and other users of machinery, the plant taken over by the Corporation from the Government is as follows :—Two 750-kw. Willans-Parsons turbines, with three-phase 6,600 volts 50 periods Bruce-Peebles generators; two surface condensing plants and circulating pumps; two 300-kw. La Cour converters; and cables between works and Bluff. The new plant installed by the Corporation is as follows : —Two 2,000-kw. Parsons turbos three-phase 6,600 volts 50 periods; one barometric condenser (Mirrless-Watson); two B. and W. boilers. 28,000 lb. evaporation, with chain-grate stokers; extension of cooling tower and pumping plant; three-phase switch panels. The agreement is for 15 years, and the very low price of ¾d. per unit has been fixed upon with a minimum of 2¼ million units per annum, and it may be of interest to mention that this price is far away the lowest rate for bulk supply in South Africa, as will be seen by comparison with the other Government bulk supplies, as follows :—Durban, .75d. per unit, 2¼ million units minimum; Pietermaritzburg, 1.25d. per unit, 750,000 units minimum; Capetown, 1.5d. per unit, 1¼ million units minimum; Port Elizabeth, 2d. per unit, 150,000 units per minimum; East London, 3d. per unit, 125,000 units minimum. The average day load by the Government is about 1,200-kw., and at night 300-kw. This will very materially help to flatten out the peak and tend to more economical running, and now that the Corporation are in a position to meet practically all demands for power, it is expected that other consumers will follow on; in fact, already one brick company is taking three-phase current for two 300-h-p. motors at a distance of five miles from the centre of the town. It might be of interest to mention that this new load will bring the output of units sold from the Corporation power station to nearly twelve million units per annum, and the next municipal year should see this figure reached if not exceeded. Considering that the population of the town is about 34,000 whites and the same number coloured, the average consumption per head of population far exceeds that which obtains in most English towns. Touching briefly on the financial side of the undertaking, considering the output the capital expenditure of £350,000 cannot be considered excessive. The cost of production is also a creditable figure for a Colonial town where wages and coal are high, being .9d. per unit sold, excluding capital charges.

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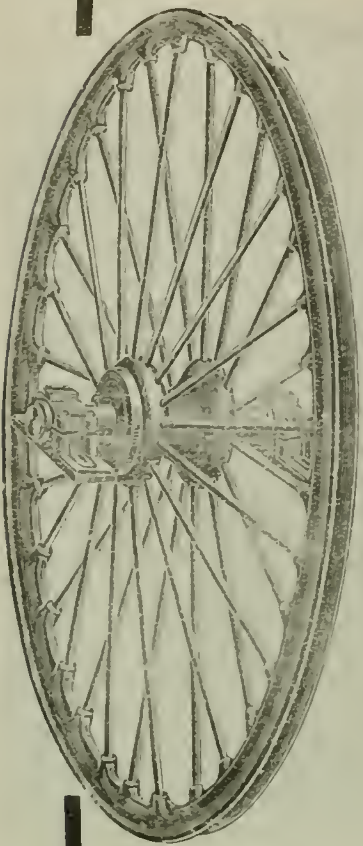

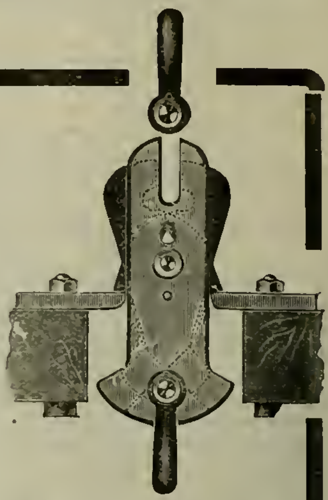

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Engineering Notes and News

S.A. Institution of Engineers Launches Out.

KIMBERLEY THE FIRST BRANCH.

In Johannesburg the South African Institution of Engineers has taken under its wing all the subsidiary cognate bodies, and the parent institution has made Kimberley its objective for the establishment of the first branch. To that end the institution despatched Messrs. E. Goffe, D. Cullen, and A. S. T. Tregaskis (members of council), R. G. Campbell Pitt (hon. treasurer), and A. C. Whittome (secretary), to Kimberley for the purpose of forming the first branch. The Johannesburg members recognised the important part that Kimberley has taken in engineering and other work which comes within the scope of the Institution of Engineers, and called a meeting of professional men last week in Constance Hall for the purposes named. Mr. J. A. Vaughan presided, and besides the visitors from Johannesburg already named, there were also present Messrs. J. Harbittle, J. Liddell, G. Hauff, H. G. Ording, F. Harrison, W. Harrison, S. G. Talman, A. E. H. Dinham Peren, R. D. McLeish, James Stewart, G. M. Robertson, A. B. Young, J. Taylor, R. A. Newberry, C. J. Farquhar, T. Callen (Borough Engineer), T. E. Padern More, H. T. Dickinson, R. W. Herr Smith, H. Simpson, and A. W. Jones.

The Chairman, after reading the circular convening the meeting, said it gave him great pleasure to be present. The deputation from Johannesburg were supported by all the members of the Rand. He referred to the experiences in Kimberley of their president, Mr. J. A. Yule, who regretted that, in the year of his presidency, he was unable to visit Kimberley to advocate the movement now being introduced. Mr. Vaughan and Mr. J. A. Campbell Pitt made interesting speeches, after which, on the proposition of Mr. Liddell, Mr. J. Harbottle was appointed provisional chairman. Mr. Harbottle having taken the chair, thanked them for the honour, and congratulated those present on the formation of the branch. The draft regulations submitted by the parent institution were read and adopted. Messrs. J. Liddell, G. Hauff, F. Harrison, and H. Simpson were elected members of the provisional committee, the chairman to be an ex-officio member. Mr. A. B. Young was elected as hon. secretary. The chairman intimated that the provisional committee would submit suggestions regarding the area to be embraced by the Kimberley branch. Continuing, he said that this concluded the business of the meeting. He wished to thank the Johannesburg members for visiting Kimberley, and he hoped they would go away with pleasurable memories of their visit. A vote of thanks to the chair terminated a very successful meeting.

Sale of Gas: The Cape Draft Ordinance.

The Cape Local Authorities' Gas Ordinance, which has been introduced into the Provincial Council by the Administrator, provides that: (1) No gasworks shall be established within the area of any local authority without the consent of the Administrator and the local authority. (2) No gas shall be supplied within any such area from gasworks situated outside without the consent of the Administrator and the local authority. (3) No gas shall be supplied within the area of a local authority, whether generated within or without its area, except in accordance with this Ordinance and the regulations for the time being in force thereunder: provided that, as regards any existing supply, the consents required by this section shall be deemed to have been obtained, but the supply shall otherwise be in accordance with the provisions of this Ordinance and the regulations for the time being in force thereunder. The quality of the gas supplied shall be (with respect to its illuminating power at a distance as near as may be of 1,000 yards from the works of the undertaker) such as to produce a light equal in intensity to 12 sperm candles. The gas for such testing shall be consumed at the rate of 5 cubic feet per hour in the Metropolitan Argand Burner No. 2, as described by the London gas referees, and the standard of light shall be the Harcourt 10-candle Pentane lamp. Such was shall (with respect to its purity) be so far free from ammonia and sulphuretted hydrogen that it shall not discolour either turmeric paper or paper imbued with acetate or carbonate of lead when exposed to a current of gas issuing for three minutes under a pressure of five-tenths of an inch of water; provided that the company and the local authority shall be at liberty to agree upon any other mode of testing the purity of the gas, and thereupon, the undertaker shall be liable to have the purity of the gas tested in the manner agreed upon. The calorific power of gas supplied shall be 420 British thermal units "net" per cubic foot. The gas supplied by an undertaker shall be at such pressure as will at all times balance a column of water not less than one inch in height. The only legal standard or unit of measure for the supply of gas by measure shall be by the cubic foot containing 62.321 pounds avoirdupois weight of distilled water weighed in air at a temperature of sixty degrees (Fahrenheit) and with the barometer at thirty inches.

A large circle of friends on the Rand will hear with deepest regret of the passing of Mr. Thomas Begbie at Middelburg last week. Mr. Begbie was a well-known figure in the life of Johannesburg in pre-war days, and the explosion which occurred in the iron foundry belonging to Messrs. Begbie shortly after the outbreak of hostilities will be readily recalled.

Electric Current for Domestic Purposes.

The Tramway and Lighting Committee of the Johannesburg Municipality reports as follows: In pursuance of the policy adopted twelve months ago with regard to encouraging the Council's consumers to utilise electricity for domestic purposes, the General Manager has from time to time, as occasion has presented itself, seized the opportunity of bringing to the notice of the public the many advantages accruing from its use. With this object in view, it is proposed to have a booklet printed to be distributed to all consumers. This booklet will set out the numerous electrical appliances for domestic purposes and their general utility, and will also contain information as to the cost of the average amount of current used by such apparatus, and as a result we hope that more consumers will be encouraged to adopt electricity for general purposes, and will bring about the building up of the Council's day-load. The general manager has gone into the matter very carefully, and tentative prices have been obtained as to the cost of compiling such a booklet. We have ascertained that the cost of the publication of 10,000 copies of a 36-page booklet, complete with half-tone block reproductions, which blocks will become the property of the Council, and statistical matter, bound in boards, and delivered free at the Council's stores, will be approximately £140. From the electrical contractors' advertising space in this booklet it is estimated that a sum of £80 will be derived, so that the cost to the Council, provided this space is absorbed, will be approximately £60. The Council will, of course, have to distribute the booklets to consumers. We are of opinion that the interests of the Council will be served by the compilation of a booklet on these lines, and we recommend that tenders be invited for the compilation of a booklet on the lines indicated in the above report, and that an expenditure of £140 be sanctioned for the purpose.

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Finance, Commerce, and Industries.

Commerce and Industries.

An official statement, issued at Pretoria, and published last week, notifies that the Department of Commerce and Industries is henceforward to be merged into that of Customs, and will come under the future control of Mr. Smuts. This is the sorry sequel to the abolition of the Commerce and Industries portfolio in the Union Ministry, held successively by Sir Frederick Moor and Mr. George Leuchars.

* * * *

Domestic Electricity at Durban.

The Durban Municipality have for some time been contemplating a reform in the system of charging for electric current consumption, and we believe that this is very shortly to come to a decision. There is no complaint with the present charges—on the contrary, the Durban consumers are exceptionally well off, not only in comparison with other South African towns, but also in contrast with places generally throughout the world in which electric light services have been laid down. The motive for re-modelling the electricity tariff in Durban is not connected with any question of public dissatisfaction with the amount of the charges, but is in order to supply an incentive to the consumer to utilise his current for a more varied number of uses. The Corporation, by an arrangement with the Government, has recently centralised the whole electricity supply of the borough within its own power station. Where the railway management formerly undertook its own generation, with a separate power-house equipment and distributing system, this is now being performed by the Municipality from the generating station, and this concentration having been brought about, the question is now one of getting the fullest possible use out of the machinery by supplying cheap power for heating and cooking.

* * * *

The Rise in Prices.

Various reasons for the general rise in prices have been advanced. Many people appeared to think, said an authority who has conducted inquiries in Australia, that the large production of gold had been the main factor in raising prices. Professor Irving Fisher held that the increased production of gold and the restoration of credit were the two fundamental causes. In France it had been alleged that crop failures and droughts were the main causes, and among the serious causes alleged were increased cost of production consequent upon fuller occupation of public lands through growth of population, with consequent diminishing returns from agriculture; progressive reduction of natural resources, e.g., reduction of soil fertility; increase of all production of farm products, due to higher prices and higher wages, this last with increased consumption; increased cost of transport of food products; concentration of population in cities; increase in middlemen's charges and in number of middlemen; increased expense from soliciting business by commercial travellers and large advertising; the creation of trusts, combinations, and trade agreements; over-capitalisation; corporate restrictive legislation; increased wages, with shortening of hours of labour; the consequence of cold-storage organisations displacing the neighbourhood farmer; adulteration and debasement of quality in foods; the opposite, namely, improvement in quality of foods, due to various trade laws and sanitary requirements; legislation that affected tariffs, and so on. Some writers alleged that people were getting better living, and naturally had to pay more for it. Others alleged that the main cause was the increase in the world's armaments, and general governmental extravagance; the effects of the South African and Russo-Japanese war; increase in public burdens of old-age pensions; better provisions for insane asylums, hospitals, gaols, and other institutions; assurance against accident and disease; burdens of unemployment and crime. It was curious to notice that in America the farmer accuses the middleman, the middleman the jobber, the jobber the wholesaler, the wholesaler the retailer, the retailer the consumer, the consumer the trusts, the trusts the labour unions, and the labour unions the tariff.

* * * *

East African Improvements.

In the debate on the Supplementary Estimates for Uganda and East Africa, last week, Mr. Lewis Harcourt (Secretary for the Colonies) said that of the half million loan which it was proposed in June should be given to the Colonial Office for developments in East Africa, £300,000 would go to the Uganda Railway, £35,000 to the improvement of the ports on the Victoria Nyanza, and the provision of another cargo steamer, £40,000 for the improvement of the pier at Kilindini, and of the remainder, £25,000 be devoted to railway from Kampala to Fort Bell, which will possibly be the beginning of a trunk line to tap the boundaries of the Congo, and £100,000 to improve communications with the eastern side of Uganda, with a view to the development of cotton growing. He mentioned that the profit on the Uganda Railway for the current year was £135,000. Replying to criticisms, he said that there was a wireless station in course of erection at Nairobi, which would be a great link in the Imperial wireless scheme, and be a step between Aden and Pretoria. The estimate was adopted without a division.

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Developing Angola's Resources.

According to "O Fomento," Lisbon, the Central Government and Col. Friere d'Andrade have recently been engaged in studying means for the practical and speedy development of the great resources of the Province of Angola, whose present economic position is very serious. As a result, the following projects, among others, will be presented to Parliament:—Upon the cultivation of cotton, with a view to its development for the supply of the raw material for the textile industry of Portugal. Upon the cultivation of coffee and rubber, in such a manner as will enhance the value of these products, framing regulations which will ensure the replanting and replacing of the species of the latter which may have been destroyed. Upon the colonisation of the salubrious plateau of Benguella and Mossamedes on practical lines, and in such a way as will ensure a definite result. Upon the prolongation of the Malange Railway in the direction of Tubango so as to serve the region of Lunda, which is very rich in rubber. Finally, upon the Mossamedes Railway, so as to serve the districts of Huilla and Chibia, making its route take a direction which will ensure its junction afterwards with the Otavi Railway, on the German frontier.

* * * *

Building Activity.

Nine Municipalities in the Transvaal Province during the month of June approved plans having an estimated value of £551,280, as against £142,436 for the month of May, showing an increase of £408,844, and nine Municipalities in the Cape Province approved plans having an estimated value of £34,475. The Durban Municipality passed plans having an estimated value of £15,358. Details are to be found in the following statement:—Estimated values of buildings the plans of which have been approved by the undermentioned Municipal Councils during the month of June, 1912:—

Johannesburg	£514,539	0	0
Boksburg	4,620	0	0
Benoni	8,253	0	0
Germiston	2,853	0	0
Krugersdorp	5,875	0	0
Potchefstroom	230	0	0
Pretoria	11,690	0	0
Roodepoort	1,400	0	0
Springs	1,820	0	0
Capetown (May)	1,480	0	0
Woodstock	110	0	0
Wynberg	125	0	0
Simonstown (quarter ended 30th June)	20,800	0	0
Steytlerville	6,000	0	0
Queenstown	1,100	0	0
Fraserburg	1,200	0	0
Oudtshoorn	560	0	0
Van Rhynsdorp	3,100	0	0
Durban	15,358	0	0
Total	£601,113	0	0
Tenders accepted by Government for pubic buildings during the month, and not included in the above amount	£84,732	4	5

* * * *

Six Months' Trade.

The Trade Returns for the Union of South Africa for the month and six months ending June 30th shows that the import trade of the past six months fell slightly short of that for the corresponding period of 1911, but if articles imported for South African Governments be included, the total volume of imports during the first half of the present year exceeded that of last year by a quarter of a million sterling. The total imports and exports in the two periods may be given as follows:—Six months: 1912, Imports £19,081,391, exports £30,455,226; 1911, £18,774,651, exports £27,397,881. It may be remarked that during June there was a considerable decline in the value both of imports and exports, probably a merely temporary phenomenon in the case of exports, but rather disquieting in the case of imports. The importation of articles of food and drink continues to show a decline, the value for the half-year being £2,779,596, as against £2,982,548 in the first half of 1911. The butter importations have fallen in the period named from £119,000 to £72,000, but the most notable decrease has been in respect of corn, grain, and flour, of which we imported to the value of £400,000, as against £614,000 in the corresponding period of last year. South African-made soap seems to be driving the imported article out of the field, the imports for the first half of last year being almost double those of the current year. On the export side of the account the chief increase for the half-year is in respect of gold, the value exported being £18,837,470, as against £16,886,767 in the first six months of the previous year. The diamond export has grown in the same period by £330,000. The other more notable increases may be given in tabular form:—

	Six Months.	
	1912.	1911.
Wool	£2,436,802	£2,048,664
Whale oil	46,906	3,718
Hides and skins	694,824	537,878
Mohair	410,375	323,600
Articles of food and drink ...	311,691	200,421
Maize	139,951	73,931
Ostrich feathers	1,323,091	1,160,585
Coal	604,523	533,079
Bark	157,955	138,335

On the whole, this is a very satisfactory record.

* * * *

Benguella Railway Company.

The accounts of the Zambezia Exploring Company for the fifteen months ended September 30th last show a profit of £26,452, chiefly made up of sums received by way of interest on moneys advanced to companies whose welfare it is to the interest of the Zambezia Exploring Company to promote. The directors are thereby confirmed in their opinion that their policy in this direction has been the right one to pursue. This company holds a large interest in the Benguella Railway Company, which is making satisfactory progress, the receipts showing a steady increase from year to year, and the policy carried out by the board in increasing its interest in that railway appears to be justified.

* * * *

Sena Sugar Factory.

The prospectus is advertised in London of the Sena Sugar Factory, Ltd., a company which was formed in 1910 to take over an undertaking of the same name, the properties including an estate and sugar factory at Sena, on the River Zambesi. Since its formation the company has acquired a second estate and factory on the Zambesi, a one-third interest in a lease of the property in Africa of the Companhia do Assucar de Moçambique, and two refineries in Lisbon and a controlling interest in the Zambesi Navigation Company. Its share capital consists of £410,000, divided into 16,000 Seven per Cent. Cumulative Preference shares of £10 each and 50,000 Ordinary shares of £5 each; and there are also outstanding £80,000 Six per Cent. First Mortgage Debentures and £100,000 in Six and a-Half per Cent. Second Debentures. In order to adjust the capital account, in consequence of recent expenditure, the company now invites subscriptions for the whole of the £160,000 Preference shares at par, though it is stated that £52,370 has already been applied for and allotted in full. The net profits for the last two years, after deduction of Debenture interest, depreciation and other prior charges, are certified to have amounted to £20,600 for 1910 and £91,000 for 1911, so that a good margin is shown over the amount required for the payment of the dividend on the Preference capital. The business is, of course, a speculative one, but, taking into consideration the high rate of interest, the shares seem a satisfactory investment of their class.

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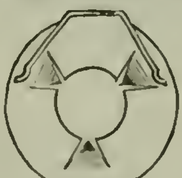

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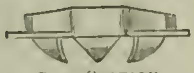

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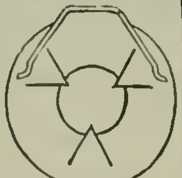

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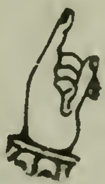

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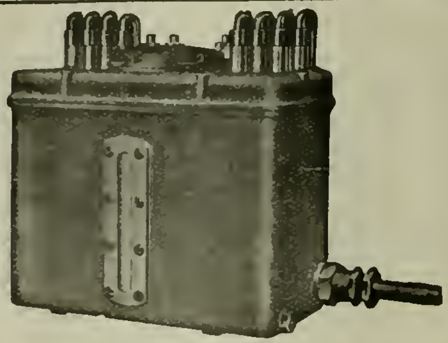

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Automobile Notes.

Competitors for the Park Trophy.

The entries for the trophy presented by Mr. W. E. Park, being contested to-day from Johannesburg to Potchefstroom, it is gratifying to remark, have come up to expectations. A number of names long associated with T.A.C. racing appear in the list of intending contestants, which shows that this event is as popular as on former occasions. Among the list of competing cars no less than five Talbots are numbered, the redoubtable Sunbeam being represented by two machines of that famous type. Others, new to South African racing, notably the Mettalurgique and Waverley, lend additional interest to this year's contest, and their performances will be eagerly awaited. Two Flanders cars appear in the entrants, while the Charron, Buick, and other well-known machines are also competing. A representative motorist gathering is expected at the club dinner to-night at Potchefstroom, from which place cars will resume the journey to Johannesburg to-morrow. The formula provides for a maximum of 25 miles per hour to be maintained, a speed with which competitors will alone be credited. In addition to the Park Trophy, the T.A.C. offer first, second and third prizes, and the Club non-stop medal will also be awarded those qualifying for same. The present holder of the Trophy, Mr. D. H. Saker, is absent in Europe at present, and is, therefore, debarred from defending his title this year.

Training Automobile Engineers.

The National School of Trades, established locally, is receiving much support in the training course of motor engineering, in which they are specialising. The value of such an institution is at once apparent, and from all accounts the standard of technical and other instruction reached by the promoters is very high. The entire course occupies some four months, during which time the student receives a thorough knowledge of the principles of the automobile from the practical standpoint, which the well-equipped machine shop affords. The technical side of the work referred to is not overlooked, and the evening lectures constitute a feature helpful in the very highest sense. Those, it may be remarked, who may not be in a position to secure a full course of instruction may confine their attention to any one particular subject; for example, driving may be chosen to the exclusion of other training, and a course in this branch be engaged upon by those so disposed on payment of a moderate fee.

T.A.C. Annual Speed Trials.

The T.A.C. purpose holding in September the annual speed trials and hill-climbing competitions, two events of much importance to the motorist community. The respective venues are not yet definitely decided upon, but all particulars, when available, will appear in these columns. The opinion is held in well-informed circles that these contests will eclipse in interest all previous competitions of this nature, promoted by the club, in view of the excellence of the machines which, it is understood, will take part in the events.

Growth of the Motor-Car Industry.

The growth of the motor-car industry in South Africa may be gauged from a comparison of statistics of imports for the years 1908 and 1911, the former being scarce £86,000, against £370,000 last year, and the returns, when available for the present year, it is expected, will afford even more striking figures in regard to this unprecedented expansion.

The Car in South Africa.

Mr. S. F. Edge, the prominent motorist who recently, with Mr. Jarrott, visited South Africa, is of opinion that the South African motors from necessity and not merely for pleasure. This fact, of course, is a natural consequence in a country where the leisured classes are practically non-existent, and reflects a compliment indirectly applied. The motor, however, according to Mr. Edge's idea, is indispensable for getting about the country, and this expert predicts a huge advance in the general industry, but reserves his statement in regard to new ideas. The results of this

The result of a special study of South African road conditions:

CONTINENTAL

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enthusiast's observations, nevertheless, are assuming concrete form, and will be embodied, so to speak, in the "Colonial Napier" car, which Mr. Edge hopes ere long to introduce to this country, a machine in every way designed to meet South African conditions, and those who recognise the wonderful mechanical bent of the enterprising head of the firm of Messrs. S. F. Edge, Ltd., anticipate in the new machine an exceptional acquisition in regard to the industry in these parts. The severe requirements of South Africa, exacted in the commercial motor vehicle, is also claiming the attention of Mr. Edge, and a specially designed car for the Colonies, it is understood, will result, embracing many essential features.

Here and There.

A club-room has been arranged for by the committee of the T.A.C. for their members at Dowell Buildings, Loveday Street. In addition to other facilities afforded, some authentic maps, it may be mentioned, are placed for the guidance of members, an important feature much appreciated.

* * * *

Considering the many prominent motorists who are undertaking the journey from the Rand to the coast by motor, it augurs well for the patronage which will be extended to the Johannesburg-Durban route when the work is completed.

* * * *

Much inconvenience is caused to small traders in Johannesburg through the practice, common to some motorists, of leaving their cars unattended in the less frequented streets during the time, often extended for many hours, while business is being transacted by them in other parts of the city. The culprit, who is invariably the week-end motorist from the district parts, is well aware that the larger concerns will not tolerate a proceeding of this nature, apart altogether from the vigilance exercised by the authorities in regard to premises situated in busy thoroughfares, hence the choice of the side street for the obstruction referred to. The patrolmen might give this grievance the attention it deserves, which in reality is more serious than at first sight appears.

* * * *

Johannesburg motorists will find the road to Henley-on-Klip in fair condition for touring at present, and the week-end spin may with safety be attempted in that direction. For the benefit of visitors it may be pointed out that it is intended shortly to offer to the place additional attraction in the shape of motor boats on the river, which, by the way, from the hotel is negotiable for some six miles.

* * * *

Insurance companies who undertake motor policies are not the least among the interested sections of the community, who anticipate with pleasure the enactment of the Bill, framed with the object of the licensing of all motor-car drivers. The risks, they conclude, with the coming into force of the Act will be considerably reduced, which heretofore attached to motor policies.

* * * *

The several serious accidents in Johannesburg streets, recently reported, in which motor-cars were implicated, are unfortunate, and contributes to strengthen, rather than tend to remove, the prejudice which exists against motorists in these parts.

* * * *

Quite too much road practice is indulged in by motor cyclists out Rosebank way week-ends, and more particularly on Sundays, compatible with the safety of ladies and

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their escorts who patronise the miles of excellent macadamised roadways leading to the northern suburbs, for their usual outings. The extraordinary speed of many cyclists in racing rig terrifies the pedestrian and others who use these roads, and encroaches on their privileges to an extent most unfair, and which calls for immediate attention from the proper quarters.

* * * *

The Continental pneumatic tyres are having an enviable run of popularity in South Africa, which, however, is richly deserved, having in view the successful efforts put forward by the manufacturers of this product, to conform to the peculiar requirements which the climatic conditions of the Sub-Continent exact. It is hardly necessary to refer here to the now well-known successes which attended the cars fitted with " Continentals " in the recent Grand Prix event.

* * * *

At the Krugersdorp Police Court, recently, quite a batch of motorists were mulcted in varying amounts for violation of the speed limit, from which it would appear that the West Rand authorities are determined on the due observance of the speed limit, ridiculous though it appears, considering the limited nature of the motor, and, in fact, all other traffic in this Reef dorp.

* * * *

Members of the South African Society of Motor Traders are reminded of a meeting for the discussion of several important matters relative to the industry, which is being held on Tuesday, 13th inst., at 5 p.m., at the offices, London House, Loveday Street. A large attendance is requested.

* * * *

The General Omnibus Company of London have decided to increase their number of vehicles in service from 1,500 to 4,000, another striking illustration of the triumph of the omnibus, despite the unenviable reputation it has achieved in point of fatalities, it being alleged that this form of locomotion recently has killed, per vehicle, nearly six times the number of persons in the Metropolis than has the tramcar.

* * * *

Recent statistics of imports of automobiles to the United States show a slight decrease, which, however, the manufacturers in that country predict will become more pronounced each year, a significant fact in point of the demand for the local production, which the makers are determined to confine, so far as possible, to the country of manufacture.

Portfolio of Commerce.

Speaking at the monthly meeting of the Chamber of Commerce, last week, Mr. A. F. Robinson, alluding to the Department of Commerce, said he felt sure that members would agree with the executive in its regret at the abolition of the portfolio of the Minister of Commerce and Industries. Since the executive meeting he had seen in the Press that not only was the portfolio to be abolished, but that the whole Department was also to be discontinued, and it was a matter of grave disappointment that the Government of the Union could not see its way to continue this Department, and give it that support which was necessary in order that it could fulfil the objects for which it was originally formed, and render to the commercial community of South Africa that assistance and co-operation which was due to it, and which, he regretted to say, had been so greatly wanting in the past.

* * * *

Reduced Railway Rates.

Reuter's Agency is authorised to state that reductions in railway rates are announced to come into operation on October 1 next, and involve the surrender of revenue to the extent of £335,000 per annum. This sum, added to an amount of £415,000 granted in the revision of rates, introduced on August 1, makes a total reduction in railway rates of £750,000. Although the total reduction of £750,000 was decided upon during the recent Parliamentary session, the balance of £335,000 was deferred pending the conclusion of certain negotiations with the Portuguese authorities. A settlement was arrived at with the Mozambique delegates at a meeting of the joint board which took place on the 1st inst. The forthcoming revision of rates is of a most important character. Reductions in rates will be afforded in two ways, firstly, by reducing the rates, and, secondly, by transferring certain commodities to the lower classification. The undermentioned figures give a broad indication of the extent of the reductions:—Amount of surrender per annum: Rough imported timber and South African wagon wood, £65,000; revision of port rates, £85,000; paraffin oil, windows, doors, common window glass, tram rails, and accessories for agricultural and industrial purposes, £37,500; agricultural and dairying machinery and implements and windmills, £36,000; galvanised iron, £30,000; timber, planed, grooved, and tongued, including ceiling and flooring boards, £32,000; imported cement, £22,000; fencing material, £7,500; total, £335,000. The chief benefit of the above reductions will be felt in the Transvaal and the Free State, but the reductions are also given in Cape and Natal Provinces, particularly to portions of those Provinces situated from the coast. In connection with the revision of port rates, opportunity is being taken to remove certain inequalities in rates that at present exist owing to the present rates having been framed at a time when Cape, Natal and C.S.A.R. lines were controlled by Administrations whose interests were not identical. For example, the rates from Lourenco Marques to stations in the Eastern Transvaal are much higher than the rates from Union ports for corresponding distances. Certain anomalies also exist in relationship of rates from Union ports to Western Transvaal and to Modderpoort district in the Free State. The reductions in rates are afforded throughout the Union in respect of the commodities mentioned above, and also on all articles in tariff 5, the principal of which are bonawood shooks for making packing cases, bottles and jars, and tin plates. The reductions in tariffs 348 and 13, however, apply only to places situated more than 200 miles from the ports. The principal articles affected in these tariffs are bar rod and angle iron and steel, preserves, candles, resin, hops, empty packages, new and old trade vehicles, rough iron, printing paper, roofing materials, raw materials for the manufacture of soap, candles, and dynamite, piping, spraying materials, sheep dips, farm seeds, cattle food and malt.

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NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Twenty-Third Annual Ordinary General Meeting of Shareholders in the above Company will be held in the Board Room, Exploration Building, Commissioner Street, Johannesburg, on TUESDAY, the 29th day of OCTOBER, 1912, at 12 noon, for the following purposes :—

1. To receive the Directors' and Auditors' Reports, Balance Sheet, and Profit and Loss Accounts for the year ending 31st July, 1912.
2. To elect two Directors in the place of Messrs. S. C. Black and E. Friedlander, who retire in terms of the Articles of Association, but, being eligible, offer themselves for re-election.
3. To confirm the appointment of Mr. E. J. Renaud as a Director of the Company.
4. To elect Auditors for the ensuing year, and to fix the remuneration for the past Audit.
5. To transact any other business which may be transacted at an Ordinary General Meeting.

The Transfer Books of the Company will be closed from the 23rd to the 29th October, 1912, both days inclusive.

By Order of the Board,

Compagnie Française de Banque et de Mines, Secretaries.

Per C. H. HOLDER.

Head Office, Johannesburg,
6th August, 1912.

The Knights Deep, Limited.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Fourteenth Ordinary General Meeting of Shareholders in the above Company will be held in the Board Room, Consolidated Gold Fields Buildings, Simmonds Street, Johannesburg, on FRIDAY, 25th OCTOBER, 1912, at 11 o'clock in the forenoon for the following purposes :—

1. To receive the Reports of the Directors and Auditors, and to consider the Balance Sheet as at 31st July, 1912, and Statements of Working Expenditure and Revenue for the year ended 31st July, 1912.
2. To elect two Directors in the places of Messrs. E. A. Wallers and D. Christopherson, who retire by rotation, but are eligible and offer themselves for re-election.
3. To appoint Auditors for the ensuing year and to fix the remuneration for the past audit.
4. To transact such other business as may be transacted at an Ordinary General Meeting.

The Transfer Books of the Company will be closed from 14th to 25th October, 1912, both days inclusive.

By Order of the Board,

The Consolidated Goldfields of S.A., Ltd., Secretaries.

Per J. D. LOW.

Head Office : Consolidated Gold Fields Buildings,
Simmonds Street, Johannesburg,
6th August, 1912.

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SMALL HOLDINGS COMMISSION.

IT IS HEREBY NOTIFIED for general information that a Commission has been appointed under Government Notice No. 993, dated the 17th July, 1912, to inquire into and report upon the following matters :—

1. The necessity for providing land in or near mining and industrial centres within the Mining Districts of Johannesburg, Boksburg and Krugersdorp, in the Transvaal Province, for establishing small holdings and for the settlement thereon of persons engaged in mining or industrial occupations.

2. The extent of land available for effective occupation and in connection therewith—
   - (a) the class or classes of persons for whom provision should be made;
   - (b) the extent to which land laid out as small holdings would be taken up;
   - (c) the form of land tenure to be granted and the conditions to be attached thereto;
   - (d) the conditions under which the land should be allotted.

3. The legislative changes, if any, for carrying out any scheme found to be necessary.

Any person wishing to give evidence before the Commission should send their names to the Secretary, P.O. Box 1016, Johannesburg.

The Commissioners suggest that persons engaged on any particular mine or in any particular industrial occupation, wishing to give evidence before the Commission should appoint a committee to lay their statements and suggestions before the Commission, and furnish the names and addresses of some responsible persons to whom notice of any meeting may be sent.

The first public meeting of the Commission will be held in Room No. 21, First Floor, New Law Courts, Von Brandis Square, Johannesburg, on Monday, 26th August, 1912, at 10 a.m.

A. T. BROOK, Secretary.

Johannesburg, 29th July, 1912.

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Notes and News.

Native Affairs.

We are glad to learn that General Hertzog, Minister of Native Affairs, is taking a leaf out of the book of the Minister of Mines, and is setting about the study of native living conditions in the Northern Transvaal. This week General Hertzog is visiting the Northern districts with a view to studying the extraordinary prosperity which now blesses native dwellers in those parts.

* * * *

Native Labour Position.

The report of the Chamber of Mines shows that the number of natives employed by members of the Witwatersrand Native Labour Association, including contractors' boys, was 207,256 at the end of July, as compared with 212,573 at the end of June, showing a loss of 5,317 in native labour strength for last month. The loss for the corresponding month of last year was 4,991. A very gratifying feature in the position of East Coast labour coming from south of latitude 22 degrees S. is found in the proportion of old mine boys who re-engage. During the period from January to June of this year over 78 per cent. of the natives coming to work here were old mine boys, and last month this percentage had actually risen to over 81 per cent. Natives from what is known as tropical areas, that is, from the districts north of latitude 22 degrees S., are only permitted to enter the Transvaal during the period from 1st August to 31st March. The practice is to detain them in the Witwatersrand Native Labour Association compound for one month after their arrival in order that they may recover from their long journey, be properly fed, and become used to the changed climatic conditions before they start work on the mines. There were received this month so far in the compound of the Witwatersrand Native Labour Association 958 natives, but as these will only be allowed to go to work on the mines at the beginning of September, they will only appear in the September return of natives employed.

* * * *

Care of Natives.

In dealing with the labour question, on Thursday, at the Chamber of Mines meeting, Mr. Elkan pointed out that every care is being taken that only natives of apparent good physique come forward. They are medically examined not only at the point of embarkation but again at Ressano Garcia, and in all cases where necessary natives who have not, in the opinion of the medical officers, sufficient stamina for mine work are returned to their homes free of charge. On arrival at the Witwatersrand Native Labour Association compound these natives are subjected to a third strict medical inspection in order to detect any necessity for further rejection, and finally, each mine, before accepting them, again subjects the natives to a medical inspection, and no weaklings are put to work, but are returned to their homes. Reports having reached the Executive that endeavours were being made to induce the authorities to allow an increase to be made in the advances to natives, which, under the provisions of Act No. 15 of 1911 are limited to £2 per native, they approached the Minister for Native Affairs on the point, and were very glad to receive his assurance that there is no intention at present to make any change in this respect. In the past much larger sums than the amount now legal were advanced to natives, with very disastrous results, and the Chamber has no wish to depart from the policy hitherto pursued of keeping the figure as small as possible.

* * * *

Royal Technical College, Glasgow.

The Fourth Annual Dinner of Former Students of the Royal Technical College, Glasgow, will be held at the Grand National Hotel, Johannesburg, on Saturday, 28th September. Tickets can be obtained from the honorary secretary, Mr. Jas. Gray, Box 5254, Johannesburg. In view of the Royal distinction recently conferred on the College, it is hoped to make the event an even greater success than usual.

Small Holdings.

The Small Holdings Commission was referred to in very sympathetic terms by the President of the Chamber of Mines on Thursday. He said: "The Chamber welcomes a Commission of this nature, and is absolutely in sympathy with the general principle of small holdings for employees on mines. Small holdings of this nature would tend to establish more stable working conditions and to check the Bedouin habits of the average miner. You will notice that the Commission is restricted in its inquiry to the mining districts of Johannesburg, Boksburg, and Krugersdorp. I regret that restriction. The application of the principle to the Reef under proper safeguards may, and one might hope would, effect in some measure its purpose; but it seems to me that the principle would undoubtedly apply with at least as great benefits in the outlying districts. The application of the principle to the Reef is by no means free from difficulty. A sub-committee of the Chamber has been formed to consider the various matters referred to the Commission, and the application of such a principle to the necessities of mining. Its views will be submitted to the Chamber, and, in all probability, in response to the invitation of the Commission to the Chamber for suggestions as to the carrying out of the scheme, having regard to existing conditions, evidently will be given on behalf of the Chamber. The amount of land available would be largely affected by the nature of the tenure required. Whether or not legislative changes are necessary cannot be stated at the moment. All these matters will be sifted by the Chamber, and I can only hope that the result of the Commission's enquiries will lead to the establishment of small holdings on lines satisfactory from the point of view of safeguarding existing mining interests, and of encouraging employees to regard stability of employment in the neighbourhood of a permanent home a great consideration."

* * * *

Miners' Phthisis Act.

Mr. F. D. P. Chaplin at Germiston, and Mr. M. G. Elkan at the Chamber of Mines meeting on Thursday, made important references to the Phthisis Act. The latter, in the course of his remarks, drew attention to the fact that Section 15 of the Act lays down that, on the one side, any employer, or, on the other side, any number of miners not being less than one-third of those employed on any particular mine, may petition the Minister, on the ground of the improved conditions of the mine, to remove such mine from the list, or to reduce the contribution payable in respect of such mine by the employer and the miner. The exemption of a mine from contribution would mean that both the mining company and its miners would no longer have to contribute to the fund, and it is therefore hoped that mining companies and miners will combine in order to establish absolutely satisfactory conditions on their respective properties, so that the Minister would be justified in due course not only in reducing the contributions, but even in eliminating an absolutely "dust free" mine from the list of contributors. Mr. Elkan added: "It is up to the miners themselves, at least as much as to the management, to see that no carelessness is permitted, that all regulations are religiously observed, and that offenders are promptly brought to book. Only if it is realised by all concerned that frank co-operation is absolutely necessary, can it be hoped that the conditions will be improved to such an extent that the Minister will be justified in reducing the present scale of contributions to the fund."

* * * *

Main Reef West Rumours & Actualities.

Numerous unfavourable reports have been current on the Stock Exchange during the past week regarding the Main Reef West. The official statement for the three months ended 30th June last does not, however, disclose any unsatisfactory features. Excluding ore passes and prospecting work, 80 per cent. of the development work has been on Leader, or Main Reef and Leader combined, and of the 2,204 feet sampled slightly over 50 per cent. has been returned as payable, having an average value of seven dwts. over 48 inches. More development was done than in the preceding quarter, although the average value over the total footage driven is slightly less. On the other hand, the profit at £31,108 compares very favourably with £23,683 earned in the preceding three months, and now that the No. 5 shaft is supplying its proportion of rock for the mill, and is materially relieving the pressure at the No. 4 shaft, the outlook for lower working costs is distinctly good. The whole equipment at the No. 5 shaft is now working most satisfactorily. As was stated in our issue of a week or two ago, a change in the management of this property is being effected, Mr. Healey taking over from Mr. C. H. Spencer the charge of the Consolidated Main Reef as well as of the Main Reef West.

* * * *

Mooiplaats.

It is stated that the small battery which was working some months ago on quartz from the western end of the low hill which runs across Mooiplaats, a few miles south-west of Roberts Heights, will shortly be put into commission again. The ore body is associated with a mass of diabase which has burst through the dolomite, and has no resemblance to that being worked several hundred yards to the south by the Pretoria Premier Gold Mine, Ltd., on Knoppieslaagte. The reef opened up by the latter is the Kromdraai reef, which, as is commonly known, is an interbedded quartz reef below the horizon of the Tweefontein reef. We learn that crushing has now commenced at the Pretoria Premier.

* * * *

More About Detachable Bits.

Perhaps the day will come when the miner, instead of going on shift with half a skip load of drills sent down from the blacksmith's shop, will carry to his work the drill bits necessary for his eight hours labour in a small sample bag, possibly in the pockets of his coat. This may seem like gazing far ahead into the nebulous possibilities of the distant future, but we believe that some drastic reforms in the implements employed in the everlasting battle of man against Mother Rock are coming, and coming at no distant date. A detachable drill bit, provided it could be clamped on to the steel sufficiently tightly, would clearly be a distinct advance in mining. It would save the vast amount of time and expense entailed in sending steels to surface and returning them to the underground working faces. We have already referred to the very encouraging results secured at the Knights Deep with detachable bits, and we now learn that the experiments are proceeding most satisfactorily, and indicate that such a method may become approved and general practice at an early date. Simultaneously with the carrying out of experiments on these detachable bits, the Knights Deep management are continuing the tests carried out at the Robinson Deep on drill steel, and it certainly appears that important new innovations in mining practice are likely to be evolved. The prospect of a miner going to his work with his steels in his pockets is certainly alluring.

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African & European Investment Co.

At the meeting of the African and European Co., in mail week, the speech made by Mr. C. F. Rowsell was of a most cheerful nature. The company possesses 1,279,185 acres, of which, approximately, 250,180 acres are in British Bechuanaland. The rise of land values has induced the directors to pursue a more active land policy than hitherto. A better class of tenants is being secured for the farms, and a larger revenue is being derived from them. The company's land is represented in its books by the figure of £636,747, which includes all improvements such as buildings, fencing and the sinking of wells, but does not include the before-mentioned 250,000 acres in British Bechuanaland. The company's interest in Vereeniging Estates is very large. These estates embrace 126,230 acres in a compact block on either side of Vaal River. Vereeniging Company is operating a coal mine, from which 25,000 tons per month are being produced, and this quantity is likely soon to be increased to 30,000 or 40,000 tons. Vereeniging is largely interested in Victoria Falls and Transvaal Power Co., and its estates have been described by a recent visitor as of a "remarkably encouraging character." The Chairman concluded: "If you carefully consider the facts, you will have no hesitation in setting upon the great land holdings of this company a value certainly far above the figure at which they at present stand in the books."

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Eldorado Banket Gold.

Elsewhere we review the annual report of the Eldorado Banket. The consulting engineer, in concluding his report, says:—"I consider the year under review has been most successful, and I see no reason why the present returns should not be maintained for some time to come. At the same time the importance of rapid development with the object of augmenting the ore reserves is constantly before us, and I fear before the new main vertical shaft is completed a further decrease of ore reserves will be recorded. A new system of calculating the exceptionally high grade ore was introduced last December, which, in my opinion, is quite correct. Exceptionally high grade ore is always difficult to deal with, but it is evident from the milling returns that the deductions in the past have not been sufficient: for instance, in March, 1911, the ore reserves were valued at 16·3 dwts., while the grade of ore milled was 12·43 dwts. The reserves for the year under review are valued at 15·13 dwts., which, in my opinion, is about 2½ dwts. too high, and the more drastic reductions now in force will gradually right this."

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The Robinson Deep's New Plant Starts Up.

The additional new tube mill plant at the Robinson Deep recently commenced work. The 300-stamp battery has been reconditioned, and five additional tube mills have been erected, thus bringing the total ore-reducing capacity of the plant up to 300 stamps and 10 tube mills. One of the new tubes came into operation last month. There were thus 210 stamps and six tube mills at work, and in the future all ten mills will be operated and a lesser number of stamps employed. The Robinson Deep has for a long while past been in the position of having a larger stamping equipment than the mine is capable of supplying. Ninety stamps have been idle for months past, and the policy that it has been agreed on shall be adopted in the future is to hang up 140 stamps and operate ten tube mills instead of five, as in the past. Clearly, the object aimed at is an increase in the proportion of slime produced, as in the new metallurgical scheme there will be one tube mill to 16 stamps instead of one to 42 stamps, as in the past. The new pebble bins have a capacity of about seven tons each, and being situated immediately adjoining the feed end of the tube mills, they deliver rock automatically by means of Schmitt's patent feeder.

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A New Factor in the Coal Industry.

The Vaalbank Coal Company, Ltd., which must not be confused with the Vaalbank (Middelburg) Colliery Co., Ltd., evidently intend to adopt an active policy in regard to their property. Mr. J. G. Howard, who has been manager of the Transvaal and Delagoa Bay collieries for some years past, has accepted the post of manager of the Vaalbank, and commences his new duties in the course of a week or two. In all, we understand, four pits have been sunk, and it is hoped to commence production on a large scale in the near future. It would scarcely appear, at this juncture in the history of the coal trade, that a new producer, and possibly a competitive factor of much importance, will be altogether welcome in the Witbank area. Without the much-needed co-operation and material support in the form of railway rates on the part of the railway authorities, the collieries of the Witbank-Middelburg area are not likely to find any new or substantial markets, and in this case the presence of a new and important colliery would scarcely tend to strengthen or improve the basis on which the Transvaal coal trade has been established.

TOPICS OF THE WEEK.

THE DEARTH OF MINING PROPERTIES.

THE theory and practice of mining have been fully exploited by writers on technical subjects. The geology of ore deposits has been discussed by scores of writers, and the results of discussion and investigation have been given to the public in various forms. The problem of reporting upon undeveloped prospects, however, is one which has received but scant attention. Mr. C. Godfrey Gunther, E.M., who claims to write from the point of view of the prospector in the United States, and who has dealt with the matter at some length in a book entitled "The Examination of Prospects," observes that the demand for good properties greatly exceeds the supply. That is pretty much the position of affairs in this country, it is said, although a more correct way of putting the case would, doubtless, be to say that the demand for good properties greatly exceeds the number of those which are considered to be good by the engineer whose business it is to report upon them. We remember to have heard, not long ago, of a mining engineer in the United States who had examined, directly or indirectly, the alleged merits of a vast number of properties offered to his principals, and found, after some years of this occupation, that only an infinitesimal number of them had proved sufficiently excellent to pass muster under his severe system of examination. If memory serves us well, he made a similar observation to that recorded above by Mr. Gunther. The matter is of some interest in view of the enormous mineralised area of this country, which appears so full of promise, but which, for some reason or another, has shown few prospects, outside the Witwatersrand, which have been considered worth taking in hand and developing upon anything like a large scale. The question which readily suggests itself, in face of this condition of things, is whether the prospector is insufficiently enterprising, or the average examining engineer quite as courageous or discerning as he might be.

"Owners generally suffer from extreme optimism," remarks Mr. Gunther, "and many engineers, from excessive professional timidity, and neither is willing to meet the other half-way. Owners of prospects are usually brought to their senses after repeated unfavourable examinations, but many engineers more often make a favourable report because of the risk of personal reputation." Extreme optimism on the one hand and excessive timidity upon the other are, of course, a bad combination if a prospect is to have a reasonable chance of showing its worth, but either condition separately, particularly the latter, may easily account for a great deal of that want of adjustment between supply and demand in the matter of good properties which appears to prevail in most parts of the world. It cannot be said that an unduly sanguine temperament on the part of prospectors is an obstacle to business in the Transvaal and adjoining territories, for it has come to be recognised by this class of person that cash payments of any magnitude are obsolete, and that the financial groups are too few, and on too friendly an understanding with each other, to permit of anything like competition amongst themselves, except in very rare circumstances. We are left with the other alternative, therefore, the "conservatism," namely, of the examining engineer. It is not to be denied that engineers trained in the strict school of the Rand, where the study of mining costs has arrived at a degree of completeness which is probably unequalled in any other metal mining district in the world, are prone to be exceedingly critical. There is, moreover, the mental bias which arises from experience based largely on deposits of a peculiar and unique kind. Neither of these factors, however, seems sufficient to explain the want of expansion of exploratory work in those outer districts of the Transvaal, not excluding the tin fields, which is becoming more noteworthy year by year. A large number of claims are held in various districts, as is evident from the statistics of the Mines Department; periodically there are spasmodic rushes when every peggable portion of ground in one district or another is taken up, and periodically, in turn, this ground is abandoned. The same old pack of cards, so to say, is shuffled over and over again, *ad libitum*, but there is nothing new. The real want of the country, it appears to us, is not so much prospects, as the prospector. The class is dying out, and it is not difficult to learn that the cause of the disappearance of the "old-timer" is the want of encouragement from those who are able to give it. The Government is blamed in one direction, and the financial houses in another. Each has the perfectly sound argument, in reply, that business principles are their only guide in these matters. It is, nevertheless, to be regretted that some scheme of furthering the work of the old "fossicker" in the outer, more or less unknown, parts of the country cannot be devised by the Government or the community. The necessity of enlarging the field of investigation and intensifying its operation has been experienced in older mining regions than this one, and it is no wild dream of fancy to foresee the day, not far distant, when a similar necessity may present itself to the population of the Transvaal.

REDUCTION OF RAILWAY RATES.

Since we dealt with the meaning of the railway rate reductions, last week, some further estimates of economies rendered possible thereby have appeared, which call for comment. A list prepared for the President of the Chamber of Mines shows the following reductions on articles of particular interest to the mines:—Tram rails, by 29s. 2d. per ton; building material, such as doors, architraves, mouldings, etc., by 20s. per ton; ordinary timber, by 24s. 2d. per ton; imported cement, by 11s. 2d. per ton; galvanised iron, by 27s. 6d. per ton. The Railway Administration estimates that, in consequence of these reductions, it is surrendering: On rough imported timber, £95,000; on planed imported timber (ceiling and flooring), £32,000; on doors, windows, tram rails, and accessories, also paraffin, £37,500; on galvanised iron, £30,000; on imported cement, £12,000; making a total on these lines of £206,500. It is anticipated that a considerable portion, if not most of this amount, should go to the benefit of the mining companies. Nor must we forget the material saving in the working expenses of the gold mines which has taken place as from the 1st of this month, owing to the reduction. Though it is, of course, impossible to give absolutely accurate figures—they must of necessity fluctuate at all times—the President of the Chamber of Mines has, however, worked out, on what may be considered safe lines, the saving to the gold mining industry from the coal rate reductions. On an average the mines of the Witwatersrand, together with the power stations, consume 250,000 tons of coal per month. Taking this figure, and making due allowance for the different quantities consumed at the various points from one end of the Reef to the other, it is found that a fair average of the reduction which has been made amounts to 1s. 4½d. per ton of coal, or, on the aforementioned tonnage, a saving of £17,187 10s. per month, or £206,250 per annum. If we deduct this sum of £206,250 from the working costs of the gold mines it will be seen that the reduction is indeed a very appreciable one. Last year 23,888,258 tons of ore were milled on the Witwatersrand, and if this reduction in the railway rates on coal had then been in force it would have meant a decrease in the working costs of 2·07d. per ton milled. On a very conservative basis this is the direct benefit we may calculate on. Among other reductions in the railway rates is that of one shilling per ton on coal carried coastwards for the purpose of being exported, but this is, on all hands, agreed to be inadequate to gain the end in view.

At the Chamber of Mines meeting, on Thursday, the President gave evidence of the broad-minded anxiety of the Chamber to advance industries, other than that of the Rand. His plea for Government sympathy for the coal export trade should, therefore, carry great weight. For a coal export trade, round coal only is required, leaving the small coal for the consumption of the mines and the power stations, and this is precisely the class of coal which the latter require. It is cheaper and good enough for that purpose. If, then, the collieries succeed in building up an export trade for their production of round coal, they will be in a position to supply the mines with larger quantities of small coal—the class which the mines really prefer to take. It may even be presumed that the collieries would thereby be able to reduce the price which they charge for mine coal to a lower figure than they must obtain to-day to enable them to live and pay a small return to their shareholders. Even a reduction of only 3d. per ton of coal would mean a saving to the gold mines of approximately £37,500 per annum, but once a satisfactory export trade is built up the decrease, Mr. Elkan thinks, would stop at this figure. "Let us," concluded Mr. Elkan, "appeal to the Government to deal out equal favours to the collieries. It would not only benefit the collieries—we shall share in the advantages gained—and last, but by no means least, the whole of South Africa. It would mean an increased income to the Exchequer in the shape of revenue obtained under the Precious and Base Metals Act, 1908, and larger railway receipts in respect of the coastward traffic, instead of having to send empty trucks to the seaports, but, above all, it would bring large amounts of foreign capital to this country."

VICTORIA FALLS POWER.

The annual report of the Victoria Falls Power Company for 1911 confirms the company's assertion that no real disturbance had taken place in its regular service, and the financial results are an improvement on those for 1910, even if they do not come up to previous anticipations. Speaking of the progress achieved by the company and by the associated concern, the Rand Mines Power Supply Company, the directors remark:—The results obtained from all the stations continue to give entire satisfaction, and now show an increase in profits month by month. The erection of the two companies' power stations have practically guaranteed a regular supply of power to the Rand mining industry at a very reasonable price, with the result that the companies have received demands for an increased supply of power from consumers, who are entitled under long term contracts to be supplied with all the power they require. The two undertakings have secured applications for electric power amounting to 67,000 horse power, and in addition the Rand Mines Power Company has obtained applications for 66,000 horse power in compressed air. The total notified demand is therefore 185,000 horse power, whilst the capacity of the combined plants of the Companies, when all extensions to stations are completed, will be 232,000 horse power. This shows substantial development, and that earning capacity has improved since the end of the year is evidenced by the figures of monthly earnings given in the debenture prospectus in May, which indicated that receipts for the first quarter had more than trebled as compared with the corresponding period of 1911. The accounts bear out the improvement of business claimed by the directors in their report. The trading profit has gone up from £155,200 to £325,000, whilst interest, etc., has brought in £13,300, as compared with £20,100. The advance in total income is £163,000. Administration expenses in London and in Africa amount to £15,200, as against £17,600, leaving the net revenue £323,100, as compared with £157,700. Since incorporation the net revenue has risen as follows:—1907, £45,100; 1908, £56,900; 1909, £58,500; 1910, £157,700; 1911, £323,100. The above figures are before allowing for debenture service and depreciation. In 1910 debenture interest absorbed £82,600 and depreciation £39,000; the surplus for the year was therefore £36,100. Last time, however, £75,900 was also written off for depreciation in respect of 1907, 1908 and 1909, but this may fairly be taken as a deduction from the balance of revenue—£135,400—brought over from 1909. The sum brought into the accounts in 1910 was £59,500, which with the surplus for the year gave a total available balance of £95,600. Out of this the 1 per cent. preference dividend in arrear for the last quarter of 1908 was paid, and also the full preference dividend for the first nine months of 1909. These payments absorbed £57,900 and left £37.800 to go forward. Thus the preference interest paid in 1910 fell short of being earned by £21,800. In respect of the past year a larger amount of both debenture and preference capital ranks for return. Debenture interest has increased by £42,100 to £124.700 and the depreciation allowance is £22,300 higher at £61,300. After meeting these the surplus is £137.100, or £101.000 better than last time and fully covering the year's preference dividend. The actual amount distributed, however, covers the fifteen months to the end of 1910 leaving the interest for 1911 in arrear. The amount carried forward is £45.700, or £7,900 more than was brought into the accounts. At the present rate of earnings there should be no difficulty this year in again providing a full twelve months' preference dividend, though to what extent arrears will be reduced is a moot point. The first mortgage debenture interest will be heavier and also the depreciation allowance will probably be increased, and in addition there will be nearly half a year's interest to find on the second mortgage debentures issued in May. Only three years ago the profits for 1911 were put at £520,000, and it was anticipated that the preference shares would get 10 per cent. and the ordinary 5 per cent. That prospect is now rather more remote. Though the returns have sadly fallen short of anticipations, the business of the company is thoroughly sound and is steadily extending.

CREDIT FACILITIES FOR THE "SMALL MAN" IN MINING.

Increased credit facilities for the "small men" in mining appear to be one of the most urgent needs of that class to-day in South Africa. Our columns have lately contained testimony from several different quarters in regard to the abnormal difficulties the small mine-owner is faced with in the endeavour to finance his property through the stage of development or expansion. Moreover, the Government appears to recognise no liability to extend to the "small man" aid similar to that it has rendered so readily in the case of agriculture; and mining on all but the grand scale is left to shift, therefore very indifferently, for itself. In this connection the reduction of the State vote for direct financial assistance to small mines from £10,000 to £5,000 this year is, to our mind, a deliberately retrogressive step. In giving evidence on the subject before the Select Committee on Public Accounts at Capetown recently, Mr. Warington Smyth, the Secretary for Mines, admitted that the small mining man, if forced to come to Johannesburg to obtain credit, was inevitably called upon to sacrifice a big slice of his assets, if he were to succeed in raising any money at all. Last week we printed a striking confirmation of this deplorable state of affairs from the Pilgrim's Rest district, where the "small man" is making his last stand in the Transvaal; and a few weeks ago a Rhodesian correspondent sent us a similar, strongly worded plaint from the small workers of the north. Over and over again in these columns we have represented the wisdom of extending State financial aid to the outside districts, but the appeal has never succeeded in moving a Government apparently congenitally unable to sympathise with the aspirations of the "small" miner and prospector. Of course, it may be argued, as General Smuts has argued, that States—such as those of Australia—that have made advances to "small men" have invariably been left with a legacy of bad debts as a result of their incursion into the risky realms of mining finance. The short answer to this is (a) that there must be a safe and happy mean between Australian prodigality on the one hand and South African parsimony on the other, and (b) that any direct monetary loss to the State incurred under this head is more than offset by the many indirect benefits accruing from the encouragement of mining activity throughout the country. Possibly, it may not yet be too late to try to convince the Government that it is losing a valuable opportunity in this direction to advance the industrial interests of the country. First, it may be necessary to glance at the use and function of credit institutions generally, and at the justification for the existence of purely mining banks in other countries.

The work of a credit institution may be described as the custody of surplus funds of those who have money but have no immediate use for it, and the supply of money or credit to those who, though they have it not, have need of it, and can offer security (real or personal) for its repayment. The method by which this work is carried out is, in the ordinary course, by taking money on deposit and by issuing notes and drafts in exchange for cash; and by employing the capital thus raised and the concern's own capital in making advances on proper security, in discounting bills, and in investments in various kinds of securities. The work of a mining bank is distinguished from that of an ordinary bank simply by the fact that it exists to supply money not to anyone whomsoever who can offer good security, but only to persons who can offer such security and at the same time belong to a particular class—the class, that is to say, of those who carry on the business of mining, and need money for the conduct of that business. What reason, it may be asked, can there be for the existence of a bank restricted in its dealings to this one class of persons? Should the mining man not be able to get his requirements from the ordinary bank in the same way as the merchant and the manufacturer obtain what they want? The answer to these questions is clear. The miner has his own peculiar needs, different from those of the merchant and the manufacturer. These needs, in the majority of cases, the machinery of the ordinary bank, fashioned primarily to meet the wants of the merchant and the manufacturer, is ill designed to fulfil. The result is that either they must remain unsatisfied, or special machinery must be designed to satisfy them. It is the function of the mining bank to supply that machinery: or perhaps it would be better to say that the mining bank is that machinery, and that the special needs of the miners of any country will be well or ill met accordingly as the mining bank system of that country is well or ill devised to cope with them. Now, what is it that constitutes the important difference between the credit needed by the miner and that needed by the merchant and the manufacturer? What peculiar circumstance makes the machinery of the ordinary bank unsuitable to the purposes of the man who makes his living from mines? To answer this question we must glance first at the distinguishing features of mining, and then at the business methods of other spheres of activity. The merchant buys his stock with a reasonable hope of being able to dispose of it quickly. If he has a steady volume of business, he can so gauge his requirements as never to have an unduly large stock on hand for any great length of time; and if he is well versed in his business he turns his working capital over several times in the course of the year. The manufacturer is in much the same position. With modern processes the minimum of time is spent between the purchase of raw materials and the sending out of the finished product. Therefore, the manufacturer also, except in the case of special classes of goods, can turn his working capital over several times in the twelvemonth. Both merchant and manufacturer, further, have a live and moving business. Money comes in daily from purchasers, and must be paid out daily to sellers; and the organisation of modern business has made it a comparatively simple matter to tell when particular payments may be expected to come in. With the farmer again it is different. He plants a crop at the proper season, and must wait for months before he can expect to gather it. All this time there is no money coming in. He has to spend continually, and can only hope to get a penny back when he has reaped and sold his crops. The date of his reaping and selling can never be accurately forecasted. The loan which he requires is a long loan which he can renew without difficulty in case his crops disappoint him, and which he will not be called upon to repay at an awkward moment. To meet the needs of the farmer, the South African Government has supplied an excellent land bank. To meet the needs of the small mineowner has never been anybody's business.

Other important factors, of course, enter into the consideration of the question. The ordinary bank is formed in order to earn a profit for its shareholders. It must transact the business which will bring in most money in the shortest space of time. It must invest its funds in quick, briskly-moving business, discounting short-term bills where possible, and taking care to earn commission on its capital as many times as possible during the year. Where it can employ one hundred pounds by discounting four or more bills during twelve months, it will obviously be bad business for it to lock up that sum in a single loan for the same term. The result is that the bank has to lay itself out for the business of the merchant and the manufacturer, who, as we have seen, have a current of brisk business which enables them to calculate beforehand when they will be able to meet their acceptances, and also enables them to turn their money over several times during the year. The bank keeps the merchant's current account, and can tell almost in a moment how his business is faring. If it notes a falling off, it knows that it must draw in the reins of credit; if things are brisk, it can judge how far it can safely slacken them. The small mining man, on the other hand, lives at a distance, and it is impossible to watch his financial position. Loans, when made, must be made only on the amplest security, and to men of considerable substance. There cannot be much lending on note of hand, and in most cases a bond must be passed. It is, however, by means of bills that a modern bank contrives to carry on its business. If it has a large portfolio of soon maturing bills, the problem of funds for a run of business need never trouble it seriously. When its own cash runs short, it easily secures more by discounting bills which it holds with some other bank. Any investment of cash in a security which cannot easily be turned again into cash makes the difficulty of finding funds which may be suddenly required more severe. The result, again, is that the bank can only look to the mining interests after the needs of the merchant and the manufacturer have been satisfied. Its dealings with the miner will be limited by the amount of cash for which it can find no employment in the business of the townsman. It will only be able to lend to the mining man to any large extent when trade is slack, and even then it will have to protect itself by reserving the right to call up the loan at short notice should there be a revival. It is precisely in this respect that it fails to meet the ordinary wants of the small man. Where he requires a loan for twelve months with security against untimely calling up, it can only offer him a three-months loan without reasonable certainty of renewal. The result is that no mining man will go to a bank unless he is absolutely compelled to; and then he goes not in order to find help for future profit, but in order to get out of past difficulties. There is none of that ready borrowing and lending on which the huge fabric of modern commerce and industry has been built. To the merchant or manufacturer cheap and ready credit is the very life-blood of his business, and he obtains it freely when he requires it. The small mining man, to whom it ought to be as necessary and as free, can only obtain it grudgingly and under restrictions which, if rigidly enforced, would mean heavy loss to him. And so it is that a special type of bank is necessary to dispense credit to the small mineowner on such terms that he can safely take it. The bank must exist for one type of client alone, and its mode of business must be fashioned to meet all the legitimate wants of that class of client as fully and as readily as the ordinary bank meets those of the merchant and the manufacturer. Plainly, South Africa, which has profited so much from following the example of other countries in regard to land banks, has also much to gain by likewise providing an institution to grant reasonable credit facilities to the small mineowner.

Main Reef West.

The report for the quarter ended the 30th of June on operations at the Main Reef West states that from 54,612 tons milled, 21,353.019 ozs. of gold were recovered, the estimated value of which is £89,662. Working expenses amounted to £58,553, or 21s. 5.18d. per ton, which left a profit for the three months of £31,108, or 11s. 4.634d. per ton. The capital expenditure for the quarter was £14,829. The east main incline shaft was sunk and timbered 27 feet to 3,615½ feet, or 212 feet below the 11th level, the total footage made being 3,090 feet. Excluding the ore passes and prospecting work, 2,418 feet, or 80.2 per cent., has been on leader or main reef and leader combined, and of this 2,204 feet have been sampled, giving an avearge value of 5.2 dwts. over 48 inches. Of this 1,117½ feet, or 50.7 per cent. has been payable of an average value of 7 dwts. over 48 inches, and 1,086½ feet, or 49.3 per cent., has been unpayable, of an average value of 3.3 dwts over 48 inches. The ore reserves are being adjusted for the year, and will be shown in the annual report. On shaft sinking at No. 5 shaft 315 feet have been sunk and timbered, making a total depth to date of 3,030 feet. In addition the station at the 13th level has been cut and ore bins sunk at the 11th level. No. 5 shaft is now supplying its proportion of rock for the mill and has materially relieved the pressure at No. 4 shaft and also considerably reduced the tramming costs. The whole equipment at No. 5 shaft is working most satisfactorily.

Consolidated Main Reef.

The quarterly statement of operations at the Consolidated Main Reef Co. to the 30th June shows that from 69.329 tons milled 23,436.554 ozs. of gold were recovered, the estimated value of which is £98,372. The total working costs were £69,348, or 20s. per ton, which left a profit for the quarter of £29,024, or 8s. 4.173d. per ton. Capital expenditure for the period was £14,243. On development work the west incline shaft was sunk 18 feet to 3,757 feet, or to 57 feet below the 21st level. The total footage accomplished was 1.279½ feet. Excluding main cross cuts or passes and prospecting work, 2,787½ feet, or 76.4 per cent. has been on reef of an average value of 5.7 dwts. over 48 inches. Of this 1.462½ feet or 52.5 per cent. has been payable of an average value of 9.5 dwts. over 48 inches. And 1.325 feet, or 47.5 per cent. has been unpayable of an average value of 1.7 dwts. over 48 inches. Of the payable portion 1,389½ feet or 95 per cent. has been on Main Reef Leader, averaging 9.7 dwts. over 48 inches. Of the payable portion 73 feet or 5 per cent. has been on South Reef, averaging 5.5 dwts. over 48 inches. The ore reserves are being adjusted for the year, and will appear in the annual report. At No. 3 shaft (seven compartment) 315 feet have been sunk and timbered, making a total depth to date of 1,762 feet.

THE FOUR MODDERFONTEINS.

Their Promise and Potentiality—What the Rand may Expect to Gain—Tonnages and Gold Contents Discussed.

THAT the more hopeful feeling prevailing in "Kaffirs" is largely the outcome of the Modder Deep Levels strike, and the excellent profit results secured by the New Modderfontein and the Modder B., seems unquestionable. But we feel sure that, were the full importance and significance of the intersection of a large ore body going nearly 9 dwts. per ton over more than 10 feet of gold-bearing rock considered in proper conjunction with the recent productive achievements of the mines situated to the north of the Modder Deep Levels, with the satisfactory development that has attended the exploitation of the Van Ryn Deep on the west and the Government Areas on the east and south, and with the excellent figures recorded by Brakpan and Geduld, both in regard to production and development, then an even more optimistic view of Rand affairs would be adopted, and rightly so. Years ago this journal predicted that the Further East Rand would, in time, prove something more than an adjunct of the more central Main Reef field. When the New Kleinfontein, New Modderfontein, and Van Ryn were the only three mines east of Boksburg producing gold (and each company was then operating on a comparatively meagre basis), we drew attention to the vast promise of the areas on Modderfontein, Geduld, Brakpan, and the other farms which constitute the Further East Witwatersrand. The most sanguine expectations held by the most hopeful optimists have been exceeded in the development of this Further East Rand area. Whereas in 1908 there were only 500 stamps at work to the east of Boksburg, and the profit earned by the three producing mines was under £700,000, the present rate of profit-earning is at the rate of, approximately, two millions per annum, and there are not less than 810 stamps and 30 tube mills employed. These figures will, of course, expand greatly during the next few years. It is here our particular purpose to discuss the vast possibilities of the four Modders—the New Modderfontein, the Modder B., the Modder Deep Levels, and the Modderfontein Government Areas—and to state, in brief statistical form, the claim areas and possible tonnages.

CLAIM AREAS, TONNAGES, ETC.

The sizes of these four propositions are as under:—

Government Areas	2,637
Modder Deep Levels	377
Modder B.	1,400
New Modder	1,271
Total	5,635

Assuming an average dip of about 11 degrees, one foot of ore throughout these four mines would represent well over thirty million tons. One cannot, of course, base calculations on such an exceptionally broad width of gold-bearing body as was disclosed in the Modder Deep Levels, but an average net stoping width of about 48 inches can apparently be assumed, and the probable tonnage existing in the "four Modders" may, therefore, be placed at well over one hundred and twenty million tons. If the productive results at present being secured by the Modder B. and New Modderfontein afford a criterion of the value to be derived from these tonnages, the net gross value of the four Modders in gold contents alone may be placed at about £250,000,000, and, even admitting that the Modder B. is at the present time working ore in excess of the average value of the ore reserves, the indicated gold contents of these properties are substantially over two hundred million pounds. The ore actually blocked out in the Modder B. at the end of last year amounted to 2,788,000 tons of an average assay value of 7 dwts., whilst in the New Modderfontein at the end of June last there were 3,341,830 tons developed of an average assay value of 7·6 dwts. There are thus in these two properties over six million tons of over seven dwts. ore blocked out, and this tonnage is, of course, rapidly being increased, not only in the Modder B. and New Modderfontein mines but by the work proceeding at the Government Areas and the Deep Levels in addition. In the Modderfontein Government Areas, or State Mines, rock drills are now employed, and development is accordingly being expedited. Simultaneously the deepening of the shaft and cutting of the station in the Modder Deep Levels is being hastened, and in both these mines there should soon be additional evidence as to reef conditions and values in this section of the Witwatersrand

THE FUTURE OF MODDERFONTEINS.

Exploitation of the Modderfontein mines has, on account of the peculiar reef conditions obtaining there, had to proceed on lines different from those adopted on the more central section of the Main Reef series. At some time in the future these vast properties will all be connected up, and it may be that some working arrangement will have to be arrived at in order to secure exhaustion of contents. But that is looking a good long way ahead. It is certain that before the Modderfontein mines terminate their existence as producers the Rand output will have been enriched by not less than £200,000,000, representing the total amount of gold won from the four Modderfonteins.

Nigel G.M. Co.

For the three months ended June 30, development at the Nigel was as follows:—Nigel Section.—No. 3 shaft was sunk 171 feet. Another level, the 22nd, has been begun 350 feet below the 21st level, and 32 feet have been driven. In order to push this drive as fast as possible the sinking of the shaft has been suspended. On the main shoot of ore stoping was carried on from the 8th to the 17th level, and on shoot No. 2, from the 17th to 20th level. Both shoots continue to give fair values. No sinking was done in No. 7 shaft, but a considerable footage was driven west and east in levels Nos. 13 and 19 respectively. In addition to the footage cut in the drives, a winze was sunk 19 feet below the 18th level east, which disclosed values equal to those found in the 19th level east. The 13 level west has now reached a point 3,050 feet from the shaft and should soon strike the big shoot from No. 10 shaft. In No. 10 shaft the only development done was in the 13th level north, where, during the month of June, the values averaged 16·2 dwts. over 24 inches. In No. 12 shaft the upraise from the 9th level south has been connected with the winze from the 7th level, and good values have been met with, up to 17·5 dwts. over 24 inches. This connection has opened the ground for stoping purposes as well as providing better ventilation. Rand Nigel Section.—Development has been pushed ahead in this section, the footage cut being 1,000 feet against 1,407 feet in the Nigel section. In A shaft, the 7th level east is expected to be nearing a shoot of ore, the top of which was cut in the 5th level. During the quarter C shaft has been connected with the stope below and will be enlarged to carry a regular sized two ton skip. D shaft has been sunk 73 feet and stoping carried on from the bottom of the prospect drive. The rock exposed is of slightly lower value, but the manager is satisfied the shoot will continue of a payable character. Development generally has been satisfactory, and the improvement reported for the previous quarter has been maintained. A dividend of 5 per cent. was declared payable to shareholders registered on June 30th, 1912.

GOLD IN THE RAND BANKET.

A Subject of Much Importance—Its Bearing on Prospecting Activity—The Theory of Infiltration from Diabase Dykes.

Some time has elapsed since Mr. C. Baring Horwood read his carefully prepared paper on the association of gold with iridosmine in the banket of the Rietfontein mine, and the conclusions to be drawn therefrom, before the Geological Society of South Africa. Little discussion appears to have taken place upon it, probably because the members of the Society agree with Mr. David Draper that it really doesn't matter. "Nor do I see how it will be admitted that a good deal depends upon the sources from which the gold has been derived," observed the latter, in a contribution to this journal the other day. "How will it help those companies, which are not turning out sufficient gold to pay their way, when they are let into the secret of the source from which the gold has been derived? Will their gold returns increase when they discover that the valuable metal they are seeking was put into the conglomerates by any particular process? And how will it help the prospector to find payable reefs?" This, in short, is the argument *cui bono*, and it is one that may explain the prevailing attitude of geologists to the more or less academic aspect of Rand geology. If it is really a sound one, it may be usefully applied to many other matters besides the consideration of the origin of the gold in the Rand bankets. It may be applied, for instance, to the careful and prolonged work which is being carried out by Dr. Mellor along the Lower Witwatersrand, and by the other field geologists in other parts of the Transvaal.

The Importance of Knowledge.

A knowledge of the origin of the gold in the Rand bankets would, probably, do none of the things that Mr. Draper apparently thinks it ought to do if it is to be regarded as worth troubling about. That is not a suggestion, however, which has been made in the *South African Mining Journal*. The statement which is referred to is as follows:—"It will be admitted that a good deal depends upon the sources from which the gold has been derived, and if it can be shown that there is nothing in the Main Reef series which justifies the claim of Mr. Draper, and those who support him, that it has been specially susceptible to enrichment, it follows, on geological grounds, that his indictment of other series is without adequate foundation." The statement seems plain enough. Let us endeavour, nevertheless, to make it more intelligible. If it can be shown that the Main Reef series has derived its gold contents from outside sources, and that the mineralising agencies have not been confined in their sphere of operations to that series, it follows that other large sections of "banket," in other parts of the Witwatersrand, may have been similarly favoured. If so, Mr. Draper's assertion that "all attempts to discover new lines of reef may be set aside as beyond the region of probabilities," can only be considered as insufficiently supported by facts. It can scarcely be doubted that the degree of uniformity exhibited by the Main Reef series in the matter of gold contents has been a hindrance to the exploitation of other gold-bearing conglomerates, which have not the same characteristics but which may prove equally profitable over extensive areas: If the gold in the Main Reef series, on the other hand, can be shown to be derived from exclusive sources, or to be merely a redistribution of gold which previously existed in the bankets of the series themselves, the inducement to continue the investigation of other reefs will not be very great, and the people who are spending money in the process may well be persuaded to put it to a better use. For this reason, the subject introduced for discussion by Mr. Baring Horwood, although, perhaps, indifferently elucidated by the particular evidence brought forward by him, is yet one which may be usefully considered. If there is reason to suppose that undiscovered ore bodies of importance still exist, by all means let further prospecting be encouraged.

The Leaching Theory.

Turning now to the evidence itself, it may be pointed out that the importance of dyke intrusions does not lie so much in the fact that the eruptive rock may, and generally does, no doubt, contain a certain proportion of gold, but that the physical results of the intrusion are material links in a chain of events which facilitate the deposition of gold in the adjacent rocks. "The big diabase dykes, which occur in almost all the mines of the Rand," says Mr. Horwood, "are abundant and sufficient evidence of former deep-seated communications with those channels whence the mineralising solutions may have ascended." When he goes further, and suggests that the gold and other metals in solution have been derived from the diabase itself, he enters upon very debateable ground. As a matter of fact, it has been demonstrated in a scholarly paper by Francis Church Lincoln, in *Economic Geology*, that the theory of the leaching of igneous rocks, in which even segregations of gold are extremely rare, is not tenable as an explanation of the contents of lodes or other auriferous deposits. "Kemp has shown," he remarks, "that the approximate amounts of concentration which these metals (iron, nickel, and chromium) must undergo to form ores are, respectively, 10, 250, and 4,000 into 1. Such concentrations applied to a magmatic content of 3½ cents. in gold per ton would produce rock assaying $0·35, $8·75, and $144·00 per ton. The two latter rocks would contribute gold ores. No such ores have been found. If there were any considerable bodies of igneous rock assaying 35 cents. per ton, some of them would almost certainly have produced placers of economic importance. The gold in the fabulously rich Klondyke district only represented a saving of about 2 cents. per ton of rock eroded. On these grounds, it would seem unsafe, in the present state of our knowledge, to assume any considerable magmatic "segregation of gold in igneous rocks." Kemp has shown that the leaching of compact subterranean masses of rock to form ores is a very difficult and improbable process, so that, unless the gold in them is first of all concentrated in some way or another, they may be disregarded as the sources of auriferous deposits. The conclusion is that the rocks which provide gold for lodes and similar occurrences are the open-textured clastic rocks which are easily leachable, and in which the gold has already been more or less concentrated in placer form. The function of dykes, whether of diabasic or other character, is obviously to facilitate the movement of the underground circulation—possibly to intensify it—after having first of all originated the fractures and other channels along which the circulating waters are conveyed. In the interesting little volume, *Types of Ore Deposits*, which was reviewed in this journal some time ago, Dr. Hatch, dealing with the conglomerates of the Witwatersrand, says:—"That gold has been precipitated in the banket at various periods of its long history is clear; on the other hand, there is no case on record of a nugget or of a grain or flake of gold being found which bore on its surface any signs of detrital origin, or in any way resembled alluvial gold." If this be so, is it likely that the Main Reef series has been exclusively enriched within the limits of profitable mining? It is surely worth while to enquire further.

THE TIN MARKET.

Fluctuations in Prices—A Fundamentally Sound Position—High Prices fail to Stimulate Increased Production.

The price of tin is obviously a matter of prime consideration to producers of the ore in this country, as elsewhere, and it is not difficult to understand that an appreciable rise in market quotations may be marked by an equally appreciable increase in the profits available for dividends. It would not be unlikely, also, to revive that interest in the Waterberg tin fields which has recently appeared to be somewhat on the wane. In the beginning of the year, when January dates were selling from £188·10 to £190·10, it was anticipated that a continuance of high prices would be experienced during the coming year. There was little change to be expected in the volume of production unless the prevalence of attractive prices proved an inducement to Bolivia and the Federated Malay States to make a special effort and do something unusually brilliant in the way of production. Since then the market has advanced, and as high as £207·10 was registered in the earlier part of June. Latterly things have vacillated at a lower level, and the latest mail reports show that the metal suffered largely about the middle of July, in sympathy with copper, little business being transacted. On Friday, July 19th, Messrs. Henry R. Morton and Co., Ltd., reported, with regard to tin, that:—This market was subject to some violent fluctuations, not only in response to an ever-varying change in sentiment, but also because of the rather restricted dealings and the absence of leadership. The East was at no time conspicuous as a seller, and at first prices hardened on some consumptive buying and a little speculative demand; cash advanced to £201 10s., and three months to £197 10s., but when the demand was satisfied the bear element secured control of the market, and, by selling not only forward delivery, but also spot metal rather freely, succeeded in disheartening some stale holders, who anxiously liquidated their positions. A good many options at around £200 falling due this week were abandoned, which led to further precipitate selling by dealers left with stock, and caused a drop in price to £195 10s. cash, £194 three months. This level attracted good buying, which rather disturbed the bears, who had assisted the decline by offering aggressively, and who quickly altered their tactics. A smart recovery resulted, and up to £199 15s. was paid for early dates, and £197 10s. for three months. We finish easier at £198 10s. spot, £196 three months. "There is again some enquiry from America, but bids are generally below the market value. As soon as buying from that quarter is resumed, we expect an advance in prices, as the market is now fairly well sold with the metal in stronger hands, and a moderate bear account in existence."

It is clear that the bear position was none too strong at the date of the report just quoted, and with more settled industrial conditions, and the disappearance of excitement from the copper market, the fact that production is not increasing, and that demand is not diminishing in the tinplate trade, is bound to assert itself at no distant date. The dock strike was the cause of supplies of metal being held in London which were badly needed in America, and it was stated that fancy prices were being paid for spot stuff across the Atlantic in the middle of June. When the adjustment of this demand takes place, and labour disputes are no longer an obstacle to the ordinary working of the laws of supply and demand, it may be expected that the obvious inability of the Straits and Bolivia to do anything unusually brilliant at present will tend to elevate prices still higher than the highest so far reached. There is little doubt, as the *Mining Journal* observed a couple of months ago, that, fundamentally, tin is in a strong position.

PRODUCTION IN THE STRAITS.

With regard to the Straits production, it is interesting to note that the figures for the last four years have been, in pikuls:—1908, 854,064; 1909, 818,887; 1910, 736,898; and 1911, 741,698; one ton of 2,240 lbs. being equal to 16·8 pikuls. For the first five months of 1912 the total yield has been 321,111 pikuls, a rate of production which is not indicative of any material improvement upon last year. In a widely circulated statement, made about November, 1911, Messrs. Bergmann wrote:—"The production in the Straits Settlements has for some time reached its maximum capacity. In spite of the fact that in the well-established refineries at Singapore and Penang, for quite some time, large quantities of ores from other fields of production have been treated, the figures of shipments are steadily decreasing." In connection with this statement, it may be added that the Straits shipments in 1908 were 62,688 tons, and that they decreased to 57,049 tons in 1911. For the first six months of this year the shipments amounted to 29,283 tons, and this figure, again, corroborates the opinion suggested by the other figures just given, that in spite of the temptation of high prices the Straits are unable to rise to their opportunity. It is difficult to ascertain what the periodical tin production of Bolivia actually is. No one, apparently, except the official Customs staff is really in a position to throw any useful light upon the subject. The imports to the United Kingdom, however, may be taken as some indication of the progress made, and we find that for the first five months of 1912 there were received 6,367 tons, as against 6,488 tons for the corresponding period of 1911. The opinion generally expressed at the beginning of this year was that Bolivia was doing quite as much as she could well manage until the railways enable new properties to be opened up. For the information of those who wish to know the Customs returns of Bolivia for, say, the last five years, we may state that they were, in metric terms:—1907, 16,601; 1908, 17,963; 1909, 21,340; 1910, 23,129; 1911, 22,200. Here again the inducement of high prices has failed to obtain a satisfactory response.

Union Steel Works.

Mr. Scoby Smith, the general manager of the Union Steel Corporation, has arrived with five foremen at Vereeniging, where he will immediately start on the works.

Labour Position for July.

The following labour figures for July are compiled and furnished by the Chamber of Mines:—Number of natives employed at the end of last month by members of the W.N.L.A. and contractors: On gold mines, 182,925; on coal mines, 8,497; on diamond mines, 15,834; total, 207,256.

Bloemhof Diggings.

At Bloemhof a syndicate is engaged in building breakwaters on the river. Good reports are still coming in from Mooifontein No. 3, and good things are reported from Schweizer-Reneke, though most old diggers regard the prospects of this latter place in the light of an ordinary "lucky patch." Avondster is the next farm to be proclaimed as a public digging. The field adjoins that of Mooifontein, and a certain part of it, which has been tested and proved, is regarded most favourably by Mooifontein diggers, but this part is the north-western portion of the farm, and is not going to be proclaimed.

DISASTROUS FIRE AT THE KNIGHTS DEEP.

Crusher Station Burned Down—Some Features of the New Plant—A Week's Run Lost.

The Consolidated Gold Fields of South Africa have experienced a piece of bad luck in having the joint Knights Deep-Simmer and Jack East crusher station burned down. This is the first serious fire that has occurred along the Main Reef for some time, and, although it was commendably dealt with by the Germiston Fire Brigade and the employees, the station has been completely destroyed.

SPEEDY DESTRUCTION.

About six o'clock on Monday morning the fire was discovered, and it was immediately evident that the flames had gained a firm hold of the woodwork and machinery. The Germiston Fire Brigade was promptly summoned, and in the meantime the employees, led by the manager, Mr. G. A. Chalkley, fought the fire admirably. Aided greatly by a good pressure of water, they did excellent work, and when the Fire Brigade, headed by the Chief Officer, Mr. Thiel, arrived within five minutes of the raising of the alarm, the flames seemed, to some extent, to have been got under control. It was obvious, however, from the first that the crusher station would be lost, and all efforts were accordingly concentrated on preventing the fire from spreading. At one time the joint Knights Deep-Simmer East 400-stamp mill was threatened, and the destruction of this would, of course, have been an exceedingly serious matter indeed. Happily, the catastrophe was averted. The fire was well in hand about eight o'clock, but by that time all that remained of the structure was a heap of charred wood and twisted machinery. The chief officer of the Brigade did not consider it safe to withdraw his men until late in the day. When the blaze was at its height offers of assistance came from the Johannesburg and Boksburg brigades, and also from the East Rand Proprietary Mines. But it was then clear that help could be of little avail. The fire completed its work of destruction in about one hour. The origin of the catastrophe is a mystery. It is conjectured that a spark from the electrical plant started the blaze going, but this, of course, is a mere surmise. The oil employed for lubricating the crushers, naturally, made the station burn more quickly than would have been the case in an ordinary building, and at one time the heat was terrific, and the flames aroused attention right along the East Rand. The fire was the largest that the Germiston brigade has had to deal with for a long time past, and the members answered the summons very speedily. The mine staff and employees worked like Trojans, but they had no chance of saving the building or machinery; in fact, they were lucky in being able to save the reduction works.

THE NEW STATION VIRTUALLY COMPLETED.

In another direction the Knights Deep-Simmer East management are fortunate, inasmuch as construction of a new crusher station was commenced some little while ago, and was due to commence work in about one month from the date of the accident. The erection of this new crusher station is now being pushed on with all possible despatch. Three shifts are at work, and construction is proceeding night and day. So rapidly has work progressed that it is expected the new station will be ready for work on Monday. The mine is being cleaned up, and such fines as are available are being milled, but, in consequence of this catastrophe, it is expected that the Knights Deep and Simmer East will lose a week out of the month's run. In July the Knights Deep operated 270 stamps and six tube mills, crushed 62,200 tons, declared an output of 12,534 ozs. of fine gold, and announced a total profit of £17,505. The Simmer and Jack East, with 130 stamps and three tube mills at work, crushed 34,000 tons, declared an output of 7,823 ozs., and made a profit of £6,997. At each mine, therefore, it looks as of the tonnage and thus the output for August will be reduced by a quarter, whilst the profits will, in all probability, be affected to an even greater degree. In September. however, there should be a return to normal conditions.

EFFICIENCY OF THE NEW EQUIPMENT.

The new Knights Deep crusher station is of most modern design, and will easily rank amongst the leading and most efficient structures of its kind on the Witwatersrand. There will be four sets of jaw breakers—three breakers in each set. One breaker, for dealing with the ore coming from the mine, will reduce the ore for the two other breakers, which will be placed below the primary crusher, and these two latter breakers will further reduce the rock to the size required for entry into the mortar boxes. Between the primary and secondary machines a grizzley is interposed, and it is believed that the new stage breaking plant of the Knights Deep will do at least as efficient work as any other station on the Witwatersrand. The position at the Simmer East in regard to future sorting arrangements is a rather indefinite one at present. The Simmer and Jack East Company is in liquidation, and it would probably take five months or more to erect a substantial crushing station for this property. Meanwhile, the new Knights Deep station will be utilised to crush ore from the Simmer East as well as the Knights Deep, and at an early date some decision as to the future policy to be adopted with regard to the Simmer East will be arrived at. Neither the Knights Deep nor the Simmer East reject much waste rock, the ore coming from the mine, and especially from the large stopes of the Knights Deep, being fairly clean. In May of this year the Knights Deep Company sorted out 8 per cent. of the ore hoisted, and the Simmer East discarded 3 per cent. Whilst one sympathises with the Gold Fields Company in this serious loss at a time when the Knights Deep was recording such consistently good results, one cannot but congratulate the management on having had the new crusher station in such an advanced state of construction when the fire broke out. The original Knights Deep crusher station cost about £54,000.

Witwatersrand Deep.

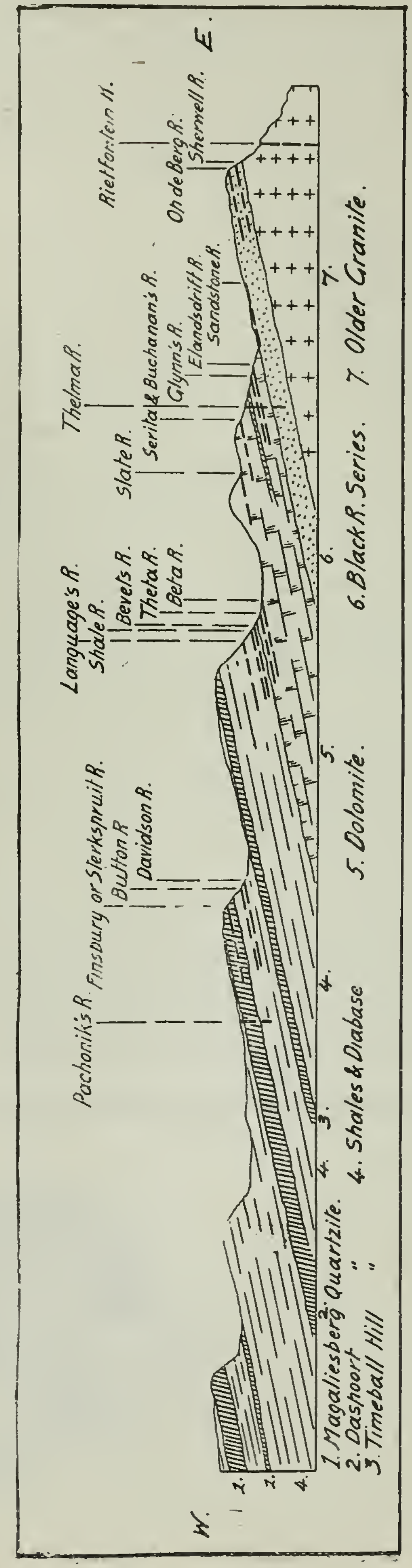
The report on operations for the quarter ended the 30th of June at the Witwatersrand Deep states that from 111,750 tons milled, 37,625.77 ozs. of gold were recovered, the revenue from which was £157,662. Working expenses absorbed £106,892 or 19s. 1.57d. per ton, which left a profit for the quarter of £50,770 or 9s. 1.03d per ton. The capital expenditure for the period was £10,221. The east shaft has been sunk 17.5 feet, to a total 2,878 feet. The auxiliary shaft has been sunk 91.5 feet, to a total of 1,030 feet. On development work, total footage for the quarter was 2,829 feet. Of the total development 2,394 feet or 84.62 per cent. has been on reef. Altogether 2,113 feet have been sampled, the average value being 9 dwts. over 49.70 inches. This total comprisés 1,708 feet, or 80.83 per cent. over averaging 9.13 dwts. over 56.07 inches and 405 feet or 19.17 per cent., averaging 4.72 dwts. over 22.86 inches. The payable ore exposed at the 31st March was 1,371,956 tons at 6.78 dwts. over 48.88 ins. Payable ore developed during the quarter ended the 30th June, 1912, 81,767 tons at 8.35 dwts. over 48 ins. making a total of 1,453,723 tons at 6.87 dwts. over 48.83 ins. Less ore from payable blocks during quarter ended 30th June, 84,543 tons. Total ore reserves, 30th June, 1,369,180 tons. The water has completely drained away from the 14th and 15th levels and on the 16th level has decreased to about 790,000 gallons per day, but there has been a corresponding increase on the 17th and 18th levels. The amount of water pumped for the quarter was 206,522,655 gallons and cost £7,227 to pump, equal to 1s. 3.52d. per ton milled. The cross-cut on the 15th level has intersected the reef and 310 feet of driving to the east has been done on reef, averaging 8.8 dwts. over 55.8 inches. It is expected to be able to start development on the 16th level during July.

PROGRESS OF THE LYDENBURG DISTRICT.

An Attractive Area—Small Workers Increasingly Active—Gratifying Returns From Graskop and Ledophine.

The accompanying diagrammatic sketch is intended to show the succession of reefs in the Lydenburg district, where, as we have pointed out at various times recently, prospecting and mining activity is on the increase. The output from all sources for the month of June, 1912, was 13,434·886 ounces fine gold, valued at £57,067, while the number of men employed in the work was 359 whites and 5,192 coloured. The more important mineralized horizons and the principal reefs are indicated in the section, the most famous of all being, of course, the Theta reef in the dolomite, which, together with Glynn's Reef, nearer the base of that series, has proved persistent and profitable for many years, and has furnished and continues to supply the greater part of the output of the district. The reefs, it will be observed, are to be divided roughly into two groups; first, those which run more or less conformably with the strata of the three series into which the Transvaal System is divided, and secondly, a less important group which strikes across the formation, and are known as "cross reefs." Some time ago we published a map showing claim holdings on Graskop, among them those of the Pilgrims Creek Syndicate (late Graskop Theta). It is reported that this syndicate has been getting very good results from a lower, recently discovered, new reef, and also from the Theta Reef above their battery, which together with a cyanide plant should now be pretty well in running order. On the Desire claims, immediately adjacent on the west, Messrs. Haskell and De Beer are said to have been obtaining 15 dwt. rock from the Theta reef. On the Jubilee block Mr. W. P. Taylor carries on extensive exploration works, under the supervision of Mr. J. Thorburn. The adjoining little Octopus mine is erecting a 65 h.p. suction gas plant, and intends to add more stamps and complete their slimes plant. Their recovery has been well over 10 dwts. Messrs. Burnham and Munro still hold the record for recovery of gold in this district with a small plant of five stamps from their claims on the ridge of the Graskop. On Mac Mac, recently acquired by some Oudtshoorn people, the recovery from battery and sand plant has been very satisfactory. Good results are being shown on the mynpacht of Ledophine 457, held by Capt. Cornwall and Messrs. Burnham and Munro, of Pilgrim's Rest. A year's development has resulted in exposing ore to the extent of 15,000 tons, stated to go no less than 35 dwts. This is on the vertical reef, whilst in Glynn's Reef 30,000 tons, with a reported value of about 15 dwts., have also been opened up. The owners contemplate the erection of machinery and plant, and have been negotiating with the Government to obtain a connection with the main power line of the T.G.M.E.

The ordinary general meeting of the Chemical, Metallurgical and Mining Society will be held this evening at the School of Mines, the agenda including the following: Mining Papers.—For reading: "So-called Air Blasts, and Roof Pressures," by Mr. Tom Johnson. For discussion: "Notes on Dust Determination by Filtration through Sugar," by Mr. A. McA. Johnston; "A New Apparatus for Sampling Air for Dust," by Mr. E. J. Laschinger; "A System of Keeping Underground Costs and Records," by G. Hildick Smith; "Mine Tributing in Rhodesia," by Mr. W. Anderson. Metallurgical Papers.—For reading: "Minor Improvements in Cyanide Practice," by Mr. Percy T. Morrisby; "Investigation on Magnetically Separated Iron from Mill Pulp," by Mr. A. McA. Johnston. For discussion: "The Surface Workers on the Rand and their Technical Education," by Mr. F. J. Pooler; "Notes on the Cyaniding of Concentrates," by Mr. Robert Linton. Chemical Papers.—Reply to discussion: "The Luminator Purification Treatment of Water for Steam Boilers," by Mr. William Cullen. Final discussion: "The Action of Mineral Sulphates and Arsenates on Cyanide Solutions," by Mr. Andrew F. Crosse. Papers awaiting replies to discussion: "Some Observations on Ancient Mine Workings in the Transvaal," by Mr. T. G. Trevor, A.R.S.M., Acting Inspector of Mines, Pretoria; "Zinc Dust Tests," by Dr. W. J. Sharwood.



Diagrammatic Section across Central Lydenburg, showing Principal Reef Horizons.

THE HARDINGE MILL AT THE VILLAGE DEEP.

An Efficient Machine for a Fine Product Only—Mr. Hardinge's Views.

It has often been prophesied that the stamp battery will eventually be ousted from its position of supremacy amongst the list of ore reducing devices that have been adopted or experimented with on the Witwatersrand. But there are as yet no signs of the heavy, costly, and admittedly clumsy gravitation stamp going out of favour. On the contrary, it would appear that its precise functions are more keenly appreciated to-day than at any other time in the history of the Transvaal gold mining industry.

Supremacy of the Stamp Battery.

It is significant that of the numerous brand new ore-crushing equipments that have been erected on the Rand during the past three years not one has yet replaced the gravitation stamp. It may be clumsy, costly and cumbersome, but it is a proved mechanism, and instead of research in the direction of ousting the stamp battery from its domineering position in the metallurgy of the auriferous conglomerates, efforts have been directed on making it more costly, more cumbersome, and withal more efficient. We would here remark that in using the word costly, we apply the term to initial expenditure and not to running charges. For it is just here, in the matter of expense and operation, that the gravitation stamp mill has, presumably, demonstrated its superiority on the Rand over all other types of primary ore reducing appliances. True, its functions have altered of recent years. The stamp battery is to-day an intermediary between the rock breakers and the tube mills, rather than the sole corollary of the breakers. But this intermediary is of such vast and essential importance in the metallurgical scheme, and has done its work so well for so many years, that few practical reduction works officers on these fields seriously would entertain the idea of a substitute. The tube mill has proved a most valuable adjunct of the gravitation stamp battery, and the battery has been adapted to the needs and necessities of the fine grinding policy—"the new metallurgy," as it used to be termed—in a manner which compels admiration for those who have developed metallurgy on these fields to its present high pitch of excellence, and also compels admiration for the adaptability of the Californian stamp to the new conditions.

We introduce our few and brief remarks on the Hardinge Mill and the results obtained from it at the Village Deep with the foregoing preface, because it seems to us, from a letter received from the Hardinge Conical Mill Company of New York that Mr. H. W. Hardinge advocates the substitution of a ball mill for the stamp battery, since a portion of his letter reads as follows:—"The idea of always using the heavy stamp shown upon the large particle indicated, also the same size stamp upon the smaller particle, is radically wrong. Because the stamp has been so long used is really no reason why it should continue to be used as a fine crusher. The principle of using coarse rolls for coarse crushing, and finer rolls for fine crushing, is a right mechanical principle, but it should not be considered that the principle of a heavy stamp upon the same size of material is correct simply because there has been no means or method of mechanically varying the size of stamps to the size of ore undergoing reduction. The ball mill is, in the opinion of the writer, a better principle of crushing than the stamp." In another communication he writes:—"It is the professional belief of the writer that, while the stamp will continue in existence as an effective crusher of ore, a simpler principle of crushing as effected through the ball mill, whether it is of the Hardinge type or some other, is still to be worked out."

Village Deep Results.

An 8 ft. Hardinge mill has been tested by the Metallurgical Department of the Central Mining and Investment Company at the Village Deep for some months past. The mill has been proved to give efficient results on a fine product, but we understand that it has not given satisfaction with coarse particles of ore. With 100-mesh screening the mill has done good work, but for ore passing through the coarser mesh used in the Village Deep battery the Hardinge mill has, we believe, compared unfavourably with the ordinary cylindrical tube mills. Since coarse crushing in the mortar boxes, and subsequent fine grinding in tube mills, is the approved practice on the Rand to-day, it would seem that the best conditions under which the Hardinge Conical Mill works are contrary to those which are believed to give the best results on the Rand to-day. The Hardinge mill experimented with at the Village Deep has been purchased by that company, and now forms part of the permanent equipment. We regret that we are unable at present to give full details of the test, but hope to be able to do so in the near future.

Vira Mine.

The installation of the Lane Slow-speed Chilian Mill at the Vira Mine is said to have resulted in a thoroughly satisfactory recovery. The talcose character of the ore is rather a hindrance to the ordinary crushing and amalgamating methods, whereas the fine grinding combined with amalgamation which is carried out in the pan appears capable of dealing with schistose ores very readily.

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VICTORIA FALLS AND TRANSVAAL POWER.

A Prosperous Year—The Marquis of Winchester Spends Two Months in Africa on the Company's Business.

The total share and debenture capital of the Victoria Falls Company issued stands at £7,000,000 The year's business has resulted in a profit of £323,093, which, with the balance at the credit of the profit and loss account as at December 31, 1910, remaining after payment of the dividend declared at the last general meeting, makes a gross total of £360,943. After providing for interest on debentures and income tax thereon for the year 1911, amounting to £124,736, and for depreciation amounting to £61,264, the balance remaining is £174,943, as shown in the balance sheet. In respect of this balance, the directors declared a dividend at the rate of 6 per cent. per annum, paid on June 14, 1912, which absorbed £129,198, leaving £45,744 to be carried forward. The profit shown in the accounts has been secured by sales of power from the Brakpan and Simmer Pan stations, and from profits received in respect of the company's holding in the Rand Mines Power Supply Company. The directors report " a period of sustained progress during the year 1911 and down to the present time." The results obtained from all the stations continue to give entire satisfaction, and now show an increase in profits month by month. The erection of the two companies' power stations have practically guaranteed a regular supply of power to the Rand mining industry at a very reasonable price, with the result that the companies have received demands for an increased supply of power from consumers, who are entitled, under long-term contracts, to be supplied with the power they require. The company has received applications for power supplies amounting to 52,000 h.p. and the Rand Mines Power Supply Co. for supplies of electricity of 67,000 h.p. and of compressed air of 66,000 h.p., making a total notified demand of 185,000 h.p. When all the extensions to the stations for which arrangements have been made are completed the combined plants of the two concerns will have a capacity of 232,000 h.p. During the year under review the chairman paid a visit to South Africa, where he was engaged for two months in Johannesburg on the business of the company.

THE AFRICAN AND EUROPEAN INVESTMENT CO.

Progress of the Vereeniging Estates—The Company's Land Holdings—Improving Outlook.

The ordinary general meeting of the African and European Investment Company, Ltd., was held in mail week. Mr. C. F. Rowsell presiding. The Manager and Secretary (Mr. A. D. Owen) read the notice convening the meeting and the report of the auditors.

THE VEREENIGING ESTATES.

The Chairman, in moving the adoption of the report and accounts, reminded the shareholders that this was the first meeting of the African and European Investment Company held in London, previous meetings having been held in Johannesburg. He proceeded :—Before turning to the main asset of your company—its land holding—I should like to deal with the interest of your company in the Vereeniging Estates. This company, as you may be aware, has an issued capital of £730,580 and a debenture issue of £350,000, which latter, as I have before mentioned, is now entirely held by your company. The Vereeniging Estates property consists of 126,230 acres of freehold land, situate in what is practically a compact block on either side of the Vaal River. It owns virtually the whole of the township of Vereeniging, while nearly all its land is situated on a great coalfield. At the present moment the company is operating a coal mine, from which over 25,000 tons of coal per month is being produced; and it is intended—within the next few months, we hope—to increase this to from 30,000-40,000 tons of coal per month. A great change has come over the estate within the last two or three years. The board of the Vereeniging Estates, Ltd., may well claim to have very largely forwarded the scheme for the provision of electric energy in bulk to the Witwatersrand, and if it had not been for the fact that they were able to make advantageous arrangements with the Victoria Falls and Transvaal Power Company, Ltd., it was fully their intention to proceed with a power scheme on a large scale at Vereeniging on their own account. However, the big organisation known as the Victoria Falls and Transvaal Power Company, Ltd., was formed under influential auspices; and, after a great deal of negotiation, terms which were considreed satisfactory to the Vereeniging Estates were concluded—in pursuance of which a large power station, capable of an output of approximately 60,000 h.p. is now practically completed at Vereeniging, and will commence operations within the next two months. One of the terms of the contract entered into by the Vereeniging Estates with the Victoria Falls and Transvaal Power Company was that all coal required for the generating station at Vereeniging should be supplied by the Estates Company upon terms which guaranteed the latter a fixed profit of 1s. per ton. The Estates Company have now received notice of the preliminary requirements of the Power Company, which will apparently exceed 300,000 tons per annum—this, of course, being in addition to the other demand which in the past has kept the collieries of the Estates Company well supplied with orders. From this source alone, therefore, you will see that the Estates Company has an assured income which in itself is sufficient to practically guarantee the interest on the whole of its debentures. The erection of this power station has had other and even more important consequences for the Vereeniging Estates. Already other industries are being attracted by the unique facilities afforded by Vereeniging in the shape of cheap power, coal, land and building materials, and an ample water supply secured by the big dam which has here been thrown across the Vaal River.

THE OUTLOOK FOR COAL.

The Union Steel Corporation (of South Africa), Limited—an important and influential company—has taken a site near to the power station, upon which an up-to-date foundry for the manufacture of iron and steel to meet the increasing demands of the mines of the Rand will within the next few months be in course of erection. Every new industry attracted to Vereeniging not only means a new outlet for our coal supply, but also an increased population—all of which, owing to the wide area owned by the company, must be located upon their property; and, as is a matter of common knowledge, a greater population means a rapidly increasing demand for all the necessities of life, and therefore a rapidly increasing trade and steady development in the districts surrounding these great works. The Estates Company is also making great progress in agriculture and cattle and sheep farming, and good profits may be looked for in all these directions. The trees in the valuable and extensive forests at Maccauvlei are also rapidly approaching maturity, and considerable revenue should be derived from this source before long. I may mention *en passant* that the management of the Vereeniging Estates is now in the hands of Mr. Isaac Hodges, a colliery engineer of the very highest reputation for management and organisation. Mr. Hodges resides at Vereeniging, and under his personal and close supervision we have every confidence that the development of the collieries of the Vereeniging Estates will proceed on the most modern and approved lines. Naturally, however, the great advantages to which I have referred above have not been secured without considerable capital outlay: and it is to meet these demands that the proceeds of the £350,000 debentures have been applied. One of the terms of the arrangement with the Victoria Falls and Transvaal Power Company, Limited, was that the Vereeniging Estates should become a large shareholder in that company; and, in pursuance of this arrangement, 150,000 preference shares of that company were taken up by the Vereeniging Estates, which also owns 20,000 of their ordinary shares. We look upon this large holding in the Victoria Falls and Transvaal Power Company as of very great value. The preference shares are cumulative, bear interest at 6 per cent. per annum, and participate in surplus profits up to 10 per cent. As the profits of the company already range well over £30,000 per month, and only a portion of the plant has been commissioned as yet, you can well see that we are interested in a very great and progressive business; and I personally see very little reason to doubt that before many years are past the full 10 per cent. on the preference shares may very well be earned. Before closing my remarks with regard to the Vereeniging Estates I might mention that a few weeks ago I saw a letter from a gentleman of great experience who has recently revisted the estates after two years' absence. In this he states that the improvements manifest everywhere in the appearance of Vereeniging are of a most remarkable and encouraging character.

LAND HOLDINGS.

I will now turn, gentlemen, to what I consider your greatest asset—namely, your land. I would, in the first instance, remind you that the total acreage which your company owns is equivalent to 1,270,183 English acres, of which approximately 250,180 English acres are situated in British Bechuanaland, the majority of it being in one large block on the southern bank of the Molopo River. These farms, as you will have been informed, are actually owned by the Bechuanaland Farms, Limited—all the shares of this subsidiary company, however, belonging to your company. In the earlier days of land companies, the principal attraction when purchasing shares of this description lay in the possibility of finding payable minerals on one or other of the widely dispersed farms owned, as naturally even only one such discovery might well be of a value equal to the whole capitalisation of the company itself. That these possibilities still remain to-day is, I think, well instanced in our own case by the Roberts Victor Diamond Mine, which was discovered upon property adjoining one of your company's farms; and there is no reason why we should not continue to attach great importance to our mineral possibilities At the same time, we must not overlook the fact that a complete and far-reaching change has occurred with regard to land in the Transvaal, regarding it purely from the agricultural point of view; and I cannot help thinking that the European investor is inclined to overlook the immense progress which is now going on.

The Chairman went on to refer to statistics in illustration of the agricultural progress of South Africa, together with high prices realised of late for land in the Transvaal. He also pointed out that while stock diseases are being eradicated, water boring and the science of dry farming is making valuable land which was once considered almost valueless. He continued: These improved conditions, I am pleased to be able to tell you, are already being reflected in the case of your own property. As you will see from the report, we have entered upon a more active policy in connection with the improvement of our lands, and already we are securing a better class of tenant for our farms and are obtaining an increasing revenue from them. At the same time it is obvious that before the land companies can expect to fully benefit by the great improvement which is taking place, the general spread of prosperity amongst the owning and the working farmers must have reached a point when it will attract newcomers to the Transvaal. That this condition of affairs is now arising is perfectly clear, and I feel confident that year after year I shall have the pleasure of placing before you particulars of a more and more satisfactory revenue derived from our extensive land holdings. Now, gentlemen, I have dealt rather fully with this side of your company's assets, because I am convinced, as I have already said, that for some reason or other the extraordinary improvement which is going on in the agricultural development of the Transvaal has not yet reached the minds of the bulk of the people on this side, and I think if you will carefully consider the facts which I have placed before you to-day you will have no hesitation in setting upon the great land holdings of this company a value certainly far above the figure at which they at present stand in the books.

MINING INTERESTS.

As you are aware, our principal interest in this country is through our large shareholding in the Rhodesia Gold Mining and Investment Company. We have not been able to turn this asset to any great account during the past year, because, as you know, market conditions have been by no means favourable. The intrinsic value of our holding, however, is quite satisfactory. As you are aware, the Rhodesia Gold Mining and Investment Company has very large interests in the Lonely Reef Gold Mining Company and in the Cam and Motor Gold Mining Company, in addition to the Sabi mine and other very promising mining ventures. As you know, we are large shareholders in the East Rand Mining Estates, Limited, and the East Rand Extension Gold Mining Co., Limited. Those who closely follow mining news will be aware that developments in the neighbourhood of these two properties have recently been of a highly satisfactory character; and your Board trust that, with improving conditions, it may be possible before long to turn these interests of ours to very profitable account. Mr. J. B. Hilliard seconded the motion, which was carried. The Chairman proposed the re-election of the retiring directors (Messrs. H. W. Smart, S. Marks and A. C. Mallinson). Mr. Julius Weil seconded the resolution, which was unanimously adopted.

ROOIBERG PROGRESS.

The New Plant Showing Results—Materially Increased Recovery—Development Expenditure Transferred to Working Costs.

THE effect of the new 10-stamp mill and dressing works which have been in working order for the last two months, and have, as we remarked a little time ago, been started up practically without a hitch, is being distinctly marked in the matter of the output. For the month of July the particulars are as follows:— Stamps, 10; days run, 28·376; tons milled, 3,007 short tons; concentrates milled, 95 long tons; average assay value metallic tin, 67·12 per cent.; estimated profit, £4,411 11s. 2d.; adjustments due to fluctuations in the price of tin to be deducted from estimated profit in respect of March shipments, £106 13s. 11d.; net profit for month, £4,304 17s. 3d. The concentrates in reserve at the 31st July, 1912, amounted to 17·33 tons (2,240lbs.) of the net value of £1,616. From 1st July all expenditure on shaft sinking, exploration and development is included in working costs and such expenditure for July amounted to £2,758. Tonnage milled includes 1,161 tons sands treated. The following comparative statement shows the progress of the company during the past two years, ended June 30th in each year:—

Tons of 2,000lbs. Ore Treated; 2,240lbs. Concentrates.

	Ore Treated Tons.	Yield of Concentrates Tons.	Assay Value. %	Estimated Profit.
Year to June 30, 1911 ...	17,781	961¾	67	£55,116
1911-12.				
September quarter ...	4,637	210¾	—	13,953
December quarter ...	4,687	196	67	10,903
March quarter	4,648	182	69	9,505
April	1,540	58	70	3,211
May	1,828	72	68	4,270
June	3,459	84	67	4,325
Twelve months	20,799	802¾	—	46,197
July	3,007	95	67·12	4,305

The new plant, it may be remarked, is probably running well below the capacity of the 10 stamps, and, as will be seen from the statement given above, more than a third of the tonnage treated is comprised of old sands, which are being re-treated. In spite of the fact that former capital expenditure under several heads mentioned was included under the head of working costs during July, the profit for the month was about £4,305.

Mr. Julius Jeppe has been elected vice-president of the Transvaal Chamber of Mines, in the place of Mr. M. G. Elkan, elected president.

* * * *

Mr. L. Marks has been appointed to the vacancy on the Executive of the Transvaal Chamber of Mines, caused by the resignation of Mr. C. W. Villiers.

On August 1 the Reuter South African Press Agency was authorised to publish an official statement regarding the recruitment of natives in British South Africa for employment on the mines of the Rand, with the object of removing the undue competition existing in procuring native labourers, which statement had appeared in our columns some weeks previously.

POSITION OF THE TRANSVAAL GOLD MINING ESTATES.

Satisfactory Development—Ore Reserves Maintained—Increasing the Crushing Capacity—"Infinite Possibilities of Company's 300 Square Miles of Property."

A SPECIAL general meeting of members of the Transvaal Gold Mining Estates, Ltd., whose addresses are elsewhere than in South Africa, was held in mail week in London, Mr. Charles Pakeman presiding. The chairman stated that Mr. Nicol Brown was unfortunately unable to be present, owing to illness, and he was sure all present would join in wishing him a speedy recovery. Proceeding to refer to the results of the past year's working, he said: The yield of gold and the working profit show an increase over the figures of the previous year, though the dividends paid during the year show a decrease of 2½ per cent., or 6d. per share. The total profit amounted to £205,103 (against £204,861 the previous year), and, adding £60,118 brought forward and other small items, there was a disposable balance of £265,114. Of this amount £18,582 was payable as profit tax to Government, £166,165 was distributed in dividends, and £80,666 carried forward. The increase in the gold produced amounted to 1,697 ozs. To obtain this it was necessary to crush 22,331 tons of ore more than during the previous year. Expressed differently, we had a decrease of, roughly, 2 dwts. (from just over 14½ dwts. to just over 12½ dwts.) per ton crushed. This falling off is accounted for chiefly through our crushing more Clewer ore than formerly. The working expenditure per ton was the lowest ever reached by the company, being 3s. 0½d. per ton less than that of the previous year, and 1½d. per ton less than that of the year ended March 31, 1910, which was the lowest previously recorded. We have a larger aggregate profit with a smaller profit per ton, accounted for by the large proportion of Clewer ore dealt with. As the general manager says in his report:—"The working profit at the Central mines shows a decrease of 6s. 8½d. per ton compared with the previous financial year. This was due to the necessity of milling as speedily as possible the low grade ore in the Clewer mine. Owing to the material increase in the tonnage treated, however, the actual decrease in profits only amounted to £5,677. This decrease was more than counterbalanced by the improved profits at Elandsdrift and Vaalhoek, so that the company's working profit shows an increase of £2,608 for the year." The results at Elandsdrift have been most satisfactory. A few more tons were crushed; the yield improved from 7,643 ozs. to 9,417 ozs., or from 19¾ dwts. to 23¾ dwts. per ton; and although there was an increase in the working costs the total profit rose by £5,570, or 12s. 7d. per ton crushed. Furthermore, the ore reserves have been increased from 23,390 tons to 26,013 tons, an improvement of 2,623 tons. At the Vaalhoek mine, again, we find an improvement in the year's productive operations, the profit having risen from £2,632 to £5,348. The ore reserves, however, show a decrease, but our general manager is not without hopes of an improvement in his mine in the near future. Although the profits were slightly higher than those earned during the previous year the dividends were one of 15 per cent. and one of 12½ per cent., against two of 15 per cent., and entailed the distribution of £15,105 less. As a result our cash and cash assets, representing the balance of unappropriated profits, were increased by £20,548, bringing the total up to £80,666. You may ask why, in such circumstances, the rate of dividend was reduced. I would remind you that the rate of the last dividend had to be fixed early in March, and that the profits for the preceding few months had, as a consequence of our dealing with so large a proportion of the Clewer ore, fallen below the rate sufficient to pay 15 per cent. for the half year. During March, however, some particularly rich ore was stoped at Columbia Hill, which, added to the fact that the gold in reserve, to the value of £5,667, was included in the month's declaration, brought the profit declared for the month up to the very high figure of £25,700. It may be added that the monthly profits have since been abnormally large, the amounts being: April, £22,183; May, £23,258; June, £20,780. Let me lay stress on the word "abnormally," as, so far as we can foresee at present, these are likely to be above the average monthly returns, due to the necessity for rapidly working out the Clewer mine without time or opportunity of selecting the ore or endeavouring to average the yield. Mr. Brown, when addressing you last year, mentioned the fact that the concession on the farm Morgenzon, on which the Clewer mine is situated, will expire shortly—actually on May 5, 1913. Some of you may ask what is to happen after that date, and I would recall to you the reply given by the chairman at the annual meeting held in Johannesburg last October to a shareholder who inquired what steps were being taken to replace the Clewer mine. The chairman said he felt confident that they would more than replace the Clewer through the work that was being done at Peach Tree and Columbia Hill. The development work carried out during the year was, on the whole, satisfactory, as, notwithstanding the fact that the tonnage milled was increased by 19 per cent., as much ore was developed as was sent to the mill. This must be regarded as good work, particularly when we bear in mind the scarcity of native labour that prevailed. The ore reserves at March 31 last were about the same in quantity as a year previously, but showed an improvement of ·17 dwt. (nearly 9d.) per ton in value. By the extension of the slimes plant and crusher house it is hoped to bring the tonnage crushed at the Central mill up to 13,000 tons a month, which, with the addition of the tonnage from Elandsdrift and Vaalhoek, would mean a total crushing of nearly 15,000 tons per month. Mr. C. G. Harper said the shareholders were to be congratulated upon the year's progress, the recovery after the fall in the monthly returns last summer and autumn having been very gratifying indeed. The chairman, in reply to questions, said that, in consequence of the declarations of 27½ per cent. dividend instead of 30 per cent. for the past year, the balance remaining—which, after all, was really the result of abnormal conditions—formed a nice little nest-egg, and it would, no doubt, enter into the calculations of the directors when they fixed the dividend for the coming year. With regard to the market price of the company's shares, he thought that was easily accounted for by the general depreciation which had taken place in all markets; personally, he knew of no other reason for the fall. Replying to a further question he mentioned that the company's properties extended over about 300 square miles, so that there were infinite possibilities in them. A vote of thanks to the chairman, on the motion of Mr. Buckler, closed the proceedings.

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FINANCING THE FALCON MINES, LTD.

Proposed Addition to Capital to give Effect to Mr. Piper's Views.

The object of the Falcon meeting which was convened for Aug. 1 are (1) authorising the creation of £300,000 of 6 per cent. first mortgage convertible debenture stock, and in connection therewith (2) the passing of the necessary resolution to increase the share capital of the company from £400,000 to £600,000 by the creation of 200,000 additional ordinary shares. Mr. Piper, in his recent report, recommended the immediate erection of a plant to treat not less than 15,000 tons per month, and, in view of the continued excellent results shown by development in depth, the Board has been enabled to secure the necessary funds on what they believe to be most satisfactory terms. The engineer's estimate of the entire cost of the plant, including opening up of the necessary fluxes, water supply, additional compounds and cost of continuing development during the erection of the reduction works, is £310,000, against present cash resources of £40,000. The Board has accepted the offer of the Gold Fields Rhodesian Development Co., Ltd., to guarantee the issue of £250,000 of the debenture stock for a commission of 5½ per cent. in cash; the call at par till July 31, 1915, on the £50,000 unissued debenture stock, carrying conversion rights; and the call at 35s. till the same date on the remaining 28,572 reserve shares, not required for conversion rights, which latter call will be utilised by the Gold Fields Rhodesian Development Co., Ltd., for the purpose of satisfying an option granted to third parties at the time of and in connection with the purchase of the Athens mine. £250,000 of the debenture stock will be offered at par to shareholders at the rate of £5 of stock for every eight shares held. The stock will carry the right till July 31, 1915, to convert into ordinary shares at the rate of £1 15s. of debenture stock per £1 share. Of the 200,000 additional shares to be created, 171,428 will be held in reserve for the conversion of the debenture stock, and the balance, 28,572, will be under option to the guarantors, as stated above. Judging from the present development of the mine, and on the basis of copper at £56 per long ton, it is estimated that the annual profits should be £125,000, to which £104,000 has to be added with copper at £78 per ton.

THE CLOSING DAYS OF THE SALISBURY.

Financial Position of the Company—Rhodesian Interest—The Dividend Record.

At the annual meeting of the Salisbury Company, last week at Pietermaritzburg, the Chairman said: Before making any general remarks it would be as well to say something about the accounts. The capital remains the same. Sundry creditors, £1,114 5s. 1d., as against £158 last year, shows an increase of £956. The principal item of this account is £1,000 loan to another company, and there are a few outstanding accounts. Employees' Insurance Fund shows an increase of £111, which we have received as interest. Property account and joint holdings remain the same. Plant has been slightly reduced in consequence of some sales since the mine closed down, and buildings increased by slightly over £100 for items expended on the head-gear, which had been charged to the Manager's Account, and have now been transferred. The fixed deposit of £10,000 shown in last year's account was used for the payment of dividend, £6,750, declared last year, and the balance in payment of our liability to the Claremont Mines. Our profit on mining, after deducting profit tax for the previous year, amounts to £721, and as I will point out presently this represents the balance of profit for the first and fourth month's working and the final clean up. From sundry revenue we have received £273 more than last year. Soon after our meeting last year we received notice from the manager that he had no difficulty in getting ample supplies of ore, but that it was of low grade, and he would have difficulty in keeping up the rate of profit; and towards the end of August we received intimation from the Jubilee Company that their mine was closing down, and that the whole cost of management and milling must, in future, be borne by the Salisbury Company. Every effort was made to keep down expenses, and we were slightly encouraged by an improved grade in September. Unfortunately the reef pinched out in the east main reef leader stope between the 11th and 12th levels. This stope, for the previous two years, had given up a monthly average of 1,330 tons of 6.3 dwt. ore. Towards the end of October the acting manager reported that unless he could find some richer ore he feared the mine would have to close down at the end of the year, and till then he was of opinion that by treating double the quantity of accumulated slimes the company might make a small profit. And so we struggled on till the end of the year, the profits and losses for the period having been: July profit, £951; August loss, £288; September loss, £161; October profit, £301; November loss, £122; December loss, £146; January loss, £196; February profit, £800. At the 31st December the employees received notice that their services would not be required after the end of January, but at the same time were told this notice was given as a safeguard to the Company, and they would be retained on daily pay so long as the mine could be kept open. Before finally deciding to close down, we asked Mr. C. Glyn, manager of the City and Suburban Company, to make an inspection of the mine and report. This report fully confirmed our acting manager's opinion that it was no longer possible to work the mine at a profit, and that everything possible had been done at the mine to prolong its life. The mine was, therefore, closed on the 31st January, and only a few hands, absolutely necessary for the final clean-up and safeguarding of machinery and property, retained. Early in March we received the report of the final clean-up, which resulted in a profit of £800 for February working. All open cuttings have been fenced in, and certificate of clearance has been granted. Owing to a short supply of water during the last two months the treatment of accumulated slimes was considerably curtailed. We have entered into an agreement with two of the employees of the Company to work these for our mutual benefit, and the first clean up shows a profit of about £80, which we hope will be improved upon with the better water supply which is now available. Although it would no longer be profitable for the Company to continue working the mine, there is a large quantity ore *in situ* which might pay a tributor to work. We have been approached by one or two people on the subject, and we have now arrived at the stage when we must decide whether it is better to tribute the mine or surrender our licences and realise the assets remaining on the property. Those of you who read the Johannesburg papers will have noticed that the Corporation has been negotiating for the acquisition of the freehold of our claims, and had an option to purchase for £25,000. We have done nothing towards winding-up, because we expected the option would be exercised. Unfortunately for us differences of opinion regarding value and the suitability of the site for a native compound existed amongst the Councillors, and, so far as this Company is concerned, we are now free to make our own arrangements regarding the disposal of the claims. For the last eight years it has been the Chairman's pleasant duty to allude to the dividends that have been paid during the year under review. I regret I am not in a similar position to-day. All mines come to an end in time, and we must take it that, so far as dividends are concerned, this Company is not likely to receive any more from its original mine. But we still have a valuable asset in our holding of 33,000 shares—one-third of the capital in the Claremont Mines, Rhodesia. These mines are now producing, and during the first-half of the year have earned profits at the rate of nearly £1,000 per month. Mr. L. Line seconded the motion. Mr. A. H. Hime asked what the future policy of the Company was going to be. The Chairman replied that the Company had been in existence for 26 years, and amounts had been paid out in dividends up to 405 per cent., in addition to distribution of South City shares of 20 per cent., and Village Main Reefs of 25 per cent. The Directors were on the look out for any proposition that could be worked at a profit, with the object of keeping the Company going as long as possible. Endeavour would also be made to let the mine on tribute to any suitable party, and offers were already under consideration.

High Mining Salaries

EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings; Box 2061.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Brakpan versus Modder B.

To the Editor, *South African Mining Journal.*

Sir,—In your "Notes and News" comments in your issue of August 10th, on the splendid progress being made at Modder B, you conclude by saying, "We can call to mind no other instance of a Rand mine attaining to such a highly satisfactory position within nine months of the commencement of crushing as has the Modder B." This is a lamentable confession of a weak memory for a paper of your standing. Recent mining history provides an even better instance of progress. The Modder B. reaches £36,000 profit in nine months; the Brakpan mine made a profit of £46,922 within nine months of starting crushing *average ore.* Modder B. is confessedly crushing ore above the average grade of the mine!—Yours, etc.,

ONLOOKER.

[We would ask "Onlooker" to be more sure of his facts and figures before taxing us with a weak memory. In April last the Brakpan Mines announced a profit of £46,922 (as stated by "Onlooker"), but if our correspondent had taken the trouble to read the returns carefully he would have found that this included £15,973 reserves. The actual working profit was thus only £30,949. Therefore, our contention regarding the Modder B. must stand. The advisability or otherwise of crushing ore above the average grade or the mine is a question which the consulting engineer is best able to decide.—Ed.]

The Future of the Banket Series.

To the Editor, *South African Mining Journal.*

Sir,—The contribution from the pen of Mr. David Draper in the *South African Mining Journal* of July 20th on the above subject would lead the ordinary reader to believe that Mr. Draper has adopted the rôle, self-constituted though it may be, of champion and general advocate for the geologist brotherhood of the Rand. Anything more arrantly egotistical than the article under notice it would be hard to conceive, and the brotherhood are not to be congratulated upon their choice of advocate, either on the present or on a former occasion. It may be that neither himself nor his opinions are taken seriously by his confreres, and we may yet read other opinions upon the future of the Banket Series in South Africa. The egoism expressed in the paragraph—"Knowing that I was only stating publicly what most geologists have long privately believed, I did not expect a strong opposition"—is typical. Are his fellow-geologists afraid of the ridicule invited by a too free acquiesence in the dogmatic theory that the finding of payable banket reefs outside of the Main Reef series is beyond the region of possibilities? From the paucity of replies on the subject, for or against, it would appear so. Not many have taken up the cudgels on behalf of the despised outside districts, but to those who have he poses as the great "I am" of the geological world. His replies simply mean "I only am right—you who differ from me are wrong." Beginning with the sensible editorial comments on his first article, which are not to his liking, he goes on to pooh-pooh the assumption of Mr. C. Baring-Horwood that the diabase intrusions on the Rand may account for the enrichment of the conglomerates. So far as his knowledge of diabase dykes is concerned they do not bring about any enrichment of the conglomerates at the point of intersection. It seems only a year or two ago, but in reality it is much longer, when we were stoping in the Crown Mines the "pay streak" at the point of intersection of a diabase dyke was so abnormally rich that the management had recourse to brooms to sweep up the dust from the floors of the stope in order to save the shed gold. If memory does not fail, the value of the "pay" was something like 1,500 ounces to the ton. But then, according to Mr. Draper's theory, the diabase intrusion had nothing to do with this enrichment; we, who were not geologists, thought it had. It is, however, in replying to Mr. Hallimond, the great "I am" shines supremely. In referring to an outside district in which he is interested, Mr. Hallimond puts the query, "How many geologists have attempted, *in a proper manner,* to find a payable reef?" To this Mr. Draper indignantly replies that not only himself but several other well-known geologists had spent many months in the district and "endeavoured by every means in our power, including the expenditure of large sums of money, to discover something payable, but we utterly failed." After this, of course, there is nothing to be said—the district is damned, doubly damned for evermore. Two queries might here be asked of Mr. Draper: (1) How many geologists are there who have actually discovered at first hand a payable gold reef, or other payable mine? (2) How much does the common or garden prospector, to whom we are mostly indebted for valuable discoveries all the world over, know of up-to-date geology? Theory and a smattering of geology does not make the prospector, neither do expensive outfits and lavish expenditure of money. How many instances are there on record where, after the Nabobs of their profession have had their innings, the time-worn, weather-beaten fossicker comes along and "strikes it rich." In prospecting, grit is wanted more than theory. That dogged persistence so common to the genuine prospector, who rarely, if ever, knows what it is to be beaten, whose motto is "better luck next time"; optimistic ever, always looking forward to the fortune that never materialises. These are the men who have made the mining world what it is to-day, and not our friends the geologists and others, who visit a district and take a general survey, tap a rock here and there, pan a likely looking piece now and then, make a note of some formation which, according to their theory, was not in its proper place, get up data for a paper to read before the Geological Society, and then return to their homes and report they had "thoroughly prospected" such and such a district and had utterly failed to find anything payable, therefore any attempt to discover a payable mine in that district "may be set aside as beyond the region of probabilities." They are sometimes made an F.G.S., and are satisfied. Geologists and other mining experts are not infallible, although anyone reading Mr. Draper's articles would imagine they are. Opinions amongst them vary, as in other professions, *vide* the early experiences on the Rand and elsewhere. An article of Mr. Draper's published three or four years ago occurs to mind at the moment. It was in connection with the discovery of tin in the Waterberg district, and relates how, after the prospector's samples had been rejected by a leading financial house in Johannesburg as being worthless, containing no metal of any value, they were brought to Mr. Draper, who discovered that they contained 40 per cent. tin. Here was a difference of opinion between experts with a vengeance; but Mr. Draper was right in this instance, and hence the Waterberg tin industry of the present day, *vide* the article referred to. Not so fortunate was the geologist who reported for the Hope Valley Diamond Syndicate a few years back. The coloured glass beads there discovered were not the diamonds, emeralds, and rubies which they were described as being. It was rather too bad to hoax a learned geologist like that. But to return to the future of the banket series. Mr. Draper does not like to hear anything to the detriment of the Rand financial groups. He holds no brief for any house in South Africa, but he is sufficiently in their confidence to know that they are not insane enough to decline to develop a property that offers a fair chance of a good return on capital. "They are searching all the continents of the globe for mines: why should they refuse to develop the Zululand reefs, which are so near their headquarters." Try them, Mr. Draper. Offer any of the leading Rand houses a Zululand mining proposition, no matter how good it may be: it would be a good test of their sanity. The sardonic grin with which all such propositions from Zululand is met is pretty well known by this time. It really is meant for a sympathetic smile, as much as to say: "Is it possible that you really think that anything good can be found in Zululand?" 'Twas ever thus—ever since Zululand was "thoroughly prospected" eighteen years ago. It is not a case of we Zululanders having for our motto "Damn the Rand financiers," as suggested by Mr. Draper. Reverse the condemnation and say "Damn Zululand," and you have the Rand motto. They did so in 1894 when Rand mining was booming, when every penny spent outside of the Rand mines was begrudged. If Zululand banket had been investigated as thoroughly at that time as it has been recently, the industry would have been flourishing long since. Before concluding this letter, "friend Ego" wishes to assure Mr. Draper that it was with no intention of advertising the "Somali mines" he made reference to them in his last article on this subject. "Good wine needs no bush," neither does the mine in question need advertising. Reference was made to it, as it happens to be the only banket proposition being developed in the province at present. Mr. Draper has only been once in this part of the country, and then for an hour or two, and yet he is able to speak authoritatively that a payable mine in the district is an impossibility. He has never seen the banket series to which the writer referred in his last article, yet this gentleman, sitting in his office chair in Johannesburg, issues the dictum, "six pennyweights over fifteen inches will not pay." Circumstances alter cases. Such a proposition would probably be unpayable on the Rand, but not where it is presently situated. One or two of the mines on the Rand have reduced their working costs to 11s. per ton milled. At the mine above referred to, it is questionable whether little more than half that amount would be necessary. There is to be considered the difference between water power and steam or electrical power, the former costs nothing, the coal bill on the Rand is a considerable item. There is the difference between adit mining where all ore is run to the mill by gravitation, and the expense of deep shafts and the necessary hauling and hoisting gear. These are only two of the items to be considered, but quite sufficient to prove the absurdity of Mr. David Draper, or anyone else, trying to lay down what mine will pay or will not pay, without first becoming conversant with the working and other conditions. Reference is here made to only one of the reefs referred to the first instance; we may presume accordingly that Mr. Draper has nothing to urge against the payability of the other reefs. As soon as the mine is in the producing stage, the writer will, without fail, acquaint Mr. Draper of the fact.—Yours, etc.,

"EGO."

POSITION OF THE ELDORADO BANKET.

Directorial Changes—45 per cent. in Dividends—Gold Fields take Control.

The Eldorado Banket profit on the year's operations amounted to £116,691, from which £23,719 has been deducted on account of depreciation of machinery, etc., leaving £92,971 which, added to the sum of £27,682 brought forward, makes a total to the credit of £120,653. Out of this the two dividends of 15 per cent. each have been paid, and a further one of 15 per cent. has been declared. The balance carried forward at March 31 was £27,653. The mine profit was £119,946. The report of Mr. H. A. Piper shows that during the year the pay chute on the seventh level was extended to a total distance of 790 ft., and at the eighth level of 325 ft. The pay chute on the main reef on the eighth level was 115 ft. in length, averaging 52·6 dwts. over 72 inches. The amount of payable ore reserves on the parallel reef on this level was decreased owing to faulted ground. On the ninth level the Main Reef pay chute was 110 ft. in length, of an assay value, according to the new method of calculation, of 22·9 dwts. over 73 inches, approximately the same length as in the previous two levels. The tonnage of ore developed at March 31, 1912, amounted to 149,749 tons of an average assay value of 15·13 dwts. per ton over a stoping width. This shows a decrease of 47,594 tons over last year's reserves, largely due to the faulted ground encountered on the eighth level. Dr. Hans. Sauer, Sir Abe Bailey, and Messrs. Walter Forbes and A. J. Sharwood have resigned their seats on the board, and Messrs. R. G. Fricker, H. G. Latilla, J. C. Prinsep, Major H. L. Sapte and Admiral Sir A. H. Markham, K.C.B., have been appointed directors; Mr. Fricker having been elected chairman. Messrs. G. Seymour Fort and Donald Fraser retire under clause 83 of the articles of association. Mr. Donald Fraser does not propose to offer himself for re-election, and an application to fill the vacancy caused by his retirement has been received from Mr. T. Thackthwaite, whose candidature is recommended by the Board, and he will be proposed as a director. The Gold Fields Rhodesian Development Co., Ltd., has been appointed secretaries to the company, and the offices have been removed to 8, Old Jewry, London, E.C.

Benoni Consolidated.

The report for the quarter ended 30th June, 1912, states:—Revenue and Expenditure (including revenue from the final clean-up of the works): To mining account, £13,167 15s. 8d.; to mine development, £731 2s. 11d.; to reduction expenses, £7,149 14s. 1d.; to general charges, £3,421 16s. 8d.; to total working costs, £24,470 9s. 4d.; to net working profit, £1,715 10s. 11d.; to revenue, £26,186 0s. 3d. Mine.—East Shaft: Stoping operations were carried out on the Main Reef and Upper Main Reef, and 12,138 tons from this section were sent to the crusher station. Central Shaft: 7,770 tons of Main Reef were sent to the crusher station from this section. Development and Values: The footage driven, risen and sunk on the reef was 244 feet 6 inches, the payable sections of which were as follows: Footage, Main Reef, 107 feet; average stope width, 50.17 inches; average stope value, 6.68 dwts. Ore Treatment.—Tonnage mined (including ore obtained from development faces), 19,908 tons; tonnage received from surface dump, 281 tons—20,189 tons; less sorted out, 12.82 per cent., 2,589 tons; tons milled, 17,600 tons. Capital Expenditure.—There was no capital expenditure for the quarter. Ore Reserves.—The ore reserves on a milling basis at the end of the quarter were as follows: Payable, 537,475 tons, 44.74 milling width ins., 6.43 assay value dwts; unpayable, 360,738 tons, 46.10 milling width ins., 3.31 assay value dwts., totals and averages, 898,213 tons, 45.28 milling width ins., 5.18 assay value dwts. General.—Mining and development operations were suspended on the 3rd of May as a result of the closing down of the reduction plant. Since that date, the only work carried on in the mine has been the pumping of water. Reduction Plant.—Crushing and treatment operations were suspended on the 3rd of May, pending the re-modelling of the cyanide works. During May and June a final clean-up was made of the gold remaining on the plates, and in the tube mills and cyanide works generally. This clean-up yielded 1,915 ozs. fine gold, and it is estimated that some 400 to 600 ozs. still remain in the plates; in other words, during the first few months of running the plant absorbed some £10,500 worth of gold. The plant is now under the protection of competent caretakers.

WANTED.—Small Chilian Mill or Cobbe Pan. State price F.O.R Barberton.
P. 67, Central News Agency, Johannesburg.

DETAILS OF THE JULY OUTPUT.

An Increase on June Equal to a Half-day's Production—No Improvement Shown—Few Features.

The gold output for the Transvaal was declared by the Chamber of Mines, last week, at 766,338 ozs., of the value of £3,255,198, which is an increase on the June return of 12,402 ozs., value £52,681. The increase is about equivalent to a little more than half-a-day's production, whereas July contained one working day more than June. The Rand yield of 735,941 ozs., value £3,126,077, which shows an increase of 13,353 ozs., value £56,717, is proportionally over the half of a day's average yield for the month, because outside districts with a total of 30,397 ozs., value £129,121, show a decrease of 951 ozs., value £4,036, though twenty-five more stamps and one additional tube mill were in operation. On an average basis the return is below that of June. Though fewer stamps were running more tons were crushed. There is another substantial shrinkage in the labour complement. Whereas last month is responsible for a quarter of a million sterling more in output than for the corresponding month of 1911, the increase in the labour return over last year is no more than 1,400. While there is an increase in the amount of gold won in July compared with June, the total of the group profits is some £20,000 less, the main cause of which is traceable to the decline in labour and the substitution of raw boys for some of those who have left.

LEADING FIGURES.

The following are the chief figures for the month:—

Total output	766,338 ozs.
Value	£3,255,198
Increase	12,402 ozs.
Value	£52,681
Rand output	735,941 ozs.
Value	£3,126,077
Increase	13,353 ozs.
Value	£56,717
Outside districts	30,397 ozs.
Value	£129,121
Decrease	951 ozs.
Value	£4,036
Total stamps	10,063
Decrease	30
Rand	9,460
Decrease	55
Outside districts	603
Increase	25
Tube Mills	269

LABOUR.

There is again a decrease of 5,317 for July, according to the W.N.L.A. figures compared with June, on the total employed on gold, coal and diamond mines. There is a decrease on gold mines of 5,569, and on coal mines of 52, while diamond mines increased their complement by 304. The figures for the past three months of the number employed by members of the W.N.L.A. at the end of each month read:—

	June.	July.	Aug.
Gold	193,829	188,494	182,925
Coal	8,460	8,549	8,497
Diamonds ...	14,538	15,530	15,834
Totals ...	216,827	212,573	207,256

THE STAMP POSITION.

The stamp position shows a decrease on the Rand of 55 stamps, but two more tube mills were in operation, while on outside mines 25 more stamps and one tube mill were working. The changes of details are as follows:—Rand: Jumpers 5, Jupiter 15, Robinson Deep 30, Roodepoort United 5; total, 55. Outside: Increase, miscellaneous, 25; decrease, 30. There were 261 tube mills operating on the Rand and eight in outside districts.

THE PROGRESSIVE OUTPUT.

Total productions, 1912:—January, 737,060 ozs., £3,130,830; February, 703,866 ozs., £2,989,832; March, 830,723 ozs., £3,528,688; April, 737,660 ozs., £3,133,383; May, 779,662 ozs., £3,311,794; June, 753,936 ozs., £3,202,517; July, 766,338 ozs., £3,255,198. The following are the details of production of the twelve leading companies:—

	Stamps.	Tube Mills.	Tons Crushed.	Value.
Crown Mines	660	22	166,000	£269,837
Randfontein Central ...	700	29	226,922	257,973
E.R.P.M.	820	25	155,400	256,380
Ferreira Deep	235	7	53,390	106,112
Robinson	250	6	47,700	98,433
Rose Deep	300	7	66,000	95,285
Brakpan Mines	150	6	56,315	90,477
Simmer and Jack	320	7	76,000	88,824
Village Main	220	5	42,800	87,057
Nourse Mines	260	7	57,000	86,101
New Modderfontein ...	180	7	41,500	83,192
Robinson Deep	210	6	47,500	79,229
Totals	4,305	134	1,036,527	£1,598,900

GROUP PROFITS.

The following are the profits returned for May, June, and July by the mines controlled by the different groups:—

	May.	June.	July.
Rand Mines	£238,284	£242,288	£241,295
Rand Mines-Eckstein group	243,784	231,590	229,719
Gold Fields	117,305	113,230	113,525
E.R.P.M.	95,024	92,256	91,262
Barnato	66,133	67,467	68,311
General Mining	67,968	63,403	60,198
Neumann	57,213	60,362	61,770
Cons. Mines Selection ...	40,317	40,804	41,077
Goerz	14,255	15,017	13,185
Kleinfontein Group ...	19,517	23,088	22,509
Robinson Group	—	88,450	76,029
Totals	£959,800	£1,037,905	£1,017,880

INCREASES AND DECREASES.

The following returns of the July output have been filed with the Chamber of Mines. The increases and decreases compared with June are subjoined:—

The Witwatersrand.

	June.	July.	Inc.	Dec.
	£	£	£	£
Aurora West	17,649	18,078	329	—
Brakpan Mines	89,584	90,477	893	—
Bantjes	34,125	33,701	—	514
Crown Mines	255,161	269,837	14,676	—
Consolidated Langlaagte	30,150	30,401	251	—
Cinderella	25,444	21,710	—	3,734
Consolidated Main Reef	34,993	34,572	—	421
City and Suburban	52,621	52,532	—	89
City Deep	75,168	76,952	1,784	—
Durban Roodepoort	14,778	15,177	399	—
Durban Deep	37,533	37,185	—	348
East Rand Proprietary Mines	249,881	256,380	6,499	—
Ferreira Deep	104,307	106,112	1,805	—
Geldenhuis Deep	83,447	74,390	—	9,057
Ginsberg	21,566	21,341	—	225
Glencairn	16,456	16,231	—	225
Geduld	18,626	18,809	183	—
Jupiter	41,471	41,802	331	—
Jumpers-cum-Treasury	14,158	15,050	892	—
Knights Deep	50,187	53,241	3,054	—
Knight Central	27,521	29,322	1,801	—
Lancaster West	24,492	22,539	—	1,953
Langlaagte Estate	61,694	64,137	2,443	—
Luipaardsvlei	15,755	16,065	310	—
May Consolidated	17,828	18,002	174	—

	June.	July.	Inc.	Dec.
	£	£	£	£
Meyer and Charlton	25,852	37,401	11,549	—
Main Reef West	32,355	33,315	960	—
Modder B.	60,067	66,719	6,652	—
New Unified	17,161	17,096	—	65
New Rietfontein	20,045	19,820	—	225
New Primrose	35,711	36,777	1,066	—
New Modderfontein	86,225	83,192	—	3,033
New Heriot	23,876	22,092	—	1,784
New Goch	26,574	26,663	89	—
New Kleinfontein	72,216	73,885	1,669	—
Nourse Mines	84,067	86,101	2,034	—
Princess Estate	24,514	26,128	1,614	—
Randfontein Central	249,478	257,973	8,495	—
Rose Deep	95,837	95,285	—	552
Robinson	104,724	98,433	—	6,291
Robinson Deep	80,023	79,229	—	794
Roodepoort United	30,660	32,546	1,886	—
Simmer East	31,369	33,230	1,861	—
Simmer and Jack	86,955	88,824	1,869	—
Simmer Deep	44,015	47,838	3,823	—
Spes Bona .,.	6,529	6,779	250	—
Van Ryn	50,765	54,239	3,474	—
Village Deep	69,998	68,571	—	1,427
Village Main Reef...	79,012	87,057	8,045	—
Vogelstruis Estates	12,273	12,264	—	9
West Rand Centrals	3,581	3,560	—	21
West Rand Consolidated	35,970	38,408	2,438	—
Wolhuter	40,290	38,790	—	1,500
Witwatersrand	46,559	45,540	—	1,019
Witwatersrand Deep	52,859	54,906	2,047	—
Miscellaneous	24,262	18,872	—	5,390
Outside Districts.				
Barrett	714	888	174	—
Glynn's Lydenburg	7,298	8,143	845	—
Nigel...	20,410	18,049	—	2,361
Worcester	5,539	5,467	—	72
Sheba	15,959	13,550	—	2,409
Sub-Nigel	8,096	9,540	444	—
Sheba Rosetta...	1,253	433	—	820
Transvaal G.M. Estates	36,637	34,598	—	2,039
Miscellaneous	37,251	38,453	1,202	—

OUR MONTHLY TABLE.

The following is our usual monthly table:—

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	14,539	80	4,256	£18,078
Bantjes Consolidated ...	24,383	85	7,934	33,701
Brakpan Mines	56,315	150	21,300	90,477
City Deep	41,000	110	18,116	76,952
City and Suburban	28,091	140	12,367	52,532
Cinderella Cons.	17,760	80	5,111	21,710
Cons. Langlaagte Mines ...	20,978	140	7,157	30,401
Crown Mines	166,000	860	63,525	269,837
Durban Roodepoort ...	14,052	90	3.513	15,177
Durban Roodepoort Deep ...	25,470	100	8,754	37,185
East Rand Proprietary ...	155,400	820	60.357	256.380
Ferreira Deep	53,390	235	24,981	106,112
Geldenhuis Deep	48,700	300	17,513	74,390
Ginsberg	14,071	80	5,024	21,341
Glencairn Main Reef ...	20,237	160	3,821	16,231
Geduld Proprietary Mines ...	14,480	50	4,428	18,809
Jupiter	41,550	105	9,841	41,802
Jumpers-Treasury	7,000	70	3,586	*15,232
Knights Deep	62,200	270	12,534	53,241
Knight Central	23,550	105	6,903	29,323
Lancaster	20,500	100	5,306	22,539
Langlaagte Estate	53,811	200	15,099	61,137
Luipaardsvlei Estate ...	18,500	60	3,782	16,065
Main Reef West	20,850	100	7,843	33,315
May Consolidated	16,020	100	4,238	18,002
Meyer and Charlton ...	14,427	75	7,307	*31,038
Modderfontein B.	33,780	80	15,717	66,719
New Goch	27,305	120	6,277	26,663
New Heriot	11,400	70	5,201	22,092
New Kleinfontein	51,100	220	17,394	73,885
New Modderfontein	41,500	180	19,585	83,192
New Primrose	23,900	160	8,658	36,777
New Rietfontein Estate ...	16,000	120	4,666	19,820
New Unified	11,310	60	4,025	17,097
Nourse Mines	57,000	260	20,270	86,101
Princess Estate	19,200	60	6,151	26,128
Robinson	47,700	250	23,173	98,433
Robinson Deep	47,500	210	18,652	79,229
Randfontein Central ...	194,243	700	60,732	257,973
Roodept. United Main Reef	34,171	55	7,662	32,546
Rose Deep	66,000	300	22,432	95.285
Simmer Deep	52,000	135	11,262	47,838
Simmer and Jack	76,000	320	20,911	88,824
Simmer and Jack East ...	34,000	130	7,823	33,230
Spes Bona Tribute	6,488	40	1,596	6,779
Van Ryn Gold Mines ...	40,270	130	12,769	54,239
Village Deep	52,000	180	16,143	68,571
Village Main Reef	42,800	220	20,195	87,057
Vogelstruis Estates	11,527	70	3,005	12,764
West Rand Central	1,921	20	838	3,560
West Rand Consolidated ...	27,000	100	9,042	38,408
Witwatersrand	40,010	220	10,721	45,540
Witwatersrand Deep ...	38,560	245	12,926	54,906
Wolhuter	29,300	120	9,752	*41,424
Miscellaneous producers ...	—	110	4,443	18,872
HEIDELBERG—				
Nigel	12,000	75	4,433	*18,830
Sub-Nigel	4,610	30	1,996	*6,478
BARBERTON—				
Barrett	—	—	209	888
Sheba-Rosetta	327	20	102	433
Sheba	6,500	70	3,190	13,550
Worcester Exploration ...	4,300	40	1,287	5,467
LYDENBURG—				
Glynn's Lydenburg	3,480	20	1,917	8,143
Transvaal Gold Min. Estate	13,895	75	8.145	34,598
KLERKSDORP—				
Miscellaneous producers ...	—	273	9,058	38,453

* Jumpers-cum-Treasury, includes 43 ozs., value £182, taken from reserve. * Meyer and Charlton, does not include 1,498 ozs., value £6,363, taken from actual output and added to reserve.

* Wolhuter, included in the above total 620 ozs., value £2,634, taken from reserve gold. * Nigel, included in the above total 184 ozs., value £781, taken from reserve gold.

* Sub-Nigel does not include 250 ozs., value £1,062, taken from production and added to reserve.

Mr. Cox-Moore, chairman of the Northern Transvaal Minerals, Ltd., and Mr. E. Hay, Sen., are visiting farms in the Northern Transvaal, with a view to the adoption of an active development policy.

* * * *

Mr. Gilbertson, at present underground manager of the Rooiberg Mine, has been appointed to the management of Zaaiplaats, and Mr. Furner, the present manager of Zaaiplaats, has been appointed consulting engineer to that mine.

Situations Wanted.

To Mine Managers and Mine Captains.

A first-class PLATELAYER seeks situation on the Reef. Good underground discharges. Holder of Blasting Ticket.

Apply J. G. MURRAY,
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Rhodesian Section.

LATEST MINING NEWS.

Another Amalgamation?—The Bushtick Plant—The Eldorado Puzzle—Salisbury Chamber of Mines—An Improvement at the Wanderer—Antelope Developments—The Falcon Meeting—Railways in Katanga.

Is another huge amalgamation of interests in Rhodesia pending? It is rumoured in Salisbury that the Gold Fields Rhodesian Development Company and the London and Rhodesian Company have been discussing certain preliminaries which may have as their outcome the absorption of the latter company by the Gold Fields. The Gold Fields Rhodesian Development Company already controls, or has large interests in, the majority of the leading gold mines of Southern Rhodesia, and should the London and Rhodesian mines also come under the parental wing of this great corporation, the Cam and Motor, the Hay, and a number of other properties will be under the management of Messrs. Mitchell and Macdonald, and the consulting engineership of Mr. H. A. Piper. So far nothing definite is known as to the reported absorption, but should it be arranged the power and influence of the Gold Fields Company in Rhodesia will, of course, be even greater than it is to-day.

* * * *

The reduction works of the Bushtick Mine are being enlarged and altered substantially. The existing plant consists of twenty stamps and three tube mills, and this is now being enlarged by the addition of four Nissen stamps and one Krupp tube mill. These additions will bring the capacity of the plant up to 10,000 tons per month by the end of the current year. The present capacity is 6,000 to 7,000 tons per month.

* * * *

The Eldorado mystery is increased rather than diminished by the speech made by Mr. Fricker at the meeting held in London the other day. The chairman emphasised that he did not share the anxiety which had been frequently expressed regarding the future of the mine. He explained that the decrease in the ore reserves was not due to any suspension of development work, but was mainly owing to a good deal of ore being cut off by a fault on the eighth level. During the meeting the following cablegram from the Rhodesian office of the company was read:—" Level No. 9 main reef pay shoot same length as on No. 7 and No. 8 levels but higher values than on No. 8. Parallel reef 100 ft. payable reef exposed to date, whilst on No. 8 level there is no corresponding pay ore. No. 1 main winze to 10th level depth of 77 ft. assaying 40 dwts. over 72 ins. This is the deepest point in the mine. East drive off main cross-cut advanced 285 ft., face assaying 30 dwts. over 65 ins. Parallel East drive off north cross-cut at 391 ft. east passed through dyke at 577 ft. east. Winze No. 2 east parallel at 390 ft. east looking well; depth of 40 ft. assaying 8 dwts. per ton over 65 ins." It is very difficult to reconcile the heavy fall in the price of the shares and the many rumours that have of late been afloat regarding the mine with these statements. Whilst generally well-informed Rhodesian opinion insists that the pay chute in the mine has contracted, official statements appear to give the lie direct to these views.

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The annual meeting of the Salisbury Chamber of Mines was held last week, when the annual report and balance sheet were presented. Both were eminently satisfactory, especially the balance sheet, which shows a revenue for the year ending March 31st last of £1,448 7s. 2d., and an expenditure of £424 8s. 5d. The surplus is, therefore, no less than £1,023 18s. 9d. During the year, four individual members and one company resigned; the present membership consists of ten companies and sixteen individuals. This number, in view of recent local flotations, is not unlikely to be increased. The report covers a number of matters, and is somewhat lengthy. Dealing first with the Native Labour Bureau, its history during the past year is briefly reviewed, and the hope expressed that, in view of the paramount importance to the mining industry of an organised system of native labour recruiting, the Legislature will be able to find a *modus vivendi* satisfactory to all parties concerned. With regard to prospecting on private lands, the committee state that they have nothing to report; but, on the subject of health and sanitary regulations, the report of a sub-committee is referred to, from which it seems that the sub-committee are of opinion that too much power is vested in the Medical Inspector. They recommend that, in the event of the proposed standing committee on mining regulations being approved by the Government, the powers vested in the Medical Inspector should be transferred to the committee; and, further, that in all mining districts, where considerable mining operations are carried on, the Government should provide native hospital accommodation. After touching upon the question of native mortality on mines, the report refers to the British South Africa Company's Development Company, which, though at first viewed by the committee with considerable misgiving, they do not think it necessary to adversely criticise, having regard to the fact that assurances have been given that the new company will be in every respect on the same footing as regards flotations, royalties and taxation as other companies. With regard to the subject of mining royalties, the committee think that the basis upon which they are calculated is a bad one, and it is suggested that the Chartered Company should be urged to reduce the royalty where the ore is of a refractory nature.

* * * *

There has been an improvement in grade at the Wanderer. Working expenses, including development for the month of June, are returned at £6,401, the total value of the recovery being £7,559. These figures compare very favourably with those recorded for the preceding month. Such a result is especially encouraging coming, as it does, just after the rather unsatisfactory annual report of the company. This latter document shows that a profit of only £7,962 was earned, and stated that the grade of ore from the Camperdown mine has fallen materially, and this is solely responsible for the comparatively poor results. The manager is not very hopeful of this property, for, after mentioning that 125,766 tons of ore were extracted during the past year, he remarks: " In view of the unfavourable developments, this is on a greater scale than it can be expected to do in the future." The ore reserves in the five mines are stated to be 350,000 tons, and as 220,000 tons are mined annually, the tonnage in sight will keep the plant running eighteen months. A change in the management has been effected, and it is probable that under the technical supervision of Mr. Noel Griffin, a reduction in working costs will be made.

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The report of the Antelope Gold Mine (Rhodesia), Ltd., for the year 1911 states that the property of the company now consists of 170 mining claims, situated in the West Gwanda district of Rhodesia, ten claims having been pegged during the year. The company also owns a farm of an area of about 6,000 acres, on which the claims are located. The ore reserves at December 31 amounted to 102,602 tons of 10·2 dwts and 6,217 tons of 8·3 dwts. value, which shows a considerable increase over the preceding year. Plans and specifications for a reduction plant capable of treating 4,000 tons a month have been prepared, and the erection will be proceeded with as soon as the plant is delivered on the property.

* * * *

The annual meeting of the Rhodesia Consolidated was held in London on Friday. Major Frank Johnson, presiding, referred to the question of the future of the Falcon Mines, in which Rhodesia Consolidated are largely interested. He said the directors of the company intended to offer to shareholders a quarter of a million sterling in 6 per cent. first mortgage debentures at par, convertible into shares at 35s. The following cable message from the Rhodesian office of the Falcon Mines was read in the course of the meeting:—" Shaft No. 9, No. 3 level east drive face looks well, value at 850 ft., £1 9s. 9d. No. 6 level east cross-cut No. 1 now in 92 ft. apparently through the reef, value over 90 ft. £3 0s. 6d.; reduced value £2 14s. 6d. No. 2 cross-cut in 10 ft. No payable values yet cut. Probably same horse as met with in No. 1 cross-cut. No. 6 level with cross-cut No. 1 through the reef, value over 15 ft. £2 8s. 6d. New main shaft now down to 50 ft. Ore reserves 30th June, 629,877 tons, value 46s. per ton. No tonnage included below level No. 5."

* * * *

The rails of the Kambove extension have been laid as far as the Lufira River. The earthworks are finished as far as thirty kilometers south of Kambove. This achievement is marvellous considering the difficulty which Messrs. Pauling and Co. and the sub-contractors have had in getting sufficient and good labour. It is quite possible that the new line will be handed over to the Chemin de fer du Katanga by the beginning of 1913.

WILLOUGHBY'S CONSOLIDATED CO.

Income Still Showing Expansion.—An Optimistic Note.

The result of the year's working of Willoughby's Consolidated Company has been to show a net profit of £56,980, which contrasts with £100,029 in 1910, £26,088 in 1909, and £10,112 in 1908. It must be borne in mind that a considerable portion of the profit earned in 1910 was due to the advantageous realisation of shareholdings, the market at that time being propitious. Such profits, of course, are almost entirely dependent upon active markets and must fluctuate from time to time. Gold sales from mines worked by the company and royalties on bullion obtained by tributers last year amounted to £53,926, a decrease of about £3,500 as compared with the previous year; profit on sale of mining interests and store trading was £22,569, an increase of just under £6,000; land and farms revenue, £22,766, was £8,789 better; and rents from town buildings and stands, at £6,550, shows an increase of £1,235. In addition to these items, £27,644 was derived from the realisation of investments, £1,302 from interest and dividends, and £1,279 from transfer fees and sundries. Altogether, the total receipts amounted to £136,037, as compared with £170,608 in 1910, and the expenses totalled £79,057, leaving a net profit, as stated above, of £56,980. Adding the amount brought forward from the previous year (after payment of dividends, etc.), there remains a total credit balance of £148,236, which it is proposed to deal with as follows:—To write off, in connection with the issue of 5 per cent. debentures, part of the purchase of the properties acquired from the Matabele Reefs Co., £37,739 2s.; to write off shares in subsidiary and other Rhodesian companies, £50,000; to write off buildings in Salisbury and Bulawayo, £6,000; to transfer to reserve account, £30 000. This will leave a balance to be carried forward of £24,496 19s. 8d. During the past year, 128,000 reserve shares were issued, at a premium of £17,692 12s. 6d., making a total of 1,377,745 shares issued at December 31, 1911, and since then a further 22,883 shares have been issued for cash, the issued capital now standing at £700,314, in 1,400,628 shares. On January 1, 1912, a further £9,100 of 6 per cent. debentures were redeemed at par, reducing this issue to £54,100. An issue of 5 per cent. debentures to the amount of £149,800 was, however, made during the year in connection with the purchase of the assets of the Matabele Reefs and Estates Co., this issue being repayable by annual drawings of 10 per cent., commencing on the redemption of the 6 per cent. debentures. The Matabele Reefs Co. being in liquidation, the Court required a cash offer for the properties, although arrangements had previously been made with the majority of the debenture holders of the Matabele Reefs Co. for payment in debentures. The cash offer was at the rate of 15s. in the £. The property and outlay account has been increased by the cost of the purchase of the property of the Matabele Reefs and Estates Co., and of the development and maintenance of the company's general assets. From this has been deducted the cost of mining and other assets sold during the year, the account now standing at £560,862 14s. 7d. According to a schedule of the company's properties, we find that in June, 1912, it held 1,304,471 acres of land, 6,484 head of cattle valued at £38,652, 757 town stands, 3,191 gold mining claims, 240 base metal claims, a 40 per cent. interest in the Sengwe coalfields and a 20 per cent. interest in the Tuli coalfields. These are, of course, in addition to its large shareholdings and investments. As regards the land holding, which includes some of the finest land in Rhodesia, 34,737 acres were sold during the year at satisfactory prices. The year's revenue from occupied lands amounted to £13,999, as compared with £8,864 in 1910, an increase of about 58 per cent. Very good progress was made during the year with the ranching operations of the company, which are rapidly becoming a source of considerable revenue. With regard to the company's mining interests, the Eileen Alannah Mining Co. was formed in November last, and of its total nominal capital of £500,000, £410,000 has been issued. There are 215,000 tons of ore developed and the erection of a reduction plant to treat 3,000 tons monthly is now under consideration. Recently the Connemara Mining Co. has been formed with a capital of £175,000, to take over and work 108 mining claims in the Gwelo district. It is estimated that about 90,000 tons of ore, valued at £160,000, have been developed above the first level, and good values are now being encountered at the second level. The directors conclude their report by stating that the general outlook and the prospects in Rhodesia continue to be most satisfactory. The position of the country remains thoroughly sound and little importance is attached to the recent temporary set-back, which is attributed partly to abnormal drought, which is, however, not expected to seriously affect the operations of Willoughby's Consolidated. The population continues to increase, land values are steadily improving, and the output of gold is on the upgrade.

Wanted a Partner.

An interest in Five Gold Mining Blocks on Eiffel Flats is offered in return for 100 feet of sinking on reef below water level. Lode is closely correlated, both geologically and mineralogically to well-known Motor, and is situated at head of same vlei.

Apply " PARTNER " c/o this office.

THE YEAR WITH THE RHODESIA CONSOLIDATED.*

Review of Mining Interests—Prospecting Zambesia.

In submitting the balance sheet and profit and loss account for the year ended September 30, 1911, and their report, which deals with the company's operations to June 30, 1912, the board of the Rhodesia Consolidated Company regret that the annual meeting, convened for August 1, has been delayed, and adds that, owing to the stagnation of the mining market, the period covered has been one of singular difficulty for a parent mining company, the result of the year's work showing a loss of £11,467. The following particulars appear as to the company's subsidiaries:—Falcon Mines, Limited: The developments on this mine are being continued with much success, the ore reserves being now estimated on a conservative basis at 600.000 tons. The designs for the smelter and concentrator—the latter to treat some 15,000 tons a month—are now being completed, and tenders will be called for with the least possible delay. Recent advice from the mine states that the No. 5 level east is now in 305 ft., and continues in excellent ore, the values for the last 25 ft. averaging 7·5 dwts. gold and 5·07 per cent. copper for the width carried. The cross-cuts Nos. 4 and 5 at the same level at present show respectively: 20 ft. wide averaging 9·7 dwts. gold and 4·22 per cent. copper; 35 ft. wide averaging 4·3 dwts. gold and 2.92 per cent. copper. The results at No. 6 level also continue excellent. A 4-compartment shaft has been laid out to cut the reef at about 860 ft. vertical, which will give some 1,000 ft. of backs. Asn Mine: This property, in which the Consolidated Company owns some 57 500 shares, comprises 257 claims adjoining the Kimberley Mines near Mazoe, and is on the railway linking that town with Salisbury. Since the inception of the Asn Gold Mining Co., Limited, the systematic development of the mine has been attended with very satisfactory results. Insiza Mines, Limited: During the past year considerable development was executed on a property which gave promise of recouping the loss entailed at the Nelly Mine; but the directors regret that so far the results have not been successful, although it is probable that a considerable portion of the expenditure on the property referred to, "The Slam," will be recovered in the form of royalty from the tributors. Rhodesia Mines Trust, Limited: The Consolidated Company is a large shareholder in this company, and also hold jointly with it the following interests:—An option of a concession carrying a large gold-bearing reef, known as Muende, N.E. of Tete, Portuguese East Africa. The reports show good widths and values in places, and a competent engineer, with a staff of miners, is now on the property and engaged in its development. An option in the same vicinity has been secured on what is described as a long and well-defined gold-copper lode outcrop, containing old workings of an unusually extensive character, known as the Makanga Barros. Active exploration of this property is also being taken in hand. A half interest is also held in an option on the Zarbolo, consisting of thirty claims in the Gwelo district. Headlands Copper Properties: The increase in the price of copper has added very materially to the value of these properties, and negotiations are now proceeding with a view to the provision of capital for their further development. Mining Claims, etc.: The Consolidated Company owns 815 claims and a one-third interest in a further sixty claims. At the same date the company was interested with others in options to purchase 160 claims, of which 100 have since been allowed to lapse, whilst of the remaining sixty claims on option, thirty have already been referred to above as the Zarbolo. During the year 15,502 acres were sold, at an average of 5s. 10d. per acre., the company's holding now amounting to 490.433 acres. The item of "Stands" remains without change, the stands consisting of twelve in Umtali, six in Victoria, six in Salisbury, and eight in Bulawayo—or in all thirty-two stands.

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*Authorised capital, £700,000 in 1.400.000 shares of 10s. each, of which 1,194,675 shares, equivalent to £597,337 10s., have been issued.

Transvaal G.M. Estates: A Quarter's Results

The directors' quarterly report for the three months ending the 30th June, 1912, states, *inter alia*:—General Expenses, European and head office, £3,114 2s. 7d.; debenture interest, £1,550; profit for the quarter, £66,479 19s. 8d.; total, £71,144 2s. 3d. Working profit for the quarter, brought down, viz.: Central mines, £63,213 8s. 3d., Elandsdrift Mine, £5,419 16s. 1d., Vaalhoek Mines, £760 8s. 11d. £69,393 13s. 3d.; sundry revenue, £840; interest, £910 9s.; total, £71,144 2s. 3d. Interim Appropriation Account (subject to amendment).—To funds transferred: Provision made during the quarter for repayment of £15,000 5 per cent. First Mortgage Debentures due 1st April, 1913, in terms of Debenture Trust Deed dated 4th April, 1910, £3,750; to Mining Taxation Act (1910), for three months, estimated, £5,791 8s. 0d.; to balance carried to balance sheet, £137,605 5s.; total, £147,146 13s. By balance brought forward from 31st March, 1912, £80,666 13s. 4d.; balance of working expenditure and revenue account, as above, £66,479 19s. 8d.; total, £147,146 13s. Capital Expenditure.—The capital expenditure for the quarter, which has been met out of the proceeds of the debenture issue, has amounted to £8,390 12s. 8d., and is made up as follows: Central Mines, £7,650 10s. 10d.; Elandsdrift Mine, £305 1s. 6d.; Wattle plantations, £435 0s. 4d.; total, £8,390 12s. 8d. Central Mines.—Number of feet driven, sunk and risen, exclusive of stopes, 11,007 feet; ore received from mine, 33,573 tons; tonnage crushed, 33,650 tons; number of stamps operating, 60 stamps; number of tube mills operating, 2 tube mills; value of ore before crushing (calculated at 84s. per fine oz.), mill yield per ton, 30s. 9d., assay value of pulp, 34s. 7d.—65s. 4d.; total yield, 24.708.193 ozs.; total yield per ton, 14.685 dwts. Elandsdrift Mine.—Number of feet driven, sunk and risen, exclusive of stopes, 254 feet; ore received from mine, 1,894 tons; tonnage crushed, 1,899 tons; number of stamps operating, 5 stamps; value of ore before crushing (calculated at 84s. per fine oz.), mill yield per ton, 73s. 1d., value of pulp based on the recovery, 14s. 6d.—87s. 7d.; total yield, 1,974.553 ozs.; total yield per ton, 20.795 dwts. Vaalhoek Mine.—Number of feet driven, sunk and risen, exclusive of stopes, 555 feet; ore received from mine, 3,874 tons; tonnage crushed, 3,921 tons; number of stamps operating, 10 stamps; value of ore before crushing (calculated at 84s. per fine oz.), mill yield per ton 12s. 11d., value of pulp based on the recovery, 17s. 10d.—30s. 9d.; total yield, 1,162.991 ozs.; total yield per ton, 5,932 dwts. General.—The poorest ore has now been extracted from the Clewer Mine, the ore still remaining to be mined is of somewhat better value. The results of development operations at the Central Mines, which continued to be fairly satisfactory during the first two months of the quarter, have improved considerably during the month of June. The connection of Dukes Hill Channel with the Company's farm Ponieskrantz has been successfully accomplished, thus rendering this valuable part of the property independent of the Morgenzon Concession as regards access. The erection of a small compressor plant at Peach Tree Mine has now been completed and should facilitate development operations at this mine. The extension of the slimes plant will soon be finished. With this plant in full running order, it will be possible to treat 13,000 tons a month at the Central Works, provided sufficient labour is available. At Elandsdrift the quartz "blow," which is the main feature of the mine, continues to open up and yield the usual satisfactory values, but in the dip section development operations are handicapped by water. The erection of the new power plant, which will permit of adequate pumping facilities being provided for this mine, is proceeding satisfactorily. At Vaalhoek, the results of development continue to be unsatisfactory, but the results of mining operations show a slight improvement. Ore on Hand.—The system of taking credit in the working accounts for "ore on hand" has been discontinued, and the values as at 31st March, 1912, have been taken out of the accounts during the present quarter. The tonnages on hand as at 30th June, were as follows: Central Mines, 2,953 tons; Elandsdrift Mine, 497 tons. Debenture Redemption Fund.—In terms of this company's debenture trust deed, dated 4th April, 1910, £15.000 are repayable on 1st April, 1913, and due allowance has been made in the foregoing accounts for the proportion due for the quarter ending 30th June, 1912.

Specimen copies of the *S.A. Mining Journal* can be had from our new offices at 125, Salisbury House, London Wall, E.C.

THE CHAMBER OF MINES AND INDUSTRIAL QUESTIONS.

Review of Recent Matters Affecting the Mines.

The report of the Executive Committee of the Transvaal Chamber of Mines, presented at the monthly meeting on Thursday, contains the following:—*Finance.*—During July the disbursements amounted to £2,292 14s. 8d., and the receipts, including £852 17s. 11d. contributions received on account of the Transvaal Miners' Phthisis Sanatorium and £5,000 transferred from fixed deposit to current account, to £6,476 15s. 4d. The sum of £10,000 remains on fixed deposit. *Native Labour.*—The returns supplied by the Witwatersrand Native Labour Association, Limited, show the following results for the month of July:—Number of natives employed by members of the Association on last day of month, including natives in the service of mine contractors, but excluding natives in the employ of members of the Association in the districts of Barberton, Breyten, Rooiberg, and Louis Moore:

	June.	July.
On gold mines	188,494	182,935
On coal mines	8,549	8,497
On diamond mines	15,530	15,834
Totals	212,573	207,256

RECRUITING RESULTS.

The Witwatersrand Native Labour Association also furnishes the following information with regard to the natives recruited by the Association and its members during the month of July, 1912, and the districts whence they were obtained. These figures do not include natives recruited by mine contractors. The corresponding figures for the month of June are given for the purpose of comparison:—

	June.	July.
East Coast—South of latitude 22 deg. S.	2,250	2,521
East Coast—North of latitude 22 deg. S.	—	—
Cape Province	4,126	3,913
Transvaal Province	1,031	807
Basutoland and Orange Free State Province	1,224	1,473
Bechuanaland	229	169
Natal Province	1,262	510
Swaziland	942	260
Rhodesia (including via Pietersburg) ...	229	130
Local	6,616	6,458
	17,909	16,241

The monthly report issued by the Department of Native Affairs shows that at the 30th June, 1912, 318,465 natives were employed in labour districts of the Transvaal. Of this number, 226,758 were engaged on mines and on the various classes of works specified in Part I. of the Coloured Labourers' Health Regulations, 1906, and 91,707 were in other employ. From reports of native cases tried before magistrates in Johannesburg and Reef Municipalities, there appears to be a number of organised native criminals at various parts of the Witwatersrand. In consequence your Executive Committee requested the mining groups to instruct the managers of companies to exercise due supervision in the issue of permits to natives in their employ. In response to an enquiry made, the Minister for Native Affairs has informed the Chamber that the Government does not propose at present to increase the amount authorised to be paid as an advance under the provisions of Act No. 15 of 1911, namely, the sum of £2 under clause 24 of Schedule 1 of the Act.

MINERS' PHTHISIS ACT, 1912.

The regulations made by the Governor-General under Section 35 of this Act were published in the *Union Gazette* of the 30th July. These deal mainly with the duties of the Miners' Phthisis Board, appointed in terms of Section 3 of the Act. A list of the mines in the Union wherein the mineral dust produced by mining operations is, in the opinion of the Minister of Mines, of such a nature as to cause miners' phthisis, has also been published under Section 2 of the Act.

STAMP DUTIES AND FEES ACT.

The Commissioner for Inland Revenue pointed out to the Chamber that every grant of a proxy to vote at a meeting, whether executed outside or within the Union, is required to be stamped with a penny Union stamp under Item 20 (1) of the tariff of stamp duties contained in the second schedule of the Act; and that the stamp of the country of execution (outside the Union) is of no validity in South Africa. The attention of secretaries to the mining companies has been specially directed to this provision.

SMALL HOLDINGS COMMISSION.

Since the date of the last report the Governor-General has appointed a Commission to inquire into and report on, *inter alia* (1) The necessity for providing land in or near mining and industrial centres within the mining districts of Johannesburg, Boksburg, and Krugersdorp, in the Transvaal Province, for establishing small holdings and for the settlement thereon of persons engaged in mining or industrial occupations. (2) The extent of land available for effective occupation, and in connection therewith. (3) The legislative changes, if any, for carrying out any scheme found to be necessary. This subject is receiving the consideration of a sub-committee of your Executive Committee.

Knight Central.

The quarterly report for the three months ended the 30th of June at the Knight Central shows that from 71,316 tons milled 20,579.081 ounces of gold were recovered, the estimated revenue from which is £86,199. The total costs were £70,528, or 19s. 9.37d. per ton, which left a profit for the quarter of £15,671, or 4s. 74d. per ton. Capital expenditure during the three months was £8,391. The east shaft has been sunk 97 feet to a total depth of 4,227 feet, viz., to the 15th level. Sixty feet sills have been put in to a depth of 4,143 feet. The west shaft, which is now in a hard dyke, has been sunk 91 feet to a total depth of 4,089½ feet, or to 156 feet below the 13th level, and 95 feet of sills have been put in to a depth of 3,975 feet. Stations have been cut at the 12th and 13th levels; the first-named has been timbered and equipped with a waste rock box. The development footage was 2,502 feet. Exclusive of main cross-cuts, ore passes and prospecting work, 1,784½ feet, of 76.9 per cent. of the development work has been on reef. Altogether 1,800 feet have been sampled, the average value being 5.66 dwts. over 55.12 inches. The total comprises 850 feet, or 47.2 per cent., averaging 2.20 dwts. over 52.52 inches and 950 feet or 52.8 per cent., averaging 8.49 dwts. over an estimated stoping width of 57.44 inches. In this latter total is included 275 feet of Main Reef at 9.42 dwts. over 61.29 inches, 35 feet of Main Reef Leader at 8.98 dwts. over 41 inches, and 650 feet of South Reef at 8.04 dwts. over 56.68 inches. The ore reserves have been re-calculated, with the following result: Payable ore exposed as at March 31, 623,300 tons at 6.04 dwts. over 60.55 inches. Payable ore exposed or developed during quarter ended June 30, 89,220 tons, making a total of 712,520 tons, which, less ore mined from payable blocks during quarter ended June 30, 54,520 tons, makes total ore reserves at June 30, 658,000 tons at 6.05 dwts. over 60.77 inches. This reserve comprises: 277,500 tons on Main Reef, at 6.15 dwts. over 63.32 inches; 373,400 tons on South Reef, at 5.93 dwts. over 59.59 inches; 7,100 tons on Main Reef Leader, at 8.49 dwts. over 39.74 inches; making a total of 658,000 tons, averaging 6.05 dwts. over 60.77 inches. On construction work extensions have been made to the change room for natives at the west shaft, several small jobs which have been standing in abeyance have been finished off, and additions and improvements have been made in connection with the mine ventilation and the surface fire service.

Good finds are reported from Droogveld on the property of the Vaal River Estates.

THE WEEK IN THE SHAREMARKET.

Firmer with Increased Business—Improving Outlook.

THE week has witnessed a notable increase in business and an all-round improvement in quotations. A new feeling of hope and cheerfulness has pervaded the market, and the outlook seems favourable to increasing activity at higher levels. Reasons for optimism exist in the excellent returns from all the mines in the Modder district, in the brighter prospects of native labour, and in the more sympathetic attitude of the Minister of Mines towards the industry, as exemplified in his refusing to lend support to the recent agitation on the wages question. Mr. Elkan's speech at the Chamber of Mines meeting on Thursday contained some important estimates of the savings rendered possible to the mines by the reduction in railway rates. Generally, therefore, the outlook is brighter. It is true that some stocks, such as Main Reef Wests, were largely sold on rumours of a dyke having been struck, but this is a not infrequent occurrence on the Rand, and there is nothing in it to warrant the selling of shares in a property that has been showing good development results during the past six months. Tin and diamond stocks remain quiet, but firmer.

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According to London advices, in Rhodesians price movements were of a minor character. Several interesting items of news were published, but they proved wholly without effect. During June the gold output from all the mines in Rhodesia showed a decline of £7,540, in spite of the fact that there was an additional producer. June was, of course, a short month; so that the daily production appears to have been pretty steady. The Willoughby's Consolidated report makes rather a disappointing showing, the credit balance being little more than half the figure for the preceding year, and no dividend is forthcoming. Market conditions in 1911, which rendered the sale of investments impossible, have to be held accountable for this state of things. The annual report of the Eldorado Company was issued in mail week, and gave the market rather a shock, seeing that the total and value of the mine's ore reserves both show a reduction of approximately 25 per cent. Apparently the reef has faulted badly on the 8th level, and until there has been time for further development the outlook will naturally be regarded with some anxiety. News has been received from the Star of the Congo Mine to the effect that the damage to the smelters is being repaired rapidly, and this has had a steadying effect on Tanganyikas.

* * * *

	Friday, 9th	Sat., 10th.	Monday, 12th	Tuesday, 13th	Wed., 14th.	Thurs. 15th.
African Farms ...	15 9B	16 6	16 9	16 3B	16 3	15 9
African-European In.	...	11 0S	...	...	...	...
Adair-Usher Process	1 6S	...	...	1 6S	..	1 9S
Apex Mines ...	28 0B	28 6B	29 0B	...	28 6B	28 0B
Bautjes Consolidated	21 0	21 3B	21 6B	21 6B	22 0B	21 5B
Benonis	4 9B	4 10B	3 0B	4 9B	4 9B	4 6B
Bushveld Tins ...	...	1 0B	...	...	1 2S	1 0S
Brakpan Mines ...	76 6	77 0	77 0B	77 0	76 6B	76 6S
British S A. ...	27 0B	28 3B	...	28 6B	29 0B	28 3B
Cinderella Cons. ...	21 6B	22 0B	21 6B	...	23 0B	..
City and Suburban ...	47 3B	48 0B	48 0B	48 0B	48 0B	48 0
City Deeps	57 6B	59 6	60 0	60 0B	60 6B	58 0B
Cloverfield Mines ...	5 10B	6 3	6 10	6 3B	6 6	6 0
Cons. Langlaagtes ...	24 9	24 9	24 9B	24 9	25 6	24 9
Cons. Main Reefs ...	19 6B	19 9B	20 3	20 0	20 0	19 9
Coronation Freeholds	0 6B	0 6B	...	0 9S	...	0 6B
Concrete Cons. ...	7 6	5 0B	6 0B	...	...	...
Cons. Mine Selections	..	12 0B	12 0B	...	...	...
Con. Investment ..	20 0B	21 0B	21 3B	...	21 3B	...
Crown Mines	135 0B	135 0B	135 0B	135 0B	135 0B	...
Coronation Colls. ...	12 0B	12 0B	...	...	...	15 0B

B Buyers. S Sellers.

	Friday, 9th.	Sat., 10th	Monday, 12th.	Tuesday, 13th.	Wed., 14th.	Thurs. 15th.
East Rand Cent. ...	11 6	12 9	13 9	13 0S	12 6B	12 0
East Rand Coals ...	2 5B	2 5B	2 6	2 5	2 5B	2 4
East Rand Deeps ...	2 1B	2 2	2 6	2 9	2 9	2 6
East Rand Props. ..	59 0	59 3B	60 0	57 0B	58 9	56 0B
East Rand Deb. ...	£93	£92	£92	£92	£92	£92
Eastern Gold Mines	1 10	1 11	2 1	2 1	2 2B	2 0B
Frank Smith Diam...	8 9B	8 9B	8 9B	...	8 6B	8 0B
French Rands ...	1 0S	...	...	1 3B	...	1 9B
Govt. Areas	25 6	26 3	26 6	26 6	25 9	25 0
Glynn's Lydenburgs	26 0	26 6B	26 6B	26 6B	27 0	26 0
Glencairns	4 0B	4 0B	4 0B	4 0B	...	4 0B
Glencoe (Natal) Colls	6 0B	6 0B	6 0B	6 0B	..	6 0B
Geduld Props. ...	23 6B	24 9	25 0B	25 0B	25 0B	...
Jumpers	...	7 6B	...	...	...	...
Jupiters	10 9B	11 3	11 6B	11 6	11 0B	10 6
Kaalfontein Diamonds	0 5B	...	...	0 4B	0 5B	...
Klerksdorp Props. ...	3 0B	3 1	3 3B	3 2B	3 2B	3 4S
Knight Centrals ...	13 9	14 3	15 0	14 6B	14 6B	14 3
Luipaardsvlei Estates	8 9B	8 0B	9 0B	8 6B	8 6B	8 3B
Lace Props.	3 6B	3 11	4 3	4 3	4 6	4 4
Lydenburg Gold Farms	2 6B	2 7B	2 7B	2 8	2 9B	2 6B
Main Reef Wests ...	25 3	26 0	26 0B	25 6	24 0B	23 6
M.R. West Deben...	£98	£98	£98	£99½	..	...
Modder B's	64 3	66 6	66 6	67 0B	68 3	36 9B
Middelvlei Estates...	1 7B	1 9	...	...	1 7B	1 7B
Modder Deeps ...	34 6	34 0B	35 0	34 3	34 0B	32 6B
Meyer & Charltons...	...	...	...	88 6B	90 0B	...
New Eras	7 6B	7 9B	8 0	...	7 6B	7 6B
New Kleinfonteins...	26 0B	26 3B	27 0	26 6B	27 0B	...
New Rietfonteins ...	7 9B	8 0B	8 0B	8 0S	8 0S	8 0S
New Unifieds ...	17 0S	...	...	...	17 0B	17 0S
New Boksburgs ...	1 9B	2 0S	...	2 0S	1 9B	1 9B
Nigels	15 0B	16 0B	16 0B	16 0B	17 0B	17 0B
Orange Diamonds ..	1 7B	...	1 7B	...	...	1 3B
Premiers Deferred	196 3B	205 0B	207 6B	177 6	212 6B	210 0B
Pigg's Peaks ...	12 0B	12 0B	...	12 0B	12 0B	12 0B
Pretoria Cement Co.	51 0B	50 6B	50 0B	51 0B	51 6	51 0B
Pretoria Estates ...	17 6S	...	...	...	...	...
Paardekraal Estates	...	0 6B	0 6B	...	..	1 0B
Potchefstroom Est....	2 0S	1 0B	1 3B	...	1 3B	2 0S
Princess	9 9B	9 9B	9 9B	...	10 0S	9 9B
Rand Nucleus ...	3 0B	3 0B	3 3	3 6B	3 5B	3 3
Randfontein Estates	28 0B	29 6	29 9	28 9	28 9	27 6B
Randfontein Deeps...	4 6B	5 0	4 6B	5 0S	4 6B	4 6
Rooiberg Minerals ...	29 3	29 6B	30 3B	31 3B	31 0B	30 9
Rand Klips	4 9B	4 10	4 9B	5 0	4 5	3 9B
Ryan Nigels ...	3 9B	3 9B	3 9B	3 9B	3 9B	3 9B
Roberts Victors ...	15 0B	15 0B	...	...	15 0B	15 0B
Simmer Deeps ...	...	2 6S	2 6B	2 6B	2 9B	2 6B
South African Lands	4 2	4 4	4 9	4 6	4 7	4 4B
S. Randfontein Deeps	3 6	4 3	...	4 3S	3 9B	...
Sub Nigels	5 9B	6 0	6 0B	6 3B	6 3B	...
Springs Mines ...	16 3B	16 9B	16 6B	16 3B	...	...
S. A. Breweries ...	38 6B	..	...	38 6B	40 0S	...
Trans. G.M. Estates	46 6B	47 0B	47 0B	47 0B	47 0B	47 0
Temple Tins	4 3B	4 0B	4 3	...	...	4 0B
Trans. Coal Trusts...	45 6	47 3	47 0	47 0	47 0	45 3B
Tudors	1 4B	1 4B	1 7B	...	...	1 3B
Van Ryn Deeps ...	18 6	19 3	19 9	19 0	19 0	18 3
Village Deeps ...	40 0B	41 0B	...	41 3B	...	40 0
Vogel. Cons. Deeps...	1 0B	...	1 3B	1 3B	1 0B	...
Voorspoed Diamonds	10 0B	10 0B	10 0B	10 0B	...	10 0B
Van Dyks	...	2 0B	2 0	2 6B	2 0B	2 0B
Witwatersrands ...	50 0B	55 0B	55 0B	...	...	54 0B
Wolhuters	21 3B	21 9	21 9B	21 0B	21 3B	21 0B
Witbank Collieries...	45 0B	45 6	45 0B	...	45 0B	45 0B
Wit. Deeps	...	54 0B	55 0	54 6B	53 3B	52 3
West Rand Est. ...	...	...	2 6B	2 6B	2 9B	2 9B
West Rand Con. ...	11 6B	12 3B	12 9B	12 9B	13 0	...
Wit Townships ...	...	24 0B	25 0B	26 0B	25 0B	...
Zaaiplaats	36 6	37 0	37 3B	38 3	37 6B	37 6

B Buyers. S Sellers.

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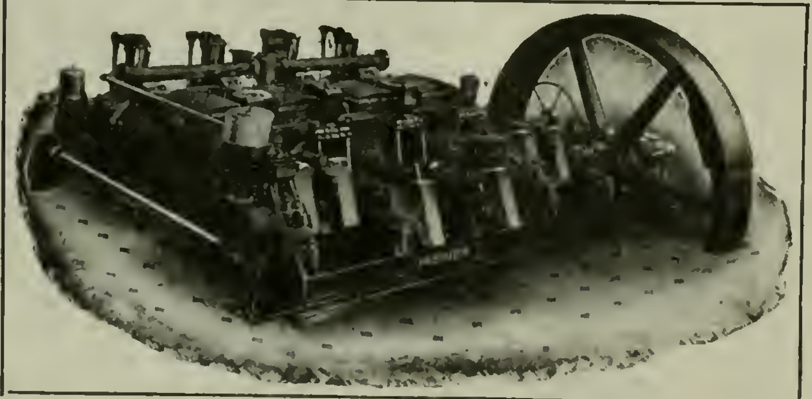

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Engineering Notes and News.

Royal Appreciation.

Messrs. Cradock, of Wakefield, have received the following letter from the Private Secretary to their Majesties:

"The King and Queen are anxious to assure you and all concerned what a pleasure and interest it was to their Majesties to visit your manufactory, and to see your employees at their daily work; and the hearty welcome given by them to the King and Queen was most gratifying. I am commanded to thank you for the excellent arrangements, which you so kindly made for their Majesties' reception.

"The Manager,
"Messrs. Cradock's Roperies, Wakefield,
"July 13th, 1912."

Tests of Wire Rope.

The United States Bureau of Standards has decided to make a series of tests upon wire rope and desires the co-operation of the manufacturers, engineers and users of this material. They are invited to state just what tests should be included, in their opinion, and also to give suggestions as to the conduct of the tests. Some of the points that naturally suggest themselves are as follows:—(1) What should be proposed as a standard tensile test? (a) Proper length of specimen, taking account of that critical length over and above which the strands will act as a unit. (b) Type of end sockets or connection. (c) Elongation, etc. (2) What importance should attach to the torsion test? (Some authorities believe this to be superfluous) and what should be a standard test for torsion? (3) What is suggested in the way of cold bend test over the usual methods. (4) Little has been published in the matter of impact tests. It would seem as if this field is important and recommendations are desirable. (5) What should be done in the matter of abrasive tests? (6) Biggart, Stone and others have proposed and made tests in which the life of cables, and other properties, are investigated by passing them over a series of pulleys direct and reversed, the cables being subject to different direct tensions. What is the relative value of such tests, and how should they be carried out? (7) Samples of cables have been taken under actual service conditions after a number of years' usage in mine or elevator service, and tests compared with the unused original material. Is anything in this line desirable? (8) Are any other physical tests necessary? (9) Chemical tests will be made. What are the suggestions in this respect? (10) What number of duplicate tests is suggested for any one type or specimen? Tetmajer used two in his tests. Three would seem more desirable. For the individual wires he used eleven. Would not a lesser number, say six, be sufficient? The Bureau asks for an expression of opinion as to what portion of the abovementioned points as they relate to tests shall have weight, also for any other features that will naturally occur from experience. In any future publications made, appropriate credit for individual ideas will be given.

"Tyisa" Sticks.

With the advent of the new year it will be necessary for all miners to use "approved" Tyisa, or "Cheesa," sticks when lighting up for blasting. When the law comes into operation it will be necessary for "approved" sticks to fulfil the following requirements:—(a) Must fire off no nitrous or carbon monoxide fumes or other poisonous gases; (b) be practically unextinguishable; (c) burn with a good light; (d) stand fairly rough handling and be impervious to dampness, and (e) must burn up to four minutes, and be non-explosive. The above "musts" form a minimum as a basis for a good Tyisa stick, and all these qualities are combined in Gumpold's Tyisa Sticks, which are being supplied to the mines by Messrs. Shimwell Bros., who have the sole agency for the Rand. The price is right and the article of the best, and those mines wishing to satisfy themselves as to the merits of this stick should place a sample order, or ring up Messrs. Shimwell Bros. ('phone 2878), when their representative will be pleased to bring out samples for demonstrating purposes. They claim that there is no stick other than Gumpold's that fulfils the maximum of requirements. Send for a sample order and judge for yourselves.

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RAILLESS ELECTRIC TRACTORS.

The System to be Adopted in South Africa—Low Cost and Great Flexibility—Other Advantages of the "Trackless" Method.

Railless electric traction is a comparatively new method of locomotion in England, although on the Continent a number of lines have been in successful operation for some years. In 1909 the first experimental "railless" line was constructed at the Hendon depot of the Metropolitan Electric Tramways. From this has been elaborated the Railless Electric Traction Company's system which has now been adopted at Leeds and Bradford. The line constructed at Leeds is about four miles in length, and the route is one of considerable variety, and presents all the conditions met with both in urban and rural localities. At Bradford the railless system forms a connection between two tramway routes, and is 1¼ miles in length. At Leeds the railless vehicles use the same positive wires as the tramway over a section of the route. In fact, it is a feature of the railless equipment, as installed at Leeds and Bradford, that the omnibuses can be driven over any tramway route. When this is done, there being no negative wire, the return is made to the rail by means of a skate hinged to the chassis. Other cities in the United Kingdom have adopted and are considering the adoption of these trackless vehicles. For instance, at Edinburgh it is proposed to instal the railless 'buses to connect up distant points on the tramway system proper.

A Railless Tractor Passing a Wagon in Bradford.

Adoption in South Africa.

It occurs to one that the Johannesburg Tramways might well employ these vehicles over some, as yet, unlinked-up portions of the municipal area. For instance, the northern circular route, that has so often been spoken of, could be completed at comparatively low cost by employing railless electric traction between the Rosebank and Norwood termini. On account of the much less initial cost of the railless electric traction system (it is estimated that the "trackless" costs only about one quarter of the more usual rail installations), and because of its flexibility, the "R.E.T." method is likely to be of special value to South Africa. That its advantages are recognised here may be gained from the facts that Mr. Thomas, the general manager of the Durban Tramways, has advocated the use of railless traction in Bloemfontein, that Germiston is to be served in this manner, and that the municipalities of Boksburg, Benoni and Krugersdorp are carefully investigating the method. There are many other towns in South Africa where the "R.E.T." system could seemingly be used with great advantage. Where the municipalities are not sufficiently wealthy to lay rails, trackless trams could very well be employed. The majority of South African towns are possessed of good, broad streets, and whether span wires right across the road (as, it is understood, will be used at Boksburg) or "brackets" (as are to be erected on the Germiston system) are employed, the "R.E.T." vehicles will be able to turn and twist in and out of the traffic without inconvenience or trouble. The accompanying photograph shows a railless tractor passing a loaded vehicle at Bradford. Bulawayo, with its wide roads and avenue, suggests itself as one town to which the railless trams should be particularly beneficial, and here, as in many other cases, the question of first cost is of overwhelming importance.

Many Advantages

Special features of interest and importance in connection with the "R.E.T." system over and above its conspicuous advantages in regard to capital outlay and flexibility, are that the "R.E.T." system is of British manufacture throughout, that it is the only system of its kind in use in the United Kingdom, that it is the only system that uses the overhead equipment of standard tramway type, and the only system that employs standard tramway trolley heads. Amongst other uses and advantages claimed for the "R.E.T." system the following are noteworthy:—The "R.E.T." is the only system on which cars can travel at full speed on any part of the roadway without side-pressure on the trolley wires. The "R.E.T." system ensures complete freedom for crossings, junctions, and inter-running between tramcars and railless cars operating in the same town. The "R.E.T." system enables passengers and merchandise to be carried over existing tramway routes without alteration of the overhead wires. The "R.E.T." system enables branch lines to be constructed from main routes into factories, warehouses, docks, canal wharves, railway stations, etc., at a comparatively trifling cost. The special goods lorries and light road locomotives with trailer wagons can deal with large quantities of goods, minerals, agricultural produce, etc. The "R.E.T." cars are turned at the terminus of a line by means of a loop or "balloon end," which is a quite simple form of overhead construction. Where this arrangement is impracticable the cars can easily be turned in a street only twenty feet wide by using a side street near the terminus and constructing a "V" formation in the "outward" trolley wire, the apex of the "V" pointing down the side street, no frogs being necessary. In emergency the cars may be turned in the straight line at any part of a road 24 feet wide. The Light Railway Commissioners, in their report covering the year 1910, stated that railless traction schemes might appropriately, and perhaps with advantage, be brought within their powers. Subsequently they carefully inspected the "R.E.T." system in operation at Leeds and Bradford, and expressed their entire satisfaction with its working, and predicted for it a wide development. It is understood that the Commissioners will be authorised to deal with railless traction schemes so that powers to instal and operate lines on the "R.E.T." system will be more cheaply and quickly obtained. After carefully inspecting the "R.E.T." system in operation at Leeds and Bradford, the Colonial Premiers expressed their warmest admiration of it, one declaring it to be "*Just what the Colonies want.*" The "R.E.T." system has also been adopted by the Corporations of Rotherham and Dundee, and lines are projected or under consideration by Corporations and others, in many places in the United Kingdom, including Sheffield, Birmingham, Oldham, Manchester, Stockport, Hull, Middlesbrough, North Shields, Plymouth, Edinburgh, Leith, Glasgow, Aberdeen, Halifax, Northampton, Cardiff, Crewe and Southend; and in the London district in West Ham, Wanstead, Leyton, Ilford, Ealing, Chiswick, Tottenham, Southall to Twickenham, etc. A few words must be said in regard to flexibility and rapidity of construction. The railless car is not confined to a fixed and undeviable path, but can be steered with the greatest ease in and out of even congested traffic and pass obstructions and under very low bridges while deviating from the straight track with the same facility as any other type of mechanically-propelled road-vehicle. In this respect it is free from a drawback which, in the case of tramways, often reaches serious dimensions. There are many streets through which the progress of a tramcar is continuously impeded by tradesmen's carts standing at the roadside or by wagons to whose slow movement the tramcar is forced to accommodate itself. The breakdown or stoppage of one of the railless cars does not cause delay in or discontinuance of the service. The railless cars can be drawn up to the curb at either side of the road. Railless traction can, of course, be much more rapidly constructed than tramways. The delay and inconvenience caused by the laying and renewal of rails is avoided (obviously a point of the utmost importance in towns possessed of narrow streets and having a large volume of traffic), and the capital embarked in the enterprise becomes remunerative at a much earlier date.

The Question of Cost.

As to cost, close estimates of working expenses can be given only after an inspection of proposed routes has been made and a knowledge of local conditions has been acquired, but, in most districts, the working expenses of "R.E.T." cars having seating accommodation for 30 to 48 persons will be from 4d. to 5½d. per mile. Fixed charges may be taken as interest on capital and amortisation of loans, and are, therefore, in any particular case, proportional to the amount of capital expenditure. As a railless traction installation requires less than one-fourth of the capital needed for a tramway of the same length, the fixed charges, expressed as a charge per car-mile, will also be less than one-fourth of the fixed charges of a tramway designed for the same annual mileage over the same rout. A railless traction installation is much less costly to construct, and also cheaper to operate, than a tramway, and, therefore, can be adopted for routes on which a tramway would be unprofitable. Some actual figures as to the cost of the Leeds and Bradford equipments will prove of interest. The Leeds installation cost £1,246 per mile, against £1,654 for the Bradford system, the Bradford gradient being 1 in 15, against 1 in 22 at Leeds. According to a recent report by the city engineer of Edinburgh, the cheapest rail electric tram installation cost £14,000 per mile, whilst the cost of the railless system will not exceed £2,000.

Advantages of the System Demonstrated Locally.

The agent for the "R.E.T." Construction Company, Ltd., 56, Moorgate Street, London, in the Transvaal, Rhodesia, and Cape Colony is Mr. Herbert Ainsworth, of the Corner House. Anyone interested in this form of traction should correspond with Mr. Ainsworth. As showing the extreme flexibility of the system, Mr. Ainsworth is exhibiting a series of cinematograph films illustrating the working of the "R.E.T." method in England. The films are of exceptional interest, and demonstrate clearly and effectively the ease with which railless tractors are operated and manœuvred through traffic. The system is assured, we think, of a big future in the Union and Rhodesia.

Our Twenty-First Anniversary Number.

THE LAST WORD ON RAND MINING.

To commemorate the twenty-first anniversary of the founding of this journal, a special number, distinct from the ordinary weekly issue, will be issued at the end of this month. Fittingly to mark the occasion, the number will contain a comprehensive and concise account of the past history, achievements and present position of every gold mine on the Rand, illustrated and brought down to the latest possible date. It will review the industry generally as well as in its several technical aspects, and will include articles by experts on the chemical, mining and metallurgical progress and problems of the fields. A feature will be made of the personal side of the industry, and a section will be devoted to its technical and administrative leaders, enriched with portraits and other illustrations. Engineering on the Rand in all its phases, electricity, steam and air power will be treated, and the growth and progress of electric power supply will be exhaustively discussed. The gold mines of the outside districts and the tin, copper and coal industries of those districts will be dealt with thoroughly and at first hand. The great diamond industry of South Africa will have a section to itself, and here, as in the treatment of the base metal industries, the letterpress will be embellished with many striking and original illustrations. Mining in the Cape, Natal and Orange Free State Provinces will also be reviewed and the undoubtedly great mineral potentialities of those, as yet undeveloped, areas will be graphically set forth. German South-West Africa will find a place in the issue and a first-hand account of the diamonds, the copper and the tin mines of that promising field will be included. Moreover, the banks and other great financial institutions, the railways and harbours of the sub-continent will be adequately dealt with, and the whole problem of transportation as it affects the inland industrial centres will be reviewed. In this connection Capetown, Port Elizabeth, Durban, East London, Delagoa Bay and Beira will be separately and fully treated and their claims examined. Apart from mining, there will be a considerable section devoted to a description of the several subsidiary industries dependent on mining for a market. Chief among these will be cement, explosives, soap and candle-making, milling and the hundred and one activities that centre in the Rand. Rhodesia and Mozambique will be given a separate and extended treatment. The different mines will be described and illustrated, and the recent progress of the industry in those territories dealt with comprehensively and lucidly. In addition, the issue will contain a number of interesting and valuable contributions from leading men in the mining and financial world, many of whom have already sent their congratulations on the decision to issue a special commemorative number of the journal. Numerous letters received from past Rand engineers and mine managers, now resident in all parts of the world, contain offer of contributions. These will form a unique collection of valuable views and reminiscences, and will considerably enhance the interest of the volume. The work will consist of upwards of 350 pages, printed throughout on art paper. Prizes are offered to artists for the best design of a suitable and striking character, and particulars are given in another part of this issue of other valuable prizes to be awarded in connection with the number. It may be added that the work will be prepared, produced and printed in South Africa, and will aim to cover the whole field of mining in this country, and to prove a fitting monument to the great industry with which, from the beginning, the *South African Mining Journal* has been associated. The co-operation of everyone interested in the industry is being enlisted to make the venture a success, and already it promises to mark an advance on anything of its kind ever before attempted in South African illustrated journalism.

Finance, Commerce, and Industries.

Rhodesia Trading.

The report of the Rhodesia Trading Company, Ltd., for the eighteen months ended 31st March, 1912, presented to the meeting on 31st ulto., states that the year ended 30th September, 1911, was characterised by a general activity in Rhodesian trade, resulting in total sales (exclusive of agencies held by the company) amounting to £253,395. The volume of trade throughout Rhodesia slackened as the year proceeded, but, nevertheless, the company's sales for the six months ended on 31st March last reached the satisfactory total of £122,684. The net profit realised, after providing £7,425 for additional capital, is £12,991, and, in accordance with the scheme adopted by the shareholders in 1909, this amount is retained in the business for working capital.

* * * *

Railway Classification of Machinery.

The General Manager, S.A.R., recently intimated that it was proposed to publish a list of the different classes of machinery entitled to be carried at Tariff 2, and that the classification would be as follows:—Machines and machinery, c.o.h.p., not mechanical power driven, 1; machinery, mechanical power driven, and component parts thereof, c.o.h.p., undamageable, 2. Thereon the following suggestion was received from Messrs. Hubert Davies and Co., and was sent to the General Manager for his consideration:—"With regard to the proposed new wording, viz., 'Machinery, mechanical power driven,' it should be pointed out that such a classification does not provide for mechanical driving machinery, nor for electrical machinery, unless it be mechanically driven. A more comprehensive reading would be: 'Machinery, mechanical and electrical driving and driven, including that used for generating, storing and transmitting power of all kinds, also component parts thereof.'"

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Steamship Classification of Goods.

The South African Steam Conference advise the following alterations and additions in the classification of goods:—Three-ply wood, Capetown and Algoa Bay 25s., East London 30s., Natal 30s., Delagoa Bay 32s. 6d. Fencing, chestnut wood wired, Capetown and Algoa Bay 22s. 6d., East London 27s. 6d., Natal 27s. 6d., Delagoa Bay 30s. Paper, writing, uncut and in original mill wrappers, Capetown and Algoa Bay 30s., East London 37s. 6d., Natal 37s. 6d., Delagoa Bay 40s. Wired glass, as "glass window, common." Curacho, as "methylated spirit." Cast-iron coping, as "cast-iron guttering." Selenetic cement, as "plaster." Delete "Peper, printing (n.o.e.)" and substitute "Paper for printing only." Delete "Guttering and gutter pipes (n.o.e.)."

* * * *

Trade to Belgian Congo.

In reply to an application made to him for the establishment of a system of rebates of duty on imported goods sent to the Belgian Congo, the Natal Commissioner of Customs says he is prepared to recommend that such rebates should be granted under the following restrictions and conditions, which he regards as absolutely necessary for the due protection of the revenue, and upon which he will be glad to have the views of the Chamber of Commerce:—1, name of importer; 2, place whence goods imported; 3, name of country of growth, manufacture, or production; 4, particulars, nature, quantity, and original value; 5, description of packages; 6. original marks and numbers; 7, amount of duty paid; 8, date and place of payment of duty; 9, name and address of consignee; 10, route and mode of carriage; 11, examination of goods with original and forwarding invoices and forwarding entry by examining officer, who would have to give certificate of accuracy. The examination would have to take place before 9 a.m. or after 4.30 p.m.; 12, sealing of packages prior to despatch; 13, payment of expenses of examining officer by applicant; 14, receipt of declaration from consignee certified by Customs or other proper officer at destination that goods have duly arrived; 15, refund of duty actually paid.

* * * *

Wattle Bark.

In a reply to a letter from the S.A. Trades Commissioner's letter, in London, English manufacturers have sent the following:—"We are the largest makers of tannin extract plant, and have supplied the principal extract makers in this country and in all parts abroad. We now have pleasure in replying to the various points you raise, as follows:—(1) It would not be possible or advisable to convert all the bark into extract in South Africa, but we certainly think it would be profitable, and also an advantage, to have an extract factory at the site, as it would increase the demand for this extract if same was properly made and introduced amongst the tanners. (2) It would be cheaper in freight to ship it home in dry form, as per sample which we send you herewith, but it might be advisable to send it home in this form and in block form also to start with. (3) The percentage of tannin in the dry form should be as per sample we send you, and in block form it should not be less than 60 per cent. (4) A complete plant, including buildings and an electric light installation to treat 75 tons of wattle bark per week, would cost, approximately, ten thousand pounds sterling (£10,000), and packed and delivered F.A.S. Glasgow, or a plant to do double this quantity, that is, 150 tons of wattle bark per week, would cost, approximately, fifteen thousand pounds sterling (£15,000), packed and delivered F.A.S. Glasgow. We would recommend the smaller plant to start with: it could be designed so as to be increased to double its capacity later on. (5) In answer to this question, we were in treaty with a firm of extract makers lately who contemplated starting the manufacture of extract from mimosa bark in South Africa. They have postponed doing so, however, and are meantime getting supplies of the bark, with a view to testing the market for tannin extract made from this bark. From this we would assume that it would be greatly to the advantage of the wattle growers in South Africa to have a factory there producing the best quality of tannin extract, as this would create an increased demand both for the extract and the bark. The plants quoted for above would be designed to produce the extract in dry crystal form as per sample. If extract in block form only is required, the cost of the plants could be modified." The Trades Commissioner adds: "During the course of my inquiries, it was brought to my notice that numerous other products, such as woods, roots, pods, etc., have been received from other parts of the world and found to contain valuable tannin acids of commercial value. I would, therefore, be glad if the Chief Conservator of Forests or other persons in the various Provinces would send to me any specimens of roots, barks, woods, pods, etc., which, in their opinion, contain tannin properties, so that trade opinions and analyses could be obtained. Such specimens should be forwarded with full information as to its origin, the quantity available, its cost of production, whether it can be extensively cultivated, and any other information which would enable me to determine its commercial value."

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Commercial Congress.

The Management Committee of the Cape Town Chamber of Commerce recommends that the following draft resolutions be submitted for the consideration of the seventeenth annual Congress of Chambers of Commerce of South Africa, to be held at Pietermaritzburg on September 16, 17, and 18, viz.:—*Tacit Hypothecs.*—That, in the opinion of this Congress, legislation should be introduced by the Government dealing with the whole question of tacit hypothecs, and that such legislation should embody the recommendations made by the Capetown Chamber of Commerce. (*Vide* pages 64 and 66, fifty-first annual report of the Capetown Chamber of Commerce.) *Codification of Divergent Laws.*—That, in the opinion of this Congress, Government should press forward the introduction of legislation for the codification of the divergent laws of the Union, and in regard to the Bills dealing with the estates of deceased and insolvent persons introduced during the last session of the Union Parliament, urges the recommendations made by the Capetown Chamber of Commerce be adopted. (*Vide* page 46 to 64, fifty-first annual report of the Capetown Chamber of Commerce.) *Patents, Trade Marks, and Designs.*—That this Congress is of opinion that the several laws in force within the Union in respect of patents, trade marks, and designs should be codified, and supports the recommendations made by the Capetown Chamber of Commerce. (*Vide* pages 66 to 68, fifty-first annual report of the Capetown Chamber of Commerce.) *Public Holidays.*—That, in the opinion of this Congress, the fact that Courts of Justice and Banks observe days in the year as Public Holidays which are not provided for in the Public Holidays Act, occasions considerable inconvenience to the public, and recommends that legislation be introduced by the Government so that in the matter of Public Holidays, Courts of Justice and Banks be made to conform with the Public Holidays Acts. *Local Administration.*—That, in the opinion of this Congress, the present system of referring all administrative matters to Pretoria for decision leads to irritating delays and losses, and more responsibility should be entrusted to local officers to settle such matters on the spot.

* * * *

South Africa's Trade.

At the conclusion of the ordinary business at the meeting of the Capetown Chamber of Commerce, this week, the President (Mr. Jagger, M.L.A.) made a statement in reference to the trade returns of the Union for the past half-year. The figures were, he said, very satisfactory. The exports showed an increase over the corresponding half-year of 1911 of something like 12 per cent., whereas the imports, for merchandise only—taking away Government importations—showed a slight decrease. Altogether, taking the whole of the figures for imports and exports, there was an excess of exports over imports of £11,416,000, against £8,611,000 in the corresponding half-year of 1911, an increase of almost £3,000,000—to his mind, a very satisfactory state of affairs, and one that showed how the production of this country was increasing. Not only had the export trade increased, but there was also a remarkable fact which had been mentioned in the papers, in the form of a decrease in the imports of food products of about £203,000, or about 6 per cent., compared to the corresponding half-year in 1911. The figures in relation to exports were interesting. Gold had increased by 11·54 per cent. in value, while diamonds showed a decrease of 5·4 per cent. in quantity, and an increase in value of 8·65 per cent. The diamonds exported were sold at £1 19s. 8d. per carat, as compared with £1 14s. 6d. in the corresponding period of 1911. Wool had gone up by no less than 18·9 per cent. in value, and had increased by about 26 per cent. in weight. Ostrich feathers had increased in value by 14 per cent., and, on the other hand, the quantity increased by about 27 per cent. The value in 1911 was £3 0s. 10d. per lb., as against £2 14s. 7d. in 1912. Hides and skins increased by about 29 per cent. in value, while the quantities increased to about the same extent. Coal had gone up in value by 13·4 per cent., and had only increased by 7 per cent. so far as quantity was concerned. Mohair increased in value by 26·8 per cent., and in quantity by about 45 per cent. Copper ore showed exportations during the past half-year of £103,995, as against £301,715 in 1911, showing a drop of 65½ per cent. in value, and in quantity of 67 per cent. Maize showed an increase in quantity of 35½ per cent., and in value of 89·3 per cent. Bark had gone up in value by 14·2 per cent., and in quantity by 21 per cent. Tin ore, strange to say, had dropped by 14 per cent. in value. Fresh fruit had increased in value by 30½ per cent. Whale oil showed an enormous increase from £3,718 in the first half of 1911 to £46,906 in the first half of this year, while the quantity had increased from 75,619 gallons in 1911 to 784,000 gallons in the first half of the present year. He went on to say that calabashes had also increased by about 13 per cent.; fodder and forage by over 100 per cent.; wines also showed a slight increase, also tobacco; and grain and meal showed an increase of 29 per cent. "I just mention these figures," proceeded Mr. Jagger, "to show how the productions of this country have increased, to my mind, at a very satisfactory rate. And then, furthermore, to my mind, the trade of this country is in a very satisfactory condition; a very sound condition. I think, at the present moment, the figures show very clearly the very sound position of trade in this country."

A new company, called James Spicer and Sons (South Africa), was registered on July 19, with a capital of £15,000 in £10 shares, to take over the stock-in-trade and movable effects of the South African branch of the business of wholesale stationers, etc., carried on by James Spicer and Sons, Limited. Private company. The number of directors is not to be less than three nor more than nine; the first are—J. Spicer, H. Spicer, C. E. Spicer, A. D. Spicer, E. Spicer, Sir Albert Spicer, P.C., Bart., M.P., J. L. Spicer, and D. Spicer. Registered office: 50, Upper Thames Street, E.C.

New Patents.

388. James Arthur Hart and Frederick Arthur Dudley Moseley.—Improvements in and in connection with devices for burning paraffin wax or the like for illuminating or other purposes.
389. Harry Smith.—The combined frame collar yoke harness.
390. Harry Phillips.—Improvements in means for stopping runaway skips and the like.
391. George Green.—Improvements in drills or bits for rock-drilling.
392. William Bowie Stevenson.—Improvements in or relating to jockeys for mechanical haulage.
393. Arthur Leonard Oldridge.—Improvements in atomizers or spraying devices.
394. Thomas Henry Chad.—Improvements in fuse lighters applicable also for other similar purposes.
395. John Edward Stone.—Improvements in means for securing pulleys upon their shafts.
396. Theodore Reunert.—Improvements in mortar boxes.
397. Friederich Carl Reiseberg.—Apparatus for externally treating animals with liquid.
398. Percy George Tacchi.—Improvements in or relating to internal combustion engines.
399. Peter Diedrich Heinrich Ohlhaver.—A process of maintaining the vitality of dried yeast.
400. Edwin Herbert Broden and James Goodfellow Mustin.—Improvements in and relating to collapsible reels.
401. Edwin Herbert Broden and James Goodfellow Mustin.—Improvements in and relating to metallic reels.
402.—Edwin Herbert Broden and James Goodfellow Mustin.—Improvements in and relating to reels.
403. Alexander Schweitzer and Fritz Hauff.—Improvements in the manufacture of nitrogen compounds.
404. Hans Goldschmidt and Walter Brewitt.—A method of uniting the ends of rails and other metal bodies by means of heat.
405. Charles Luther McKesson and Benjamin Frank Rice.—Method and apparatus for grading or sizing solid materials.
406. Guy Aubrey Chalkley.—Improvements in percussive rock-drilling tools.
407. Herbert Edmund Sherwood.—Combined grill and bicycle stand or support.
408. William Daly.—Improvements in stamp stem guides.
409. William Daly.—Improvements in stamps.
410. William Daly.—Improvements in stamp tappets.
411. Charles Legward.—Improvements in means for transferring comminuted solid matter from one liquid to another.
412. Thomas Anderson and Francis Ernest Dunnett.—Improvements in the recovery of gold from refractory ores and sands.
413. John Pountney Udal.—Improvements in drill or jumper extractors.
414. James Snodgrass.—Improvements in the manufacture of carbonate of soda.

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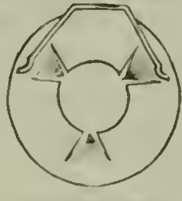

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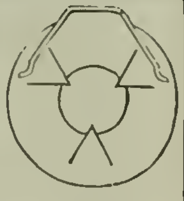

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Automobile Notes.

Results of Park Trophy Competition.

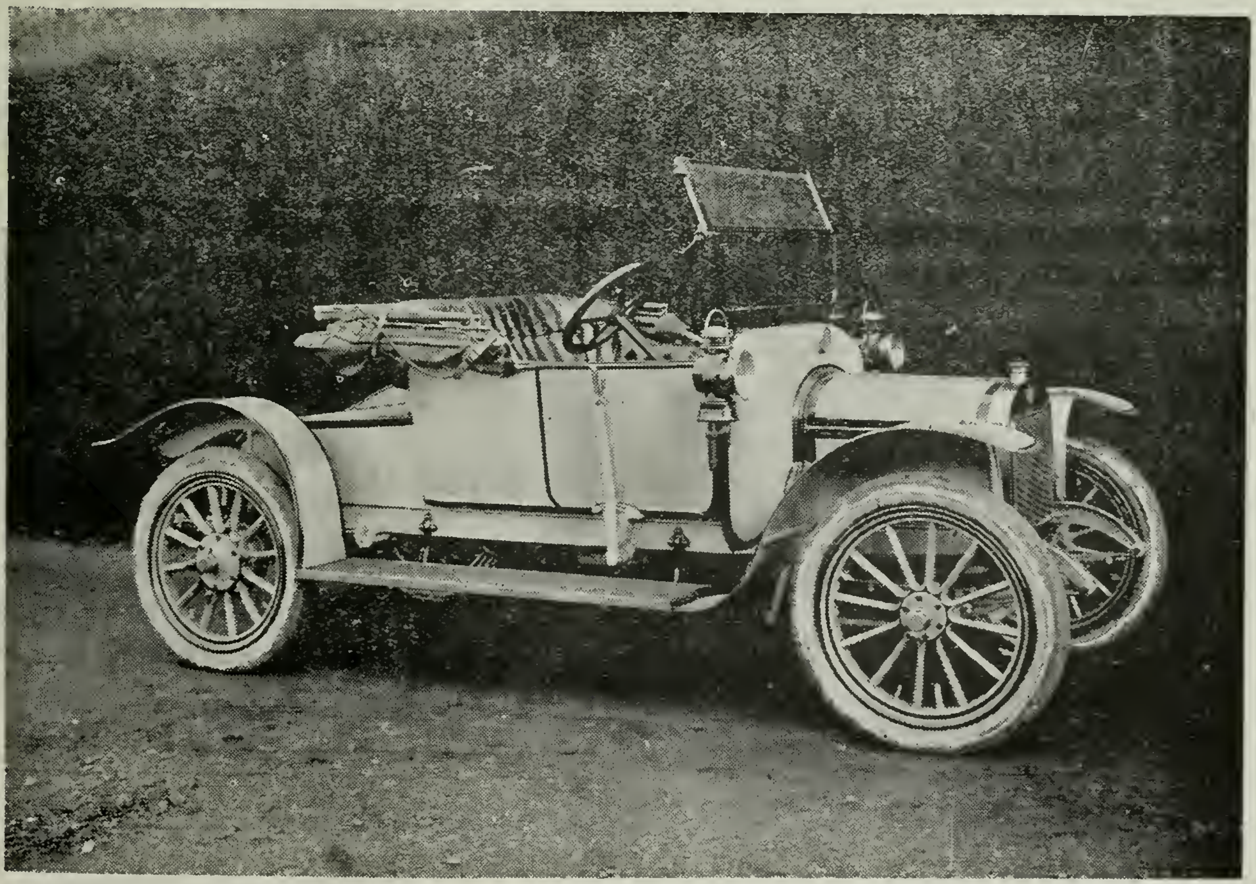
The following are the official placings of the competitors in the Park Trophy competition, held on the 10th and 11th inst.:—1st, P. Lang, "Sunbeam"; 2nd J. Dowell Ellis, "Talbot"; 3rd, C. H. Williams, "Talbot." Winners in the "American" section: 1st, M. Behr, "Buick"; 2nd, R. Goldberg, "Mitchell." Winners of consolation prizes for amateur drivers: Messrs. J. O. Lucas and T. Greig. The undermentioned also competed: T. B. Adair, "Waverley"; S. Anderson, "Sunbeam"; J. Howie, "Charron"; C. Hoare, "Metallurgique"; J. Campbell, "Flanders"; E. P. Evans, "Regal"; E. G. Izod, "Talbot"; C. E. Legge, "Buick"; R. G. Lucas, "Delâge"; B. J. Penney, "Ford"; J. H. Rider, "Talbot"; C. B. Russell, "Talbot"; C. G. Saker, "Talbot"; and A. Williams, "Sunbeam." It is significant to remark that all competing cars negotiated the course of approximately 160 miles with little adventure considering the roughness of the roads, and the obstacles which many of the small cars, in particular, experienced, by the patches of deep sand of necessity encountered. The competition, on the whole, has been one of the most successful yet organised, and creditably reflects the management of the T.A.C. committee.

Many old landmarks are fast disappearing in Johannesburg, the more recent to undergo this change being the block, well known to motorists, situated at the corner of Loveday and Marshall Streets. One of the buildings now razed, it will be remembered, was for many years occupied by the Johannesburg Vulcanising Works. On this valuable site is to be erected a modern garage worthy in every respect of the great industry represented. Of the forty or more licensed garages on the Rand, very few can lay claim to modern conditions, and it is therefore gratifying to find an effort being made to erect garages in keeping with the advance of this important branch of South African industry. A still greater expansion, it may be added, is anticipated with the adoption of the petrol plough, and other invaluable agricultural motor machines, when their multifarious uses become sufficiently recognised in the sub-continent. The railway motor-car is fast superseding the slow and expensive form of locomotion provided in the push-trolley; in fact, railway development in the sub-continent owes much to the adoption of the internal-combustion engine. The petrol-driven car dispenses with manual labour, unavoidable in the case of the hand-trolley, and in addition to being speedy the running costs are comparatively trivial, taking into consideration its immense utility and time-saving characteristics.

T.A.C. Annual Dinner.

The speech of the T.A.C. president, Mr. J. Dowell Ellis, at the annual dinner of the Club, held on the evening of the

10/14 AUSTIN TWO-SEATER.
AS POWERFUL AS MANY SO-CALLED 15 H.P. CARS.



Particulars from GILL'S GARAGE, Eloff Street, JOHANNESBURG.
P.O Box 4659. 'Phcne 1505.

10th inst. at Potchefstroom, once again emphasises this gentleman's convictions on the need which exists, to use a hackneyed phrase, for a better system of roadways in South Africa. Mr. Ellis urged upon his hearers the necessity of bringing pressure to bear upon the Government in this important matter, and incidentally remarked that the Transvaal should follow the example of the Natal Province, which is persistent in the endeavour towards the betterment of the roadways within its borders. The allusion to some 200 direction posts provided by the Automobile Club, and the participation of the Government in the erection of same was well received by the assembled motorists, to whom the project is naturally of immediate importance. For long, an agitation has been maintained in regard to this commendable scheme, and the thanks of the entire community of motorists are due to the T.A.C. for the successful issues referred to.

"Here and There."

At the next meeting of the Automobile Club it is expected that a final decision will be arrived at in connection with the forthcoming speed trials and annual hill climbs. A suggestion might be made that the Zuurbekom Flats are considered when discussing the venue for the first-mentioned event, as some five miles straight running are possible on these ideal stretches.

* * * *

The Rand Garage and Motor Works evince a pardonable pride in point of the successes attending the two machines, which they represent in South Africa, the " Sunbeam " and the " Buick," in the Park Trophy Trials, and the American car competition held in conjunction with same.

* * * *

The deep ruts in many suburban streets in Johannesburg affording subject matter for the several letters from aggrieved motorists, recently appearing in the local Press, will probably at an early date form the nucleus of court proceedings, following a serious accident, if the attention called for is much longer delayed.

* * * *

All motorists will endorse to the full the defence put forward by a West Rand motorist during the week, when arraigned for exceeding the eight miles per hour speed limit. In pleading not guilty, the gentleman in question informed the Magistrate that the course laid down was not a reasonable one, and further was not in the public interest, seeing there was no danger to the public owing to the absence of much traffic. The same views, it may be remarked, were expressed recently in these columns when commenting upon the absurd speed limits in force in many of the Reef dorps.

* * * *

Gill's Garage are offering a 20 h.p. Stoddard, a car possessing many excellent features, and eclipsing in value much that is offered to-day in the high-grade American machine, many of which are marketed with a money value reputation which few are prepared to dispute.

* * * *

Almost a thousand motor car licences were issued by the Johannesburg Municipality for the year ending June 30th, 1912, an appreciable source of revenue, from which the motorist justly expects much in return. The tariff of licences payable annually to the Council for private motor cars, effects those from 6½ h.p. to cars over 40 h.p., and scales from £3 10s. to £10; charges quite out of proportion to the road wear and tear of the automobile, when comparisons are attempted with other vehicles, and which debars many from entering the motorist ranks on principle, and from other points of view. A revision of the existing tariff, therefore, may be commended to the consideration of the Council.

* * * *

The Wakefield " Castrol " motor oil representatives draw attention to the fact that the winning " Sunbeam " car in the recent Park Trophy Trials was lubricated with this now famous brand of " Castrol." The Wakefield agents are also in receipt of information that an astonishing world's record of 300 miles in 282 minutes was recently effected by a rider of an " Indian " motor cycle at Brooklands, who used exclusively their oil in this unprecedented feat in the annals of motor cycle history. The moral is obvious.

* * * *

The unfortunate accident, with a fatal ending, which befel the occupants of a motor car, in the early hours of a morning this week, reflects, from the reports published, the inadequate lighting of that particular Johannesburg suburb in which the occurrence took place.

* * * *

Motorists will be interested to learn that the manufacturers of the famous Bosch magneto have also introduced to this country a new patent mechanical adjustable lubricator, which, from all accounts, is a safe and reliable appliance for the effective oiling of automobiles, and kindred machines. By its use an estimable purpose is served in that no waste is experienced, the regulation quantity being determined by the simple adjusting of a lever.

* * * *

The theory, so long held, of the monster engine as an essential feature in racing machines has received a rude shock by the results of the racing in the recent Grand Prix, when comparatively small-powered cars established unassailable claim to superiority in the great test of endurance exacted.

* * * *

A successful run has recently been accomplished on the continent, of 320 miles, by a motor car driven by a revolving wing. The vehicle is called the " winged motor car," and has the appearance of any ordinary motor car, save that in front it is shaped like the prow of a ship. From the extremity extends a shaft, to which is attached the propeller, or revolving wing. The engine is of 40 h.p. and rotates the wing by shaft and chain transmission. Its future is the subject of much comment.

* * * *

The production of synthetic rubber is still occupying the attention of savants, and the progress made is of considerable importance, but at the present moment it is highly speculative if this artificial production will ever substitute the place of the genuine article in the manufacture of rubber tyres. Its employment, however, for the cheaper kind of rubber goods, may appreciably ease the rubber market.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

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Notes and News.

Brakpan Results. Brakpan Mines, in common with other properties in the Further East Rand area, is shaping remarkably well at present. In the quarter ending June 30, 4,222 feet of development work were done, of which 3,173½ feet were on reef averaging 8·7 dwts. over 41·9 inches. In the quarter ending March, 1,916½ feet of development work were achieved, of which 1,563 feet were on reef averaging 8·7 dwts. over 47·7 inches. The profit for the June quarter was £112,069, or 14s. 3·37d. per ton; and for the March quarter £70,715; or 11s. per ton. Capital expenditures were £4,642 March quarter, £11,327 June quarter. A dividend of 15 per cent. was declared on June 14. These are remarkably fine results for a property that only commenced crushing last year, and is, moreover, a deep level proposition of more than average depth. With its huge claim area, fine equipment, and sound development and financial position, the future of the Brakpan Mines is undeniably full of promise. The results secured by the company up to the end of June last were 528,169 tons milled, revenue £784,809, and profit £310,273.

* * * *

Tweefontein. The Tweefontein Colliery, in the Middelburg district, although it is the youngest producing colliery, is now selling an average of about 26,000 tons per month. Twenty-five Siskol coal-cutters are at present employed, compressed air being supplied by means of a Pokorney-Wittekind engine.

* * * *

South African Anti-Malarial Association. In forwarding copies of the annual report of the South African Anti-Malarial Association, the committee of that admirable body states that it has sufficient confidence in the value of the work of the Association to submit that it has a claim to the support of all individuals and companies who have an interest in the advancement of South Africa. The initial movement in all reforms is a campaign of education, and the main object of the Association is to educate—to make known that mosquitoes are not only troublesome, but dangerous, and to show how the dangers these insects are responsible for may be avoided. The report and chairman's review of the work of the past year serve to show what, so far, has been accomplished. Future operations depend to a considerable extent upon the amount of funds at the disposal of the Association. It is intended to carry on a vigorous campaign, but there is a large field to cover, and additional funds are urgently required. In this connection the committee desires to emphasise that the work of the Association is not confined to any one Province, nor are the benefits accruing from the work confined to areas in which malaria makes its appearance regularly or at intervals. The whole country must ultimately benefit as a result of this crusade, and on this account the work of the Association must appeal to all public-spirited citizens and corporations throughout the whole of South Africa. The committee earnestly asks for the continued support of those individuals and companies who have generously subscribed in the past, and further asks for the assistance of those who have not so far subscribed.

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The Cost of Living: An Official Enquiry. The Administration of Southern Rhodesia has appointed the following as a committee of enquiry for the purpose of "ascertaining facts in regard to the conditions which govern the cost of living" in Southern Rhodesia: The Hon. Sir E. H. Walton, chairman; Messrs. F. Eyles, M.L.C., G. Mitchell, M.L.C., M. E. Cleveland, and E. C. Baxter, with Mr. A. W. Beadle as secretary. The scope of the enquiry is determined as follows: (1) The relation between the prime cost and the cost to the consumer of merchandise imported, and of the principal necessaries of life produced and manufactured in Southern Rhodesia. (2) The extent to which the cost of the principal necessaries produced or manufactured, imported commodities, or building, is affected by ocean freights, railway freights, the existing Customs duties on imported goods, local methods of transport, the credit system, and the rate of wages paid to European and native employees. The first meeting of the committee will be held at Bulawayo on August 26th.

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T.G.M.E.

For the year to March 31, 1912, the T.G.M.E. operated a larger proportion than had normally been the case previously of low-grade ore, as the rights to mine in the Clewer region expire in May, 1913. The report shows that, consequent on securing an enormous addition to the electrical power that has been in operation now since about August, 1911, and additions to the plant, including a third tube mill, the total capacity of the Central 60-stamp mill and the two outside mills of the Vaalhoek 10 stamps and the Elandsdrift 5 stamps will be increased to some 13,000 tons per month for the Central section, and 2,000 tons additional for the outside Vaalhoek and Elandsdrift sections, raising the total yearly capacity to about 180,000 tons. For the year to March 31, 1912, about 144,000 tons, and for the year previously 122,000 tons were dealt with. The total ore reserves at March 31, 1912, were about 350,000 tons Central section ore of 14·22 dwts. grade, also 40,500 tons of Vaalhoek ore of 10 dwts. grade, and 26,000 tons of Elandsdrift ore, the latter expected to yield approximately the same as secured last year, say, a profit value of about 74s. per ton.

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A London View of the Eldorado.

Probably the true explanation of the fall in price of Eldorado shares is to be found in the fact that the Main Reef pay chute is now so comparatively short that, unless it lengthens considerably again, each new level will only develop about a month's supply for the mill, while the much longer parallel reef (with its average of 6 dwts. for pay ore) is, in any case, so near the margin of profitability that the admitted recent increase in the proportion that cannot be taken into ore reserves is a serious matter. That, at least, is the view London adopts, and it is pertinently queried, " It would be interesting to know if the new consulting engineer has gone thoroughly into the question whether it does really pay, on the basis of current costs and extraction, to mine the parallel reef beyond the portion which can be stoped together with the main reef."

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Durban Roodepoort Deep.

The Durban Roodepoort Deep is able to report most satisfactory returns for the three months ended June 30. The profit was £21,653, as against £14,308 for the preceding quarter. The reef disclosures were as follows:—Main Reef, 1,255 feet, width 24 inches, assay value 39s. 11d.; South Reef, 1,830 feet, width 10 inches, assay value 128s. 11d. Ore received from mine, 89,481 tons; waste sorted out, 18·0 per cent; tonnage crushed, 73,300 tons; number of stamps operating, 100; number of tube mills operating, 3. Value of ore before crushing (reflected by mill yield and value of pulp): mill yield per ton, 21s. 11d.; assay value of pulp, 10s. 6d.; total, 32s. 5d.; the value per ton is calculated at 84s. per fine oz. Total yield, 26,657 ozs. fine; total yield per ton, 30s. 7d. The payable tonnage developed for the half-year is as follows:—Main Reef 15,000 tons, value 22s. 8d.; South Reef 81,410 tons, value 32s. 4d.; total tons, 96,410; total value, 30s. 8d. Development operations for the quarter have been satisfactory, the footages and reef disclosures being shown above. Capital expenditure for the quarter amounted to £1,232 8s. 1d. An amount of £21,301 is required for the completion of authorised work. The working costs for the quarter remained high, owing to some further abnormal expenditure being incurred, but the profits are higher by £7,178, due to the increased tonnage milled and to the better grade of ore crushed. The grade is above normal, and is not likely to be maintained as high, especially during any period of shortage of labour, when more Main Reef must be broken by machines. An influx of water into the lower workings has delayed the driving of the main haulage level somewhat. The starting of the new central pumping scheme on the 12th level at No. 1 shaft will also be somewhat delayed in consequence.

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McCreedy Tins.

With tin at its present high price, it is probable that the cassiterite areas of Swaziland will engage more attention in the future than they have in the past. That operations there can result in a substantial profit under good management is shown by the excellent record of the Transvaal Tin Company and also by the McCreedy Tins, Limited. The latter concern, despite many difficulties, principally in connection with an exceedingly heavy depth of overburden and also with the water race, earned a profit during the year ended with June last amounting to £2,348. The output was only 45 tons 10 cwt., so that the financial result secured may be deemed satisfactory. The manager now believes that he has " broken the back " of the heavy work, and that in the future instead of having to treat useless overburden he will be able to put through good and highly payable gravel. A new elevator has been acquired and the plant has been further improved by the purchase of an alluvial drill. But for the additional cost of improving the plant and other incidental expenses and but for the unexpected drawbacks, particularly with regard to overburden, the debt of £5,000 which had been reduced to £2,245 exclusive of the July output, would have been wiped out altogether.

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Electric Tin Smelting.

Apropos of the excellent article on electric tin smelting that recently appeared in our pages from the pen of Mr. G. Rissik, it is noteworthy that within the past year or so a trial electric smelting plant has been erected in Cornwall for the reduction of tin ores on a scale not usual for this class of work in England. At first glance it might be supposed that the electric smelting of tin would have little or no chance as compared with the old-established Cornish tin smelting; but the results of the trials suggest that this is not so. Metallic tin and its ores are commercially so valuable that every wastage is a serious loss. The losses in the ordinary coal-fired reverberatory furnace are considerable, and this is the case to an even greater extent in the shaft or blast furnace sometimes used in other countries. Most of the disadvantages of the old furnace, it is claimed, can be overcome by electric smelting methods. The plant erected in Cornwall consisted of a specially designed electric furnace capable of dealing with about two tons of ore a day, a suitable transformer and appliances for the final purification of the tin. The power supply was three-phase current, produced by oil engines for mining purposes; and although the costs of the power thus obtained were by no means so low as they would be for production by means of coal in other districts, they were not prohibitive. The furnace was designed for about 200 kilowatts, or about 260 h.p., but only 90 to 110 kilowatts were available, or the daily output would have been considerably increased. The working of the furnace was absolutely steady, so that electric light could be operated off the same line without showing any flickering. As no combustion takes place in the electric furnace, only the theoretical amount of coal necessary for the reduction had to be added, or about 14 per cent., instead of the 22 per cent. or 25 per cent. (with Bolivian ore even more) required by the reverberatory process. The furnace being practically closed, the losses from volatilisation were all but eliminated. In fact, tests made over a week with a temporarily arranged condensing tube proved that less than 1 per cent. escaped in this way. Altogether about 20 tons of metallic tin of a purity of 99·5 per cent. (purer than ordinary tin on the market) were produced during the trials. The average power consumption was about 2,000 kilowatt hours per ton of tin, but many runs were made with only 1,500 kilowatt hours per ton. In a larger plant, running regularly as a working concern, the power consumption may be expected to be as low as 1,400 kilowatt hours per ton of tin. The labour cost is also reduced, as three men and a boy can easily handle a furnace turning out 10 tons of tin a day if suitable appliances for handling the ore and the metal are provided. This, of course, refers to the smelting furnace proper, and does not include the men necessary for the subsequent handling of the metal. These facts strongly corroborate Mr. Rissik's recommendations regarding the possibilities of electric smelting in the Transvaal.

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The Metric Carat. The number of Governments that are adopting the metric carat of 200 milligrams for the measurement of gems is increasing, and South Africa may soon have to follow suit. The law establishing the metric carat in France was scheduled to take effect on 1st January, 1911. An Italian law of 7th July, 1910, provides that the metric carat shall be used in the sale of pearls and diamonds. The use of the term carat for any other weight than 200 milligrams is prohibited. A law was scheduled to take effect in Roumania on 1st January, 1911 (old style), establishing the use of the metric carat as the weight by which diamonds, fine pearls, and precious stones should be sold. Steps are being taken for the adoption of the metric carat in the Netherlands. A similar law has already been proposed in Belgium. An agreement was made by jewellers and lapidists in France, Switzerland, Norway, Roumania, Bulgaria, and Spain to work for the adoption of the metric carat by their respective countries as a means of simplifying trade in precious stones.

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A Drill Dust Eliminator. The foreman of the North Butte Mining Company, U.S.A., has invented a dust eliminator in connection with drilling machines. *Mining Science* reports that the apparatus does not conflict with the changing of the drills, and the device, it is said, can be manufactured for less than 50 cents. An exhibition test of the machine, recently made, showed that not a particle of the dust from the drilling into the rock escaped, it all being run into a canvas tube. As a comparison, the dust eliminator was detached and the machine started up. Within a few seconds the air in the raise in which the machine was operating was filled with particles of metal-laden dust, which, after a minute, was so thick that one could not distinguish a person a few feet away through the candle light. A patent has been applied for the apparatus, and already some of the mines of the Anaconda Company are adopting the dust eliminator.

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Geldenhuis Deep. The Geldenhuis Deep shows an increased profit for the quarter ended June 30 last. The total was £48,600, as against £42,578 for the preceding three months. Seven thousand nine hundred and thirty-three feet of development were done. The reef disclosures were as follows:—Main Reef 1,526 feet, width 16 inches, assay value 50s.; Main Reef Leader 2,219 feet, width 11 inches, assay value 83s. 7d.; South Reef 2,053 feet, width 19 inches, assay value 58s. 10d. The tonnage milled was nearly 8,000 tons less than that of the previous quarter, but the working profit was £6,505 greater, entirely due to improved results from the West Section. During the quarter the development redemption rate charged to working costs was increased from 2s. 9d. to 3s. 6d. per ton milled. The work in connection with the erection of the new headgear at No. 2 shaft is now approaching completion, and it is hoped to bring it into commission during July. The change over from the old to the new headgear will stop the hoisting operations at this shaft for two or three days. There has been a sharp decrease in the number of natives in the company's service, with the result that the number now at work is below the requirements of the mine. The supply of ore in the North Section is rapidly diminishing. The payable ore returned as fully developed for the six months ending 30th June, 1912, amounts to 111,023 tons, the value of which is estimated at 27s. 4d. per ton. In addition, a further 97,512 tons of payable ore were exposed, which will be fully valued and included in the development when completely blocked out. The capital expenditure for the quarter on new construction has amounted to £12,368 14s. 6d. An amount of £12,370 is required for the completion of authorised work.

TOPICS OF THE WEEK.

MINE EMPLOYEES AND EMPLOYERS.

The success that is attending the efforts of Rand mine directors, led by Mr. Schumacher, to improve living conditions on the mines, again draws attention to the progress of this excellent movement. Wisdom lies in a well-thought-out policy of amelioration in this direction, and Mr. Patrick Duncan, we are glad to see, pointed out at a political meeting on Tuesday night that the Labour Party had no monopoly of concern for the comfort of the working man. It has been said that the successful employer is probably not a hero, a saint, nor a philanthropist, and that he will probably fail in business if he attempts to become any one of these. This is largely true; but, on the other hand, the employer of the future will have to embody something of all of these qualities. Employers generally will have to do what some have already learned to do so splendidly, namely, to serve the interests of the industry, the worker and the community. This is a high but not unrealizable ideal for the employer. Turning to the other side of the question, what conditions have the changes in the basis of labour brought about for the employees? Certainly each change has meant improvement. Better conditions by far obtain to-day in the leading industrial countries than ever before. As the mines, however, continue to lavish expenditure on improving conditions, there comes the demand for some compensating factor, and, as an American writer puts it, " we can find it only in increased skill and efficiency on the part of the worker." This is a most serious matter for both employer and employee. Efficient and skilled workers are already scarce—every employer knows this—and there is no supply in sight. The increase in skill has not kept pace with industry's progress. Instances might be multiplied of public testimony to this fact from mining leaders on the Rand. But a remedy for this condition must be found. It is evident that the needed skill and efficiency cannot come without education. More attention must be given to vocational training of workers, and it is encouraging to note that educators, employers, philanthropic agencies, and more recently trades unions, are recognising this. If organised labour could do as much toward increasing efficiency as it has towards rendering the men discontented with their rate of pay, it might be forgiven much. It is generally recognised, however, that the change which has done most to prevent the larger prosperity and progress of industrial workers is the increasing distance between the employer and employee. The growth in size of plants has separated those who are bound together in interest, and the contacts which formerly made friendliness possible are diminishing. " This personal intercourse and sympathy between employer and employee is the medium for the transmission of that subtle something which, while having no place on the records of industry, has been the basis of industry's greatest achievements." Call it morale, loyalty, *esprit de corps*, or good will. An American employer whose testimony is entitled to respect because as president of a large mine he has been successful in paying dividends and in winning the good will of his employees, says: " The financial interests of my corporation require that I shall do everything possible to improve the workers' character, efficiency and friendliness." Emphasis is placed upon the economic value of these three things—" character, efficiency and friendliness." The conditions surrounding and affecting employees are not " only their concern, but their responsibility—this responsibility to be expressed not in paternalism but by fraternity, which is the real need of the workers. Realising these things an increasing number of employers has wisely decided to put money into improving conditions of working, living and recreation surrounding their operatives. Some of these schemes have been very successful, other have failed. If we analyse the failures, however, we will always discover some fundamental reason. One American company, for example, has put thousands into welfare work, apparently without any very lasting result, and not many years ago, even after the welfare work was started, that company had a very severe strike on its hands. Why? Because the employer had not gone at the thing in the right way; he had been too paternalistic. Every box of "output" had a label on it, "We do so and so for our men." The average working man resents this sort of thing. But such attempts such as the one described are worthy even though unsuccessful and have had their place in the present great movement for economic welfare. The truth is, as many experienced employers testify, that to be successful such work must be "co-operative." The employees themselves must be given a share in it, and the manner and form of the aid given must be studied. We are continually reminded of the fact that the interests of employer and employee cannot be divided. They are mutual, they are identical, and what has thus been joined together, let nothing put asunder. There are conditions to be changed, improvements to be made, wrongs to be righted and advances to be achieved which require joint agreement and joint effort. Here are some "improvements in conditions" now being discussed:—"A living wage as a minimum in every industry and for the highest wages that each industry can afford. The gradual and reasonable reduction of the hours of labour to the lowest practical point, and for that degree of leisure for all, which is a condition of the highest human life. A release from employment one day in seven. The principle of conciliation and arbitration in industrial dissensions. The protection of the worker from dangerous machinery, occupational disease, injuries and mortality, and suitable compensation for injury. We do not say that these demands are right, but if they are—How can they be met except by co-operation? Legislation alone will not do it. Legislation may accomplish much in establishing uniformity and curbing unsocial tendencies on the part of employers who disregard progressive tendencies in order to get an advantage. For example, the store which keeps open longer than its rival, or the manufacturer who saves the money his competitor spends for betterment. But there are limitations to the benefits of legislation. On the other hand the value of co-operation is unlimited. The future of industry will show the superlative law to be that which affects, not methods and machinery, but men. The test of industry's success will not be profit gained regardless of wrong inflicted or burdens imposed, but the greater profit through right dealing and right relations. The policy that increases the happiness and contentment of the workers usually results in the largest dividends to the shareholders. Mine directors on the Rand have shown themselves alive to these considerations. It remains for the men to realise their responsibilities.

THE COST OF LIVING.

NOTWITHSTANDING the recent reduction in railway rates, the cost of living in South Africa continues to cry out for attention. In Rhodesia, a Commission has been appointed to report on the question, and in Capetown and Kimberley the whole subject has been hotly debated of late. At Capetown, last week, it was recalled at the Chamber of Commerce meeting that the chief feature of the Majority Report was its frank admission that the cost of living must be reduced before industries, conducted on a great scale and employing white labour to a large extent, could hope to flourish. It will be remembered that a working-man's budget was given, in which the prices of the necessaries of life in South Africa were compared with the prices in the United States and the United Kingdom. Taking eleven articles, the weekly cost in pence was 182½ in Great Britain, 227¼ in the United States, and 213¼ in South Africa. In face of this interesting comparison, it was certainly somewhat remarkable to find the Majority Report expressing the view that "it is in the best interests of the country as a whole that adequate protection should be given to agriculture and industrial undertakings." Mr. Jagger gave, last week, some striking examples from the suggested tariff of what this "adequate protection" means, and Mr. Macintosh, in his Minority Report as a member of the Commission, calculated that the net effect would be to increase the burden upon the taxpayer by a million sterling. Mr. Jagger quoted certain figures from the last Report on Divisional Council valuations, which go to show that in the past ten years the valuations of property rated for divisional purposes—excluding the Cape Peninsula—have increased by near 43 per cent., while in many of the best agricultural districts the average value of properties has risen by a very much larger amount. This is rightly regarded as an indication that the farming community is not in urgent need of increased protection. The Majority Report, as Mr. Woodhead observed at Capetown, is simply "a mass of inconsistencies." It will be interesting to see how its chaotic conclusions fare at the hands of the Rhodesian Commission. Here on the Rand we stand in imminent danger of being lulled into a false sense of security by the contemplation of the recent railway rate reductions. The ultra-protectionists are an active, militant and not disinterested body. They are organising a campaign, a predatory coastal attack, directed at the interior; and it behoves us to look alive, lest Government takes back through the Custom house what it grudgingly remitted through railway rates.

ALLUVIAL GOLD IN SOUTH AFRICA.

IT is not a little surprising that, despite all its auriferous conglomerates and quartz, schistose and ironstone reefs and lodes, this country to date has shown itself exceedingly poor in alluvial gold. Years ago the diggers at Mac-Mac, in the Pilgrims' Rest field, earned a very generous return from "gravel," but since the halcyon days of the late seventies and early eighties, the Transvaal has become entirely a reef mining country, and, in so far as discoveries to date are concerned, one feels, in writing of alluvial gold in South Africa, something like the man called on to write the natural history of snakes in Iceland. In June of this year, for instance, all the mineral areas of the Union yielded the meagre total of 120 ozs., worth a trifle over £500, and it would appear that not only within the boundaries of the Union but in Rhodesia, Swaziland, and Portuguese East Africa as well, have the lucrative possibilities of winning gold from gravels been recognised. In the De Kaap Valley in Manicaland, in the Zoutpansberg, and in the Swaziland Protectorate, one may observe such derelict affairs as dredgers or sluice boxes, or the beacons of what were once accounted fields of gold. A few years ago reported discoveries of alluvial in the Lomagundi District of Mashonaland attracted much attention. The far West Rand has had its brief epoch of alluvial excitement. Even Knysna, in the Cape Colony, has been regarded as an area of golden gravels. Companies and syndicates have been floated with the most alluring titles, such as the Good Luck Syndicate and the Golden Horseshoe, Ltd., but to recapitulate the ambitions and achievements of the various alluvial projects of South Africa is to travesty our industry. And yet it is certain that in many a creek, and at the foot of many a berg and kranz in South Africa, the precious metal is to be found mingled with the detritus washed down by the rains and torrents of the ages. It is so all the world over where gold occurs. The odd thing is that South Africa, with more gold in her natural storehouses than any other continent has up to the present failed to yield up to an ever-exploring band of prospectors a really payable alluvial field. To go no further from home than the Northern ridges of the "White Waters," or the gentle slopes that shrink away to the Klipriversberg Range, it seems passing strange that no gold shed from the escarpment of the Rand has been discovered, either to the north or south of the line of mills and headgears that denote the world's greatest gold field. Perhaps we are anticipating history; perhaps we are disappointing a people to whom the discovery of a really extensive and profitable field of golden gravels would mean more than ten rushes to a diamond diggings. However that may be, it is worthy of remark that within the past few days reports have reached us of the finding of an alluvial gold field situated, we believe, at no vast distance from Johannesburg itself. Should it be true, the tremors of the share market are likely to go unheeded for a while to come. Even the marvellous developments that are taking place on the Further East Rand would for a time seem uninteresting, for the discovery of a really important alluvial gold field would undoubtedly move Johannesburg to extremes of excitement and speculation.

THE MODDERFONTEIN GOVERNMENT AREAS.

The Reef Intersected at Two Points—Values Apparently Confirm Original Anticipations—The Possibilities of the Undertaking Considered.

With the intersection of the reef series in the north-east shaft of the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd., at a depth of 2,275 feet, the company has now two communications with the ore body, the first having been made in the north-west shaft a few weeks ago, at a depth of 2,395 feet. These shafts are distant, approximately, 3,000 feet along the level of the reefs, the angle of slope between the bottoms of the two shafts, after allowing for the surface contour, being apparently negligible. A level driven to connect these shafts, and continued on either side of the boundary, would have a total length of about 11,000 feet, or considerably over two miles. The distance from each shaft to its complementary developing shaft along the dip is nearly 7,000 feet, and a simple way of describing the arrangement of the main developing and hoisting centres is to say that they are situated at the corners of a parallelogram, having its adjacent sides 3,000 feet and 7,000 feet respectively, and including an area, therefore, of, roughly, 500 acres. The total area of the ground held by the company is 2,633 claims, or about 1,800 acres, and the shafts are so arranged that the enclosed parallelogram referred to may be said to lie fairly evenly at the centre of the vast block of ground, and to divide the whole into conveniently accessible portions. It was originally anticipated that the reef series would be intersected at a depth of between 2,100 and 2,200 feet from the surface, and the actual depths reached are thus more or less confirmatory of the accuracy of the estimate. The southern, or dip shafts, are expected to meet with the reefs at a depth of about 3,200 feet, and since the south-west shaft is now down to a depth of about 1,900 feet, and the south-east shaft to a depth of about 2,620 feet, they will probably not arrive at their points of destination until early next year in the case of the south shaft, and towards the middle of the year in that of the south-west shaft. Some record sinking has been accomplished, particularly in the south-east shaft, where, in March last, a footage of 233 feet was attained. The manager, Mr. M. H. Coombe, has an excellent reputation and a long and valuable experience in sinking work, and it cannot be doubted that he will show the same kind of aptitude for rapid development as soon as it is possible to get a fair start from the loading stations at the shafts, where the reef body is now in sight. The intersection is, of course, to open up the mine in comparatively large blocks, on the place which engineers generally have decided to be the most advantageous for the low-lying reefs of the far East Rand.

The Question of Values.

The values of the reef are, naturally, a question of prime importance, and as far as the north-west exposures are concerned, it will be admitted by all that the results are distinctly gratifying. The average of samples taken from all four sides of the shaft gave an assay of 7·15 dwts. over about 31 inches, and in a cross-cut north which has again penetrated the reef, the values, according to a recent cable sent to the London office of the company, are still better, namely, 20·5 dwts. over 21 inches. In the same cablegram it is announced that only a portion of the reef has been exposed when samples were taken for assay, the returns showing 4·7 dwts. over 20 inches. "Expect expose reef over whole shaft in a few days," it was added, "when complete assays will be published." It is too early, therefore, to attempt to draw conclusions as to the value of the reef intersected in this shaft. The hopes entertained with regard to the quality of the ore to be obtained from the Government Mining Areas on Modderfontein have from the commencement been based solely upon the more or less uniform character of the reef over extensive distance in the matter of values, as well as thickness, and the remarkable excellence of the recent strike in the Modderfontein Deep Levels, where 9 dwts. over 10 feet of reef were obtained, goes far to encourage the sanguine expectations formed in respect of the Government claims when the Barnato house put in the tender, which was eventually successful. Taking the recovery of the immediately surrounding properties for the month of June, 1912, commencing with Brakpan Mines on the west, and going round the outcrop ground to Geduld on the east, we find the figures to be as follows:—

	Recovery per ton milled.	Total Working Costs per ton milled.	Profit per ton milled.
Brakpan Mines	32/ 3	17/ 6	14/ 9
New Modderfontein ...	40/10	21/ 8	18/11
Modderfontein B. ...	37/ 5	17/10	19/ 2
Geduld Prop.	26/ 0	20/ 5	5/ 0

The Geduld, owing to working difficulties, makes a comparatively indifferent showing in the matter of profits, although the ore value is by no means unsatisfactory. A rough average of the recoveries tabled is about 34s. per ton milled, and at the lowest figure, with a crushing of, say, 2,500,000 tons per annum, or a similar quantity to that which is being put through the mill at Randfontein, the annual profit should be, with a working cost not higher than that of Brakpan Mines, well over a million.

A Possible Profit.

It is impossible to say what the actual average of the ore is likely to be, but it will be observed that a rough average of the recovery obtained by the Brakpan Mines and the Geduld Proprietary, companies which may be regarded as providing more reliable data for the Government Areas than the outcrop companies, is 29s. per ton milled. It does not appear at all unreasonable, therefore, to assume that a working profit of about 10s. per ton is a possible one, and in view of the evidence of the tabular statement given above, and of the general working conditions which may be expected, many would feel inclined to look upon a profit of 10s. as a minimum. An interesting calculation, on a basis of 27s. recovery and 10s. profit per ton milled, makes it evident that, in accordance with the terms of the Government lease, the company would receive about two-thirds per cent., or nearly 7s., the remainder going to the Treasury. The total profit on an annual crushing of, say, 720,000 tons, on this reckoning, would be, approximately, £250,000, or, say, 17½ per cent. on the share capital of £1,400,000. There is nothing definite as yet to go upon for the purpose of calculations of this kind, but, merely tentative and suggestive as they are, and probably not outside the region of probability, they serve to indicate the magnitude of the interest involved in the future of this immense undertaking.

A mine managers' examination will be held at the School of Mines on the 24th, 25th, and 26th of September. Applications for entry must reach the Secretary, Box 1132, Johannesburg, by the 9th of September. The compulsory subjects are mining and mine ventilation, mechanical engineering, legal knowledge, chemistry and surveying, while geology and mineralogy are optional.

Simmer East.

Elsewhere in our advertisement columns will be found a notice of sale by auction of the Simmer and Jack East, Ltd. (in liquidation), on September 26. It is seldom, of course, that a mine equipped on such a large scale as the Simmer East, and withal a mine declaring monthly profits, is sold by auction. We shall have something more to say about the sale in our next issue.

THE GEOLOGICAL PROBLEM AT DERDEPOORT.

A Petrological Puzzle—No Reliable Solution Offered—A Pipe More Than a Square Mile in Area.

THE extraordinary occurrence at Derdepoort known to the Geological Survey as a "volcanic breccia," and described by other geologists in various terms, no two of which, as far as we can gather, are in agreement, continues to remain more or less of a puzzle to all who have examined it. In the meantime work is being continued actively by the Central Diamonds, under the supervision of Mr. H. F. Cooper, and although diamonds have been found, and a large number of shafts and cuttings have been made in the deposit, the directors recognise that they have still a very great deal to do before they can give assurance to the public that a payable diamond mine has been discovered. What may be called the volcanic area has been proved by them to extend over a mile in length and approximately a mile in width, and, assuming that the occurrence is, in the main, actually kimberlite, a point which has still to be decided, it is possible that one portion of it may be practically barren of diamonds, while another is comparatively rich, or, finally, that the whole is of no economic value. Until a sufficient number of points over this enormous area have been investigated by means of the rotary washing pan, it would be premature to venture upon definite statements of any kind with regard to the commercial aspect of the proposition. A beginning is being made near the southern end of the company's ground, where a paddock about 40 feet deep, all in soft yellow ground, has been started. It should soon be possible to make a fairly conclusive test of the ground at this particular point.

A DIFFICULT PROBLEM.

The occurrence extends well beyond the southern boundary of the company's property on to the adjoining township, where various areas have been taken up and partly investigated. Recent exploratory work, carried out by the Central Diamonds, has thrown some interesting light upon the physical character of the deposit generally, although its precise petrological nature is likely to remain a matter of argument for some considerable time to come. It appears to be certain that in describing the mass broadly as a "volcanic breccia" the Geological Survey were using the only term possible until a very careful and detailed examination is made of it under conditions which do not present themselves at the surface. There is no reason to suppose that there is any magmatic segregation into basic and acidic portions, for what may be, and have been, regarded as acidic dykes are shown to be little more than a superficial crust of acidic rock fragments. Below them the soft greyish-yellow ground, which Mr. F. M. Krause considered to be a weathered peridotite, or kimberlite, may be found to extend fairly continuously, and, as a matter of fact, the evidence obtained in the various shafts and workings of the Central Diamonds leads one to expect that the main body of the eruptive mass is composed of weathered and unweathered portions of the peculiar micaceous rock, said by Mr. Krause to be peridotite. The contained fragments of foreign material are evidently derived from the various stratified and eruptive rocks through which the true pipe matter has forced its way. They comprise felsite, quartzite, shale, diabase, and, most interesting of all, large blocks of dolomite. The other bodies are to be seen *in situ* at the surface in the immediate neighbourhood, the dolomite, however, has been brought up from a distance of between one and two miles. The actual existence of boulders of dolomite is of less interest than the fact that an enormous quantity of this material has been torn from the lower horizons of the Transvaal system and left stranded so many thousands of feet above its original position, so much of it, indeed, that the whole pipe appears to have been saturated with carbonate of lime. To such an extent has this hydrolytic action taken place that it seems impossible to take up a piece of rock of any kind from the volcanic area which has not been penetrated to a greater or less degree with this material. It was observed by the Geological Survey, who remark:—There are the usual angular fragments of red granite, quartzite, and dark, shaly material, with an occasional crystal of biotite. But we can notice a good deal of calcareous rock, having the appearance of veining the breccia, and not showing any fragmental characteristics.

MICROSCOPIC EVIDENCE NECESSARY.

The all-pervading presence of the carbonate of lime has had the effect of disguising the real character of the micaceous pipe rock to such an extent by replacement and other processes that no one has yet been able to say authoritatively what it really is. The presence of biotite ilmenite and diamonds suggests that it is a variety of kimberlite, and Mr. Krause asserts that microscopic garnets are to be discerned. The available evidence is not conclusive, of course, but taken in connection with all the circumstances of the case, the kimberlite theory appears more credible than any other at the moment. It has yet to be decided what the essential petrological characters of kimberlite really are. A careful microscopical examination of rock slides taken from this extraordinary and evidently complicated rock mass will doubtless enable geologists to arrive at some definite conclusions as to its predominant character. Until this is done it seems hopeless to endeavour to arrive at a reliable solution of the problem. The Central Diamonds are not immediately concerned with the purely scientific aspect of the proposition. Having proved to their satisfaction that diamonds exist and that the kind of ground in which diamonds have been found occupies the greater portion of the pipe, it is their business to sample the area for the best prospects. It is so vast that it has speculative attractions of quite a unique kind. In the words of one of the directors, "it may mean a colossal fortune or it may mean nothing," and from this point of view the enthusiasm which it has aroused in the breasts of those concerned may easily be understood.

Messina (Transvaal) Development Co.

JULY RETURNS.

The Secretary reports:—"The mill ran 20·5 days and treated 1,825 tons of ore obtained chiefly from development. The output of concentrates for shipment was 239·42 tons, average assay value 48·5 per cent. copper, and 117 tons of middlings assaying 13·7 per cent. were also produced; 1,044 feet of development was accomplished. The new hauling shaft (No. 5) is now down 45 feet. Middle lode 3rd level west of the dyke shows lode going 12 per cent. copper for 20 feet. North lode 4th level west drive has been driven 75 feet and assays 20 per cent. copper over the distance. At 5th level the drive east on the footwall portion has advanced 73 feet, and assays 10 per cent. copper over this distance. At 6th level all winzes and raises are in good ore. At 8th level a cross-cut through the footwall exposed reef over 50 feet wide having an average assay value of 12 per cent. copper. All work at the surface and underground is progressing favourably."

Mr. Wm. Duffus, the original head of the late firm of Duffus Bros., Pritchard Street, has executed an admirable portrait of the late Mr. J. G. Hamilton. The picture has been hung in the Chamber of Mines.

PRESENT POSITION AT THE RANDFONTEIN CENTRAL.

Improving Monthly Returns—Revenue and Profits Show a More Reassuring Tendency—The Question of Ore Reserves.

Whereas, a few months ago, the falling revenue, diminished profit, and general unsatisfactory appearance of things at the Randfontein Central were such as to draw adverse comment of an emphatic kind, both here and in London, the returns of more recent months are so much more reassuring as to give rise to the hope that steady period of improvement has been inaugurated on the property. The accompanying figures are of interest as showing the record of the company during the past two and a half years.

Year ending Dec. 31.	Stamps.	Tons Milled.	Revenue per ton.	Expenses per ton.	Profit. Amount.	Profit. per ton
1910	400	1,168,641	27/ 5	18/ 2	£538,584	9/ 2
1911—						
Mar. qr.	607	366,834	26/11	18/ 0	162,000	8/11
June qr.	721	566,366	24/10	16/ 6	237,000	8/ 4
Sept. qr.	753	600,784	24/ 3	16/ 6	232,000	7/ 9
Dec. qr.	775	625,049	24/ 4	17/ 0	231,000	7/ 4
1912—						
Mar. qr. ...	798	656,641	23/ 8	17/10	172,000	5/10
April	700	199,518	24/ 3	18/ 5	58,000	5/10
May	700	210,138	24/10	18/ 0	72,800	6/10
June	700	198,547	25/ 1	17/ 9	73,250	7/ 1

It may be pointed out that the operations of the newly amalgamated company were first published in the Chamber of Mines Analysis for the month of March, 1911, so that the progress of the Randfontein Central, as exhibited in the tabular statement above may be taken as having been fairly under way at the beginning of the June quarter of last year. There was a steady diminution of profit during the remainder of the year, in spite of increased crushings, and in the first quarter of 1912. The relapse culminated in an estimated profit of £53,000 in March, according to the Chamber of Mines Analysis, and there seemed no reason to expect that affairs were likely to improve under the existing circumstances. The somewhat sweeping changes in the administrative staff occurred about this time, and altogether things looked none too promising at the Central. In April, it will be seen, the profit rose to £58,000, and a large advance was made in May by the recording of a profit of £72,800, a figure which was slightly improved upon in the succeeding month. If one compares the returns of this year with those of the corresponding period of 1911, it will be noted that the outstanding feature is the higher level of working costs. In June, 1911, for instance, they were 16s. 2d. per ton milled, while in June, 1912, they were as high as 17s. 9d. per ton. The recovery, on the other hand, was greater in the latter month, and in this way some sort of compensation has been effected. The improvement in the recovery grade, as a matter of fact, has been somewhat marked latterly, and if it may be taken as indicating a new line of policy, its effect will be worth watching. It is difficult to say whether costs are likely to be reduced to the point around which they ranged during the greater part of last year; it is apparent that an effort is being made to reduce them, with some degree of success. A conjunction of improved recovery and more normal working costs should soon make a material difference in the monthly profit, and it is gratifying to find that under both heads there is a tendency in the right direction.

As we have said before, a great deal depends upon the ore reserve position. At the end of last year the comparative statement of progress was as follows:—

	Payable. Tons.	Payable. Value, dwts.	Unpayable. Tons.	Unpayable. Value, dwts.
1910	5,534,303	7·54	755,024	—
1911	5,658,859	7·29	978	2·83

The figures show that the position was, at any rate, fairly well maintained. At the meeting of the Randfontein Central, on January 24th, 1912, the Chairman, Sir Jan Langermann, said, *inter alia*:—"At our last annual meeting I referred to the exploitation of other reefs in addition to West Reef and Randfontein Leader, traversing the property. Of these, the New and East reefs proved to be so satisfactory in value and permanent in character that they have been extensively developed during the past year. The New reef is a narrow body, and of this we have developed 263,500 tons, of which 225,000 tons are valued at 5·6 dwt. over milling width. About the East reef the manager reports that it is a reef of great width, of satisfactory value, and presents no difficulties in mining. It has been traced northwards for a distance of 3,000 feet. Since the close of the year the manager reports further on the East reef as follows:—'Development on the 2nd level continues satisfactory. To the north 12 feet have been driven, assaying 9·5 dwts. over 60 inches, while the south drive advanced 22 feet, valued at 8·2 dwts. over 60 inches. The reef intersected at 50 feet in the borehole in the footwall at No. 3 station, incline depth 600 feet, assays 5·4 dwts. over 133 inches, or 7·7 dwts. over 77 inches.'" This was a welcome announcement, and it may be expected that the development which has been actively continued on this section will prove it to be an asset of no small importance.

Bloemhof Diamonds: July Returns.

The official returns of diamonds for the month of July actually sold from the various diggings in the district total 5,891½ carats, valued at £28,738 9s., which is a considerable increase in value on the returns for the previous month. Taking into consideration that a great number of diggers have left these fields on the approach of the extremely cold weather, the results as given above are highly satisfactory, and foretell greater prosperity in the coming spring. Bloemhof again heads the list of finds. During the month 613 returns were made of 1,479¾ carats, valued at £7,474 5s. Mooifontein is next with 437 returns of 1,477½ carats, valued at £6,883 8s. Panfontein made 226 returns of 844 carats, valued at £3,931 17s. 6d. Blesbokfontein, with 26 returns, registered 407¾ carats, valued at £1,797 7s. 6d. London made 70 returns of 266¾ carats, valued at £1,475 5s. Weltevreden with 61 returns registered 231 carats, valued at £1,201 10s. Kuilfontein made 50 returns of 182¼ carats, valued at £823 12s. 6d. Koksrust registered 142¼ carats, valued at £730 12s. 6d. Christiana made 36 returns of 193½ carats, valued at £1,080 7s. 6d. Rietput returned 125¼ carats, valued at £659 15s. Grootdoorns registered 139¼ carats, valued at £585 7s. 6d. Modderkraal with 19 returns registered 63¼ carats, valued at £343 5s. Kroomellenboog made 7 returns of 80¾ carats, valued at £305 15s. Schweizer Reneke with 4 returns registered 28 carats, valued at £150 10s. Avondster made 7 returns of 22¾ carats, valued at £74 15s.

It is stated that all the preliminaries in connection with the opening up of the Veelsgeluk Estate coal proposition, fifty miles beyond Hlobane, which has been taken up by a German company, have been completed, and that an extension of the line from Hlobane and the development of the mine will be commenced at once.

AFRICA'S LOWEST GRADE MINES.

Working Costs at the Wanderer and Barrett's—A Lesson for the Outside Districts.

The two lowest grade gold mines operated in British Africa to-day are the Barrett's, in the Barberton area, and the Wanderer, in the Selukwe district of Matabeleland. In view of the importance that attaches to the problem of reducing costs on the Witwatersrand, some enquiry into the operating expenses at these two ventures should prove of much interest, although, of course, the conditions obtaining at these mines are vastly different to those on the Witwatersrand.

Geological Features of Barrett's.

The Barrett's, or Barrett's Berlin, mine has been worked for close on thirty years. Dr. Molengraaff, formerly State Geologist of the old South African Republic, in his famous report, wrote: "In the Lydenburg district there is a lower and upper group of auriferous reefs in the dolomite. The lower group is of the Tweefontein type, and rich in manganese. The mines at Barrett's Berlin and Spitzkop belong to this group, and this horizon is known locally as 'Diggers' Leaders.'" In "The Geology of South Africa," by Messrs. Hatch and Corstorphine, this occurrence is referred to as follows: "The disintegrated and decomposed lower beds of the dolomite has been worked for gold at Barrett's Berlin, near Kaapsche Hoop. According to the State Geologist's report, 'a dark brown tufaceous earth, rich in iron with decomposed pyrites, is mined in big open quarries and treated for gold by the direct cyaniding process.'"

Low Working Costs.

Clearly this class of ore body lends itself to cheap working. The last annual report stated that 31,518 tons of ore milled yielded 3,593 ozs. of gold, of a value of £13,913, at a cost of 6s. 8d. per ton. In June last the recovery was only 1·3 dwts., or 5s. 6d. per ton. The Barrett has certainly not yielded much in the way of profit, but, on the other hand, the mine has managed to keep going for years past on ore worth less than 2 dwts. per ton. At the Wanderer, working costs during last year were 7s. 6·18d. per ton milled, as compared with 8s. 0·23d. in the preceding year. The items which make up the total of 7s. 6·18d. are as follows:—Mining, 2s. 0·42d.; tramming, 8·00d.; milling, 1s. 5·37d.; cyaniding, 1s. 6·40d.; maintenance (roads and buildings), 0·76d.; general expenses (mine and surface), 1·22d.; sundry charges, 10·15d.; development, 9·86d. The Wanderer company is working a huge impregnation deposit about six miles from Selukwe. The ore consists of a mixed quartzose and schistose rock in a much crushed zone of banded ironstone. The gold is found in the schists and also in the quartz-magnetite cherts. The company operates a dry crushing mill equal to about 100 stamps with cyanide plant. We state these particulars of operations at the Barrett and Wanderer mines as being of interest from the point of view of low working expenditure, rather than that of pointing any real moral, or constituting an example for mining on the Witwatersrand, although it has in the past been contended by advocates of the dry crushing method that the large low grade Selukwe mine points an example to the Rand, and indicates a means to the reduction of working costs. But with this view we do not associate ourselves. The cost of ore reduction and ore treatment is, after all, but a minor item in Rand working costs. The greater portion of the Witwatersrand's expenditure bill has to be met below the surface. No one who has any real knowledge of the conditions obtaining on the Rand, at the Wanderer, and at the Barrett's mine would for an instant assert that labour organisation, general administration and mine management were more efficiently carried out at Selukwe or in the Barberton area than they are on the average Witwatersrand mine.

Natural Facilities for Cheap Working.

The reason why the Wanderer and the Barrett's are able to work so cheaply is because of the peculiar nature of the ore bodies which they are exploiting. The workings are huge, and the ore is friable, so that the exploitation of these properties is, in fact, quarrying out of soft and easily mined ore. There is all the difference in the world between the hard conglomerate of the Transvaal and the friable ore of the Wanderer and Barrett's mines. Whilst we cannot urge any example for the Witwatersrand to follow in the cases of these two ultra low grade properties, the one with a dry crushing plant and the other with direct cyaniding, there is, we think, a moral which the country at large might take heed of. In our last issue we wrote of the dearth of new mines and the regrettable paucity of genuine and hard-working prospectors—the type of men who take their coats off and labour rather than endeavour to float syndicates. Too often has the gold-bearing prospect in the outlying districts been "turned down" because an opinion seems to prevail that something over 10 dwts. per ton is necessary to earn profits. There are, no doubt, many auriferous formations in South Africa lying far from existing railway lines which, although only carrying two or three dwts. of gold per ton, can, on account of the peculiarly advantageous natural conditions prevailing, be made to yield profits. We fancy that this great and much ventilated question of earning profits from low grade ore is not so much a problem for the Rand alone as it is for South Africa in general. In a few instances—at the Wanderer, the Barrett, and the Worcester, for example—have the natural facilities for cheap working been recognised and taken advantage of, but we believe in many cases the glamour of, and desire for, the ounce has blinded the prospector to the value of the modest 6 or 7 dwts.

Important Natal Colliery Deal.

The sale by auction of the Talana Colliery, last week, was an event which excited considerable commercial interest. There had been protracted negotiations concerning the disposal of this concern for some months past, but it appears these must have been successfully kept secret, since the figure reached by the first and only bid for the entire concern was £16,550. It was not known until after the sale that well-known shipping interests in London have got behind the mine. These are understood as including the Elder-Dempster directorate and the Andrew Weir Co., and it is now stated it is possible that combination with another well-known Natal colliery concern will come about shortly. The amount paid for the mine represents virtually what was owing upon it. The Wallsend (Natal) Collieries, Ltd., on whose behalf the undertaking has been purchased, consists, it is believed, of a new financial interest which is about to enter into the Natal coal industry. The estate consists of 2,822 acres of coal-bearing land, which is stated to have a 32 years' life under a production of 10,000 tons per month, and the colliery was originally started in 1898.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South ond Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

SIX MONTHS OF GOLD WINNING.

The Progress of the Industry in the First Half-Year—Results of the Central Mining Subsidiaries.

The improvement in the sharemarket has scarcely been maintained for all the excellent developments that have taken place on the further east Witwatersrand. One is perhaps too apt to adopt the view that sharemarket prices are the reflex of the industry, and, *vice versa*, that the industry is the reflex of the market. Prices go up and prices go down, but the mills go on crushing as usual; in fact, they are crushing more to-day than at any previous period in the history of the Witwatersrand. In the first half of 1911 the mines of the Transvaal crushed 11,708,193 tons of ore, and in the first half of the current year 12,847,652 tons. Other comparative figures are:—

	Six months, 1911.	Six months, 1912.
Stamps at work ...	9,869	10,055
Tube Mills at work ...	210	263
Yield	£16,889,615	£19,297,044
Per ton	28s. 4d.	29s. 6d.
Costs per ton	18s. 0d.	19s. 0d.
Profits per ton	10s. 0d.	10s. 1d.
Total Working Profit	£5,796,132	£6,447,560

It will be of interest to extend these comparisons to the various groups. The companies under the control of the Central Mining and Investment Corporation claim first attention. The statistics appended are, it should be made clear, in each period the aggregate returns as declared each month to the Chamber of Mines and do not include gold reserves. Items such as sundry receipts and expenses are in some cases included and in others omitted, but those do not materially affect the conclusions and the figures given may therefore be allowed to stand. Taking fourteen mines under the Central Mining and Investment Corporation control, it is to be observed that ten propositions secured larger profits and four smaller than in the six months of 1911, the net result being an advance in profit of about £221,000. It will be of interest to contrast these earnings. They are as under:—

	First Half, 1911.		First Half, 1912.	
	Ore Milled.	Profit.	Ore Milled.	Profit.
Bantjes Cons. ...	131,457	£28,300	138,510	£34,946
City & Suburban	156,045	76,268	160,819	121,180
City Deep	131,693	38,303	235,730	135,000
Crown Mines ...	759,100	615,990	933,000	645,483
Durban R. Dp.	128,360	30,950	143,125	37,439
Ferreira Deep ...	183,001	196,250	210,270	226,487
Geldenhuis Deep	403,230	129,665	337,960	89,660
New Heriot ...	72,623	54,268	68,060	54,124
New Modder ...	269,700	170,037	281,000	227,998
Nourse Mines ...	331,401	126,006	316,600	132,335
Robinson	295,100	468,300	279,600	398,659
Rose Deep ...	331,100	164,300	381,800	208,269
Village Deep ...	274,900	97,900	296,800	134,840
Village Main Rf.	239,850	231,979	237,395	207,650

On a unit basis, figures compare as under:—

Company.	Revenue per ton. 1912.		Revenue per ton. 1911.		Expenses per ton. 1912.		Expenses per ton. 1911.		Profit per ton. 1912.		Profit per ton. 1911.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Bantjes Consolidated	29	8	26	10	24	7	22	6	5	1	4	4
City and Suburban ...	37	0	30	0	21	6	20	3	15	6	9	9
City Deep	34	2	31	0	22	8	25	2	11	6	5	10
Crown Mines	32	3	35	10	18	6	19	7	12	10	16	3
Durban Roodep't Dp.	30	0	29	6	24	3	24	7	5	9	4	11
Ferreira Deep	43	9	42	5	22	5	20	11	21	4	21	6
Geldenhuis Deep ...	30	0	26	6	24	7	20	7	5	5	5	11
Jumpers	37	11	38	6	34	0	30	4	3	11	8	2
New Heriot	39	3	35	0	23	4	20	1	15	11	14	11
New Modder	36	2	30	7	19	10	17	8	16	4	12	7
Nigel	30	0	33	6	23	7	26	0	6	5	7	6
Nourse Mines	30	2	28	3	21	10	20	11	8	4	7	4
Robinson Gold	44	9	45	9	16	1	14	0	28	6	31	9
Rose Deep	29	0	28	2	18	0	18	3	11	0	9	11
Village Deep	29	0	25	8	19	11	18	6	9	1	7	2
Village Main Reef ...	35	2	36	10	17	10	17	5	17	4	19	5

Both the Bantjes and the City and Suburban record marked improvements in grade and in profit earned per ton milled. The City Deep has attained to something more closely resembling working conditions and whilst the ore milled has increased from 131,693 to 235,730 tons the profit has been trebled. The Crown Mines crushed a much greater tonnage, but the grade is only 32s. 3d. as against 35s. 10d., the profit per ton has declined from 16s. 3d. to 12s. 10d. per ton and the total profit is barely £30,000 greater. At the Durban Roodepoort Deep a small increase in revenue is to be noted, more ore has been milled, and the profit has improved from £30,950 to £37,439. At the Ferreira Deep there has not only been a betterment in grade but the ore milled was 27,000 tons greater and the profit shows an increase of about £30,000. The Geldenhuis Deep shows up very poorly. The yield per ton is higher, but working expenses have advanced by 4s. per ton, the tonnage is down and the profit is £40,000 lower. The New Heriot has about maintained its position, meeting reduced tonnage —arising from an accident—and higher costs by putting up the grade. Costs have risen at the Modderfontein, but an appreciable expansion occurred both in the quantity and value of the ore treated, and the profit at £228,000 shows a rise of £58,000. The Nigel has successfully combatted fall in grade with greater tonnage and reduced cost; a feature with respect to the Nourse Mines is a rise of 2s. in yield. Mechanical troubles interfered with the treatment of a normal tonnage on the Robinson, which naturally increased costs; there is also a slight falling off in grade. Consequently the profit at £399,000 is £70,000 down. Rose Deep records an all-round improvement—larger tonnage, higher grade and reduced costs; the profit is better by £30,000. Influences of an exactly contrary nature account for a fall of £14,000 in the net earnings of the Village Main Reef. The Village Deep returns are vastly better. Crushing only started during the latter part of last year on the Modder B; comparative figures are naturally not available. During the past half-year the company earned a profit of £166,000 from a gold yield of 36s. 2d., with costs at 18s. 6d. Taken all round, then, the progress of the industry as reflected by mines under Central Mining and Investment Corporation control is very satisfactory. True one or two mines record lesser profits for the first half of 1912 than for the first six months of 1911, but the aggregate group result is a substantial improvement.

Mr. J. K. Addie, who has for years held a responsible position under the Consolidated Mines Selection Company, as manager of the De Rietfontein Colliery at Springs, has been appointed manager of the Witbank Colliery, in succession to the late Mr. K. Tamplin Lewis.

WHERE THE OUTPUT COMES FROM.

Mill and Cyanide Yields Contrasted—Some Notable Variations—Mineralogical Peculiarities on the Far East Rand.

To-day between 63 and 64 per cent. of the gold recovered by Witwatersrand mines is derived from the plates, the exact figures for the month of June being: Total output, £3,055,944; yield from milling, £1,941,900; yield from cyanide works, £1,114,044. In September, 1903, the percentage of total output of gold for the month recovered by mills was approximately 63, the mill yield being valued at £733,620, concentrates £63,620, sands £330,095; and slimes £41,611. Towards the end of 1903 the Messrs. Denny enunciated their "new metallurgy," but it was not until the following year that tube mills first made their appearance on the Witwatersrand at the New Goch and Glen Deep. Since those days Rand metallurgy has seen vast changes and many improvements. It is therefore not a little interesting to note that to-day the "mill," or in other words, the amalgamated copper plates yield approximately the same percentage of output that they did before the introduction of the tube mill. In 1903 the origin of the gold recovered was stated according as to whether it was won from mill, from concentrates, sands or slimes. To-day two columns suffice in the Chamber of Mines analysis sheet, and it is stated whether the gold has been derived from milling or from cyaniding. It is of much interest to analyse the yields of the mines to-day and see how the recoveries from plates or from milling compare with those from cyaniding. The Rand from end to end is pretty much of a consistent proposition, in so far as its mineralogical constituents are concerned. Neither are there any remarkable variations in the scheme of treatment adopted by different mines. It is worthy of note, therefore, that large variations as between gold recovered from milling and from cyaniding are to be observed as between the figures recorded by various companies. In the following tables the June recoveries of different mines to the nearest thousand are stated according to the different groups. Figures are given as to stamps and tube mills employed.

	Stamps.	Tube Mills.	Milling Yield	Cyaniding Yield.
			(last three figures omitted).	
Central Mining and Administration.				
Bantjes Consolidated ...	85	3	£21	£13
City Deep	110	9	[illegible]9	26
City & Suburban	140	2	36	16
Crown Mines	660	22	178	77
Durban Roodepoort Deep ...	100	3	27	11
Ferreira Deep	235	7	71	33
Geldenhuis Deep	300	7	55	28
Modder B	80	5	34	26
New Heriot	70	1	15	9
New Modderfontein	180	7	67	20
Nourse Mines	260	7	61	23
Robinson	250	6	71	31
Rose Deep	300	7	63	33
Village Deep	180	6	50	20
Village Main Reef	220	5	49	30
Consolidated Gold Fields of South Africa.				
Jupiter	120	7	25	18
Knights Deep	270	6	34	16
Robinson Deep	245	6	56	24
Simmer and Jack	320	7	45	12
Simmer and Jack East ...	130	3	20	11
Simmer Deep	135	8	28	16
East Rand Proprietary ...	820	25	142	107
New Kleinfontein	220	4	55	17
Robinson Group.				
Langlaagte Estate	200	5	24	38
Randfontein Central	700	29	121	129
Neumann Group.				
Consolidated Main Reef ...	110	3	27	8
Knight Central	105	3	20	8
Main Reef West	100	3	26	7
Witwatersrand Deep	245	4	39	13
Wolhuter	120	4	28	13
General Mining Group.				
Aurora West	80	—	11	6
Cinderella Consolidated ...	80	3	15	10
Meyer and Charlton	75	2	12	18
New Goch	120	4	17	10
Roodepoort United M.R. ...	60	4	21	9
Van Ryn	125	6	37	17
West Rand Consolidated ...	100	4	23	13
Goerz Group.				
Geduld Proprietary	5	2	8	11
Lancaster West	100	3	16	8
May Consolidated	100	—	10	8
Princess Estate	60	5	19	6
Johannesburg Consolidated Investment Co.				
Consolidated Langlaagte ...	110	3	27	8
Ginsberg	80	1	15	7
Glencairn	160	—	9	8
New Primrose	160	—	23	12
New Rietfontein	120	—	15	6
New Unified	60	1	12	5
Witwatersrand	220	—	28	19
Brakpan Mines	150	6	53	36

Of course variations in the number of tube mills employed in proportion to the number of stamps at work and differences in the methods of classification adopted at different mines account for the great bulk of the differences. All the mines, however, with the exception of four, recovered a larger proportion of gold from milling than from treatment by cyanide. These four exceptions were the Geduld Proprietary Mines, the Meyer and Charlton, the Randfontein Central, and the Langlaagte Estate. At Geduld the recovery from the cyanide works is substantially higher than that from the plates because the gold there is in a very fine state of division throughout the ore. The precious metal exists in the conglomerate at Geduld in microscopic particles and extraction by amalgamation alone yields a very poor result. Indeed, the recovery with the old style of mill crushing without subsequent fine grinding would be in the neighbourhood of 21 per cent. only, but by the employment of tube mills the recovery from plates is about 38 per cent. Geduld sands residues run comparatively high. Whereas a 4 dwts. charge on a central Rand mine would give only about ·15 dwt. in the residue, the value of the Geduld residue is as high as ·8 dwts. On the other hand a very good recovery is obtained from slimes—over 90 per cent. In this form the gold of the Geduld ore appears to be freed at once and obviously the ore when in the form of slime is more amenable and the gold contents are more readily recovered than when the precious metal is locked up in any other form. This is fully recognised by the Geduld management and in the new plant a much higher proportion of the output will be derived from slime than at present. At Randfontein, at Langlaagte, and at the Meyer and Charlton, the recovery of more gold in the extraction boxes than on the plates is, presumably, a matter of policy, and is not due to any mineralogical peculiarities in the ore. Before the introduction of tube mills, Randfontein was employing five to seven hundred screening and recovering between 54 and 56 per cent. in the battery The figures given seem to indicate that despite the uniformity of Rand ore the free interchange of technical thought and the co-operation of metallurgists in experimental work there are still very different views and ideas held between metallurgists as to the most efficient methods of ore treatment and classification on the Witwatersrand.

THE MINERS' NEW CONTRACT FORM.

Official Report on the Negotiations Between Labour Leaders and Mines.

In the report for July, published in last week's *Union Gazette*, of Mr. R. Shanks, Inspector of White Labour, is a summary of the negotiations regarding the proposed new agreement with miners working on contract, which (the agreement) was referred to in the previous report as "causing considerable unrest." Early in July, the Transvaal Miners' Association held a meeting at the Grand Theatre, and decided that "in the event of the representatives of the mining houses and (or) the Chamber of Mines refusing to withdraw the proposed agreements or to come to reasonable terms of settlement for disputes," the president and general secretary of the Association should apply to the Minister for a Board of Conciliation and Investigation under the Industrial Disputes Act, and should also confer with the Inspector of White Labour. Messrs. T. Mathews, the general secretary, and W. J. Carbis, organising secretary of the Miners' Association, were deputed to approach the heads of the various mining companies with a view to amicable settlement of questions in dispute. The houses controlling the mines affected were all prepared to meet their employees or their representatives and discuss the agreements with them, but declined to meet the representatives of the Miners' Association.

5,000 Affected.

On July 17, the Miners' Association applied for the appointment of a Board of Conciliation. The application stated that the "employers" were: Certain corporations, each having financial and executive control of certain mining companies set forth in annexure. The employees were designated as "Members of the Transvaal Miners' Association." Approximately 5,000 employees were affected or likely to be affected. Replies were received from the corporations mentioned as employers, that they were not employers of any employees who will be affected by the alleged dispute referred to in the application, and consequently could take no part in proceedings before the board. The Minister's decision as conveyed to Mr. Mathews, was:—"Sir,—With reference to your application of the 17th instant for the appointment of a Board of Conciliation and Investigation into the alleged dispute between members of your association and their employers, I am instructed by the Honourable the Minister of Mines to inform you that from the statements received by him it appears that a certain number of the companies named in the schedule attached to the application are not employers of persons who would be affected by the dispute, and that if the appointment of a Board is still desired the Minister considers an application should be made by employees in regard to one specific mining company, to be named in the application, or, if desired, two or more companies, such application to be signed in the ordinary way by persons representing actual employees of such companies, as provided in Section 8 (4) (d) of the Act.—R. Shanks (Inspector of White Labour)."

Fifty-two Companies Cited.

As the terms of the application, as prescribed in the Act, had not been complied with, the controlling houses were notified of the decision. They were, however, notified that pending further communication, or amendment of the application, the Minister considered that no alteration should be made in the conditions of employment of underground employees by the mining companies proposing the underground contract work new agreement. On July 26, another application was received, wherein 52 mining companies were cited as employers, and 10 or more members of the Miners' Association on each of the 52 mines were stated to be directly affected, the number indirectly affected unknown. The application was again signed by the president and general secretary of the Transvaal Miners' Association.

Replies from Houses.

Replies were duly received in most cases from the controlling houses as follows:—

Replies.	Substance.	No. of Companies Objecting.
1.	That the Transvaal Miners' Association is not an employee of the company	50
2.	That as the names of the members of the Transvaal Miners' Association claiming application are not given, they are unable to state whether applicants are employees of company	50
3.	Directors of companies maintain that Sections 7, 8 (2) (a), 8 (4) (d) and (e), read together, require the names of actual employees to be set forth in the application	50
4.	Directors not aware of any dispute between company and their employees	43
5.	That there are not ten employees affected by alleged dispute	8
6.	That meeting between manager of company and employees discussed new form of contract and no objection has since been notified	18
7.	That every employee affected by the matters set forth in the application has accepted the terms proposed by the company	28

Not in Order.

The Minister again had to point out that the applications were not in order in terms of the Act. An application for the appointment of a Board must be made by employees of an employer, and it must be shown that a dispute exists between those parties prior to the application as in Section 7 of the Act. The 52 applications are made by a union for and on behalf of certain of its members who are employees of the companies mentioned, but does not show that the union has been instructed by the employees of any one, or more particular mine or mines authorising its officers to sign the application in terms of Section 8, Sub-section (4) (d). The applicants may or may not have been authorised to represent the employees on any particular case. There is no evidence to show that the employees of any one or more mines have approached the employers with reference to the proposed alteration of the conditions of employment, or that the employers have refused to reconsider the proposed alteration with their employees.

Compliance with Act.

It is absolutely essential that the provisions of the Act should be complied with before the Minister appoints a board. As pointed out to the association on July 25, the persons who signed the application must be authorised under Section 8, Sub-section (4) (d), by a majority vote of the union after request by the employees of that particular mine who are members of the union. A general resolution attached to an application does not conform with the terms of the Act in regard to mines which were not represented at the meeting or which had taken no steps to instruct the trade union to take action. The Inspector of White Labour understands that the Miners' Association is taking steps to amend the application for a board, in compliance with the provisions of the Act.

THE POSITION OF THE CROWN MINES.

Recent Capital Expenditure and Development Figures.

At the forthcoming special meeting of Crown Mines shareholders on August 30, no doubt the chairman, Mr. S. Evans, will have a word to say on the position at the mine. Meanwhile, we find the estimated financial position of the company at 30th June, 1912, reflected in the interim balance sheet, working expenditure and revenue account for the quarter and appropriation account (subject to audit), also particulars of the quarter's development and reduction operations. The accounts show:—

WORKING EXPENDITURE AND REVENUE ACCOUNT.

	Cost.	Cost per ton milled.
To Mining Expenses—		
Mining	£289,031	£0 12 2
Development Redemption ...	27,656	0 1 2
	316,687	0 13 4
,, Reduction Expenses	87,823	0 3 8
,, General Expenses—Mine	21,277	0 0 11
,, General Expenses Head Office	8,815	0 0 5
Total Working Expenditure ...	431,632	0 18 4
,, Working Profit carried down ...	321,475	0 13 7
By Gold Account	£756,107	1 11 11

To Sundry Expenditure	£6,580
,, Profit carried to Appropriation Account ...	311,986
	£321,566

INTERIM APPROPRIATION ACCOUNT (SUBJECT TO AMENDMENT).

To Government Tax (estimated)—		
For 3 months ending 31st March, 1912	£31,853	
For 3 months ending 30th June, 1912	31,500	
		£63,353
,, Debenture Issue Expenses		249
,, Dividend Account—		
Interim Dividend No. 22 of 55 per cent. declared 18th June, 1912		517,058
,, Balance carried to Balance Sheet		531,216
		£1,111,876
By Balance brought forward 31st December, 1911		£160,909
,, Balance of Working Expenditure and Revenue Account—		
For 3 months ending 31st March, 1912	£338,981	
For 3 months ending 30th June, 1912	311,986	
		650,967
		£1,111,876

*The credit balance of appropriation account does not represent the amount which will be available for distribution, as the amount of liability at the commencement of the financial year (£985,313), together with the capital expenditure for the six months ending 30th June, 1912, on new construction and undermining rights annuity, amounting to £184,461, have not yet been appropriated.

DEVELOPMENT WORK.

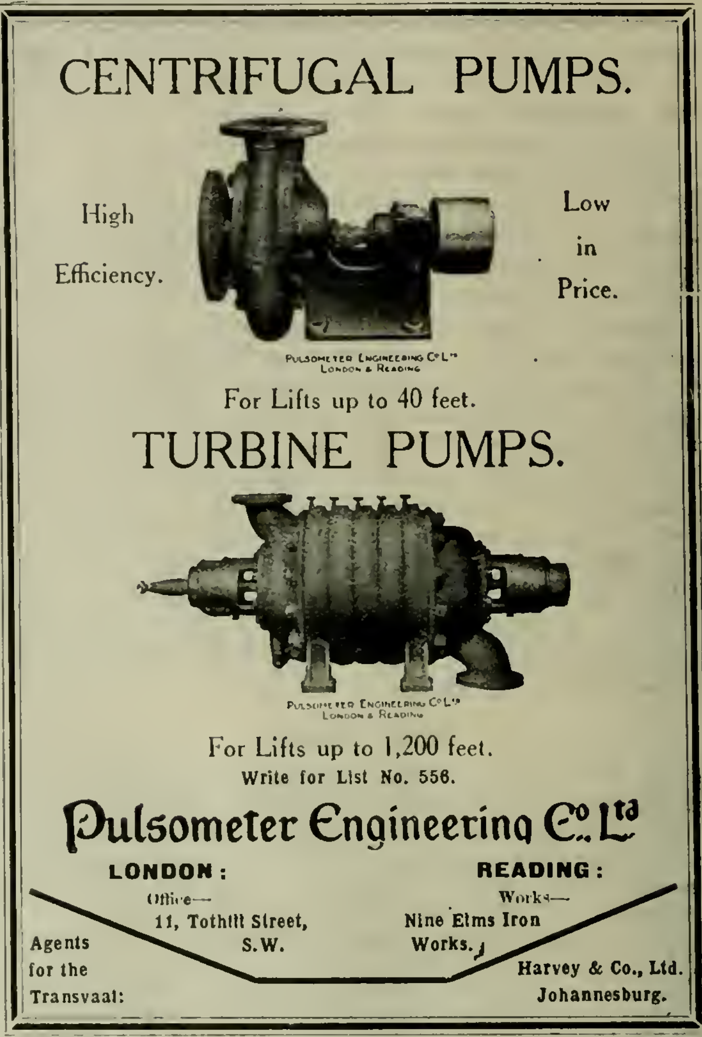
Number of feet driven, sunk and risen, exclusive of stopes, 12,609 feet. The reef disclosures were as follows:—Main Reef: Distance exposed, 545 feet; width, 36 inches; assay value, 10s. 11d. Main Reef Leader: Distance exposed, 3,980 feet; width, 22 inches; assay value, 65s. 1d. South Reef: Distance exposed, 1,977 feet; width, 32 inches; assay value, 54s. 2d.

REDUCTION WORKS.

Ore received from mine, 513,776 tons; waste sorted out, 12·6 per cent.; tonnage crushed, 474,100 tons; number of stamps operating, 660 stamps; number of tube mills operating, 22 tube mills. Value of ore before crushing (reflected by mill yield and value of pulp):—Mill yield per ton, 22s. 6d.; assay value of pulp, 11s. 3d.; total 33s. 9d. (The value per ton is calculated at 84s. per fine oz.). Total yield, 180,127 fine ozs.; total yield per ton, 31s. 11d.; accumulated slimes, tonnage treated, 100 tons; accumulated slimes, yield, 37 fine ozs.

GENERAL.

366,000 tons of ore of a value of 28·5s. were developed during the six months ending 30th June. This tonnage will be added to considerably so soon as the development and valuation of further blocks of ore which are only partially exposed have been completed. During the quarter the expenditure on capital account amounted to £100,445 6s. 5d., whilst a further sum of £27,458 13s. 1d. was expended on mine development suspense account. An amount of £130,057 remains unspent on account of authorised works, but it may be possible to effect some saving on this amount. The native labour force at the end of the quarter was 12,909, as compared with 13,711 at the end of March, 1912.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THE GEOLOGY OF THE WITWATERSRAND.—III.

A Criticism of Mr. J. S. Olver's Views by N.E.B.

In view of the resuscitation of the discussion at the Geological Society on the horizon of the Rietfontein series, the following continuation of a criticism by N.E.B. on Mr. Olver's theory of the Lower Witwatersrand is of some interest:—

In Chapter II., under the generic title of "Witpoortje Section," the author adopts a revolutionary reading, which involves a considerable duplication distinct from and additional to the well-known effect of the Witpoortje fault. This novel duplication is said to occur on a fault recognised by Mr. Olver under the name of the "Orange Grove Fault." The evidences adduced are of two kinds: 1st, sectional correlations of the strata affected by the duplication, and 2nd, local presence and eastward tracing of the Orange Grove Fault, together with other corroborative effects. The author concludes that his arguments can be met effectively only "by proving the imperfection of his correlation and the inaccuracy of his tracing of the beds in the various blocks." We shall endeavour to refute Mr. Olver's novel duplication in the manner he suggests, and incidentally we shall be led to also show the unreliability of his fault courses and the superiority, from every point of view, of Dr. Mellor's reading, which is incompatible with the author's.

1.—Sectional Correlations.

Mr. Olver makes use of a section taken from the south-east corner of Witpoortje, No. 44, to the Basement Granite at Witpoortje Falls on Roodekrans, No. 83. It is divided into several portions by the various faults claimed by the author. For the present, we are only concerned with the northern part, from Basement granite to the Orange Grove Fault, and with the central portion extending from the latter to the Government Reef.

In order to do justice to the true facts, we cannot, much to our regret, confine ourselves to the data supplied in the book. The sketch illustrating the Witpoortje section has not sufficient detail, and the absence of a scale, together with the lack of sharpness of the diverse beds hinder direct measurements of thickness. Moreover, the parts that now concern us have a further disadvantage, arising from being copied from Dr. Molengraaff's section. This section was originally taken on the west side of the Witpoortje Gorge, where faulting affects the very strata from which Mr. Olver draws local evidence of his "Orange Grove Fault." But a section taken threequarters of a mile east of the gorge escapes this drawback, as the admitted faulting is here visibly north and clear of the critical beds. Such a section may then include these beds, in continuous and undisturbed sequence, to the central portion of the author's section, and constitute an independent refutation of his reading. We are then inevitably led to employ our own diagrams and figures computed from minute mapping surveyed in the area covering the Eastern Section. If we consider the differences in geographical course, technical establishment and geographical treatment, this diagram agrees as well as can be expected with Dr. Molengraaff's section passing through the same pivot, Witpoortje Station. It amply shows absolute concordance across the gorge for all beds south of the supposed fault. This concordance has enabled us to transfer Mr. Olver's reading from his section to ours, but in doing this we have had to draw assistance from his descriptions and fragmentary thicknesses. Curiously enough, and somewhat helpfully for this transfer, the context shows that many observations were recorded on the eastern side of the gorge and not on Dr. Molengraaff's route.

Mr. Olver partly bases his new reading on "the accepted sequence exhibited in the neighbourhood of Johannesburg." But he has not attempted to supply, graphically or otherwise, details and dimensions of that sequence. Yet a section, taken where that succession is normal, in the name area of the Hospital Hill quartzite and of all older beds, gives much too eloquent testimony as to the value of his reading, to be treated by mere reference to previous publications. Hence we have again made use of our own information, and we append to the section east of the Witpoortje Gorge a typical Johannesburg section which we have personally established, by similar treatment of the area covered by the townships of Orange Grove, Mountain View, Observatory and Bellevue. In support of the fairness of our two sections, we may mention the following. The Johannesburg area is that recommended by the Government geologist, at the last meeting of the Geological Society, as yielding the most representative section of the beds included within its limits. On the same occasion, and by the same authority, the ground east of Witpoortje Gorge, on which our measurements have been taken, was stated to yield, within the limits of the lower Hospital Hill quartzite and the Main Reef series, a section closely fitting the conditions found in two other normal areas, respectively situated just west of Florida and of Germiston. At the same meeting, we minutely inspected Dr. Mellor's Florida section, and found it a step by step facsimile of our Witpoortje section, with the only apparent difference that some of the quartzites tend to even greater thickness at Florida.

Now, in seeking bases of correlation between two distant sections, each determined within a relatively narrow cross-sectional area, it is obvious that a physical feature of any given horizon must be known to be sharply marked, closely continuous and frequently exposed, before it can be trusted for sure detection in both sections. The contested formation, below the Government Reef, includes bankets which fulfil the necessary requirements in the undisputed tracings and correlations. Yet, in the contested identifications the author makes individual use of only one reef, and describes conditions which show it to be at least ineffective and unreliable for that purpose. It can also be shown that the features mostly used by the author are essential qualifications. The ferruginous or magnetic character of any of the included shales can be proved by steadfast tracing to be evanescent, or at least discontinuous. The colour of any bed is subject to all possible changes along its course. The speckled nature of a thin quartzitic sandstone between shales in like manner, can be shown to frequently disappear in every one of the different horizons in which such a bed occurs. Quartzites will coarsen into quartzitic sandstones at various points along their strike, and the latter will grade into plain and occasionally soft sandstones. Likewise soft sandstones will gradually turn shaly, and shales become sandy. Fortunately there are no instances known of a habitual sandstone ever changing into a true clean shale or vice versa. The useful detection in this case has only one single solid resource, namely, the physical distinction between shale and sandstone. But a sequence of alternating beds of only two essential kinds is in itself meaningless, unless it is characterised by notable differences of individual thicknesses. Hence, in a tentative correlation of two such sequences, the degree of absolute, or at least proportional concordance of the thicknesses, will be a true criterion of accuracy. In the correlation under discussion, irregularity of original sedimentation or later deformation of either section might have rendered this process unavailable. Fortunately the close mapping of Dr. Mellor and his exploratory forward tracings have proved the absence here of both unfavourable conditions. Hence sectional correlation, based on thicknesses, should be possible, and can be insisted upon here before accepting any reading. Inspection of our sections will show that, in the accepted reading, the distinct beds, common to both, are unavoidably few. They are the speckled bed, the Hospital Hill shale, and the lower Hospital Hill quartzite. Yet they concord so well in thicknesses that we can at least claim that they give a fair notion of what a correct correlation should yield. But our diagram also shows graphically Mr. Olver's contrary reading. It is really startling to find that no possible grouping of even a few of its distinct units, will conform or approach to thickness concordance. Under these circumstances, step by step criticism of this reading would lead us into wearying repetitions, which would certainly smack of carping insistence. As further and much broader means of refutation are available, we shall leave to the reader's inspection the detection of each separate discrepancy. Their full gravity could not be anticipated from the author's descriptions and were perhaps unknown to him for lack of precise surveys. Should it be doubted that thicknesses form in this case the essential criterion for correct sectional correlation, then we submit that a reading, rebellious to that criterion, is almost always open to being shifted by two, four, six or more steps, without injury to its probable accuracy. We shall apply this test to Mr. Olver's reading in our diagram. To fit with the typical Lower Hospital Hill quartzite, let us take the thickest gritty quartzite between the Red Reef series and the West Coronation Reef. On description it deserves this attribution at least as well as the West Coronation quartzite used by the author. It is as little like clear quartzite as the latter, it also has above its foot a small pebbled reef, and it contains fewer contradictory shaly beds. Underlying its foot we find a bed of banded ferruginous quartzitic shale of a thickness equal to that of the West Rand shale, and rather less unlike typical Hospital Hill shale. Under this, and in a position somewhat less unsuitable for the Speckled Bed, a bed of quartzitic sandstone, more persistently speckled than the author's. Below this, fair chaos, but no whit worse than in Mr. Olver's reading. On the whole, it is not quite so startling as the latter. The divergence in total thickness is smaller, and we no longer have to correlate the typical Ripple-Marked Bed, a 33 feet thick clean quartzitic sandstone, with a composite bed over 460 feet thick—(Mr. Olver states this thickness as under 120 yards). In fact, it is open to choice to correlate it with a clean quartzitic sandstone 12 feet thick, a sandstone of 27 feet or another quartzitic sandstone of 26 feet, all fairly close to each other and strongly outcropping amongst shales and soft sandstones. We thus see that Mr. Olver's reading does not stand against the shifting test. One outcome of inspection of our diagram must now be placed on record for future reference. That is the composition of the formation known classically, and mentioned by Mr. Olver, as the lower Orange Grove quartzite. Thanks to exposures, perhaps unavailable to our predecessors, several shale bands have been found in that formation, formerly held to be wholly composed of clear quartzite. These bands of shale or sandy shale have an aggregate thickness of over 30 per cent. of the whole. Thus in correlations where regularity is postulated or proved, a thick bed of clear quartzite continuously exposed in cross and section can no longer be identified with the lower Orange Grove quartzites. Mr. Olver's reading of the Witpoortje section is based not only on "the accepted sequence in the neighbourhood of Johannesburg," but also on observations made between his Orange Grove Fault and the Witpoortje Falls. This Falls area contains the beds read by the author as the direct duplication of the formation south of his Fault. We have already mentioned the presence of longitudinal faulting north of our Witpoortje section. North of this faulting many beds are extensively folded and deflected; they offer no inducement for a precise cross-sectional survey. Being unable, for that reason, to provide a detailed and dimensioned section of that area, we have recently re-inspected it up to the Northern Fall. As the result, we make the following statements with the utmost confidence. Referred to the standard of our Orange Grove Observatory section, every outcrop of quartzite, or sandstone, occurring in the Falls area has almost exactly typical thickness, and as far as this can be estimated under the circumstances, occupies its correct position. For instance, the detail of the Orange Grove Beds correspond most visibly to that already observed at Johannesburg, with the improvement, however, that the central strata there unsightable, here appear clearly as shales. Owing to the presence of unsurveyed faulting and of probable duplication of the Hospital Hill shale, it would be hazarded to assign definite figures to the collective thickness of the beds in the Falls area. Yet this much may be safely said. On general appearances it is probable that this thickness is practically equal to that at Johannesburg, but it is possible that the included shales are locally thickened, up to a maximum increase of 25 per cent. The Ripple-Marked Bed occurs as an unmistakable clean quartzite, at most 40 feet thick, and has walls similar to those at Johannesburg. We thus see that, were a section established

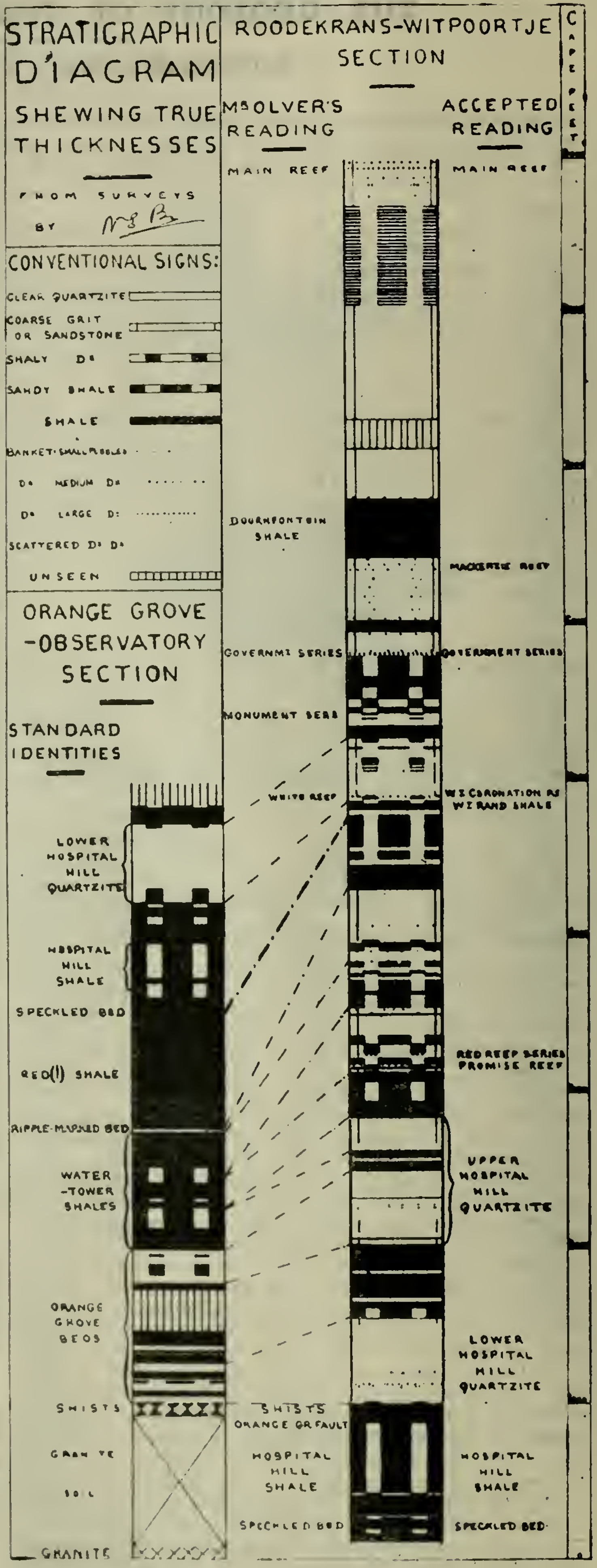

DIAGRAM SHOWING VARIOUS READINGS OF LOWER WITWATERSRAND STRATA, from a precise survey of the Falls area, it would yield a design closely similar to the Observatory section presented by us, and that visible differences in thickness, if any, will be small and confined to thicker shales. Under these circumstances, we claim that the Falls area controverts the sectional correlation bases of Mr. Olver's reading, on the same lines and with the same force as the Orange Grove-Observatory section.

2. The Orange Grove Fault.

The presence of this fault in the Witpoortje section is primarily deduced by the author from the crystalline schists said to underlie the lower Hospital Hill quartzite, alias "the southern outcrop of the Orange Grove quartzite." Now, referring again to our diagram, it will be seen that, underlying that quartzite, our Witpoortje section shows shales—and sandy shales—in uninterrupted sequence. On tracing these beds westward, they were found to gradually become strongly diabasic, culminating, at the gorge, in a type fairly consistent with a description as "schists and diabases." But at this point they are intruded into by oblique faulting which, on the west side of the gorge, affects strata markedly different from those that are disturbed north of our section. This fully accounts, according to general experience, for the gradual change of petrological character. Moreover, the shales and sandy shales occurring in this horizon of our section are of exactly the same type as those outcropping at the corresponding horizon in Observatory Township. Now the only concomitant sign of faulting noticed by the author is said to be the flatter dip of the contested quartzite in contrast to the overlying formation. But there is no token of such flattening within one mile east of the gorge. Further, Mr. Olver states that "the course of the fault can be definitely traced for some ten miles" eastward of Witpoortje. This can only be taken to mean "traced" by its effects, and, for the first few miles, the effects described and sketched by him are equally attributable to the evident faulting which passes north of our section. This faulting is probably a western prolongation or a branch of Dr. Mellor's Rietfontein Fault. The latter similarly accounts for the remainder of the northern disturbances up to Maraisburg. Mr. Olver challenges his critics to "connect up" the Contorted Bed, alias the Hospital Hill Shale, from Auckland Park to the admitted outcrop north of the Orange Grove Fault at Witpoortje. But the map illustrating Dr. Mellor's paper on the Central Rand, and published in the Trans. Geol. Soc. of S.A., Vol. XIV., clearly showed the "a priori" impossibility of continuous tracing, not only on account of the Rietfontein Fault, but also owing to the violent cross folding of the Orange Grove beds north of Maraisburg. By "connecting," the author here probably means sectional correlation; in that case, we have already shown most convincing concordance between the Falls area and the Observatory Township. Mr. Olver makes the weighty claim that "he has repeatedly traced" the Contorted Bed from Auckland Park to Witpoortje south of the railway and used in this tracing several accompanying beds as supplementary guides. But had he compiled over a sufficient area, close and continuous mapping, such as lately-shown by Dr. Mellor, he would have found, just east of Maraisburg, a cross zone of discontinuity and distortion corresponding with the official course of the Rietfontein Fault, and he would then have noticed that the apparent alignments across that fault, of the west end of the lower Hospital Hill quartzite with the east end of the Coronation quartzite, and of the west end of the Contorted Bed with the east end of the West Rand shale, were radically discounted by the marked difference of direction shown by the outcrop on opposite sides of the fault. This is the obvious explanation, arising from a close examination of the detailed mapping shown at the last meeting of the Geological Society of South Africa, and about to be published in their Transactions. In view of this impending publication, it would be presumption to give a sketch from memory, however desirable it might appear to illustrate the conditions which gave birth to the initial field error, an error which, in our opinion, is chiefly responsible for the author's revolutionary reading. He unfortunately found apparently strong corroboration in the faulty observations which led him to state that "both the Orange Grove quartzites and the underlying schists" can be easily traced from the Witpoortje Gorge to the neighbourhood of Maraisburg. Wider experience of Lower Witwatersrand shales would have acquainted the author with their tendency to pronounced metamorphism in the vicinity of dislocations and would have guided him to the true nature of "the underlying schists." East of Maraisburg, the course of the Orange Grove Fault is deduced by Mr. Olver on such confessedly slender bases, that criticism would be superrogatory.

We can more usefully pass on to a consideration of the novel eastward prolongation of the known Witpoortje Fault, up to the point where it enters upon an admittedly trackless journey in the Basement Granite. The author confidently gives evidence of that prolongation only in one portion of its course. It consists of an alleged local duplication of the Orange Grove Quartzites, starting in Parktown West and ending north of Claremont. But Dr. Mellor's close mapping

of this vicinity has shown that, owing to cross faulting at both ends, the upper Orange Grove quartzites, within this portion, are accidentally in line with the lower Orange Grove quartzites outcropping east and west of the stretch. Mr. Olver's error here is doubtless due to that fortuitous deception, perhaps somewhat fostered by book knowledge of a classical, but fallacious detail for the Orange Grove Beds. Not only is the duplication, here alleged, non-existent; but, amongst the numerous local dislocations, there is no line of faulting trending in a direction at all consistent with the author's prolongation of the Witpoortje Fault. We are thus left with no substantial evidence of that prolongation.

DEEP ORE BODIES.

The Decrease in Value with Increasing Depth Discussed—Some Important Considerations.

The following interesting paper on this subject has been contributed by Mr. F. Lynwood Garrison to the *Journal of the Canadian Mining Institute*:—Anyone who has kept in touch with the trend of development in metal-producing and especially precious metal-producing districts, must have noted with interest the repeated instances of discoveries of ore-bodies at relatively deep points in old mines, thus instilling new life to the neighbourhood and affording encouragement to operators of mines similarly situated to explore and extend their deeper levels. In directing attention to this important subject it must be recognised that the matter is one whose inherent difficulties may not be lightly disregarded and one in which unwarranted deductions might be drawn for promotion purposes or to deceive. It is but proper to say at the outset that payable ore deposits do not usually persist in great depth, in fact, in a geologic sense, they are essentially superficial phenomena. It is true mineralized fissures are known to extend to depths of 6,000 feet and probably much more, but it seems likely they will seldom be sufficiently rich to pay. In this paper the author only contemplates such veins as have had their mineralized contents deposited by filling or replacing along fissures through which the metal-bearing waters and vapours have supposedly circulated. Instances of the discovery of new deep-seated ore shoots are not uncommon in well-established metal-producing districts where systematic exploration and development are being carried on. A number of such cases might be cited, including the famous Comstock and some of the old mines on the Mother Lode in California. At Guanajuata, Mexico, the lower reaches of the Valenciana lode on the "Veta Madre" are to be tapped at a vertical depth of 2,000 feet below the collar of the Nueva Luz shaft, and about 3,300 feet on incline from the top of the old Valenciana shaft, by new workings with a reasonable assurance of finding large bodies of payable ore. It is evident there exists among experienced mining people a belief that in profoundly mineralized regions, it is reasonable to expect the deep sections of great vein systems will continue to yield abundantly of their treasures whenever the costs of exploration and extraction are not prohibitive. According to H. C. Hoover at Kalgoorlie, West Australia, there are several properties upon which ore bodies have been discovered in depth where none or but small ones existed at the surface. In another instance in this district a marked increase of value has been noted with depth. Recent experience at Tonopah, Nevada, tends to show a decrease in value with depth with a compensating tendency to wide lateral extent of pay ore in the veins, limited only by the characteristic block faulting of the district. However, it is not to be inferred from this that a vein or lode or series of veins are necessarily continuous laterally through the full extent of such a block. Evidently such is not the case, for the veins appear to cease laterally as they do in depth even before being cut by a fault or intrusive dyke. But the practical point in this instance is that the chances of finding ore are overwhelmingly greater in lateral exploration than in vertical. It would seem that the deep underground circulation which concentrates metallic minerals at convenient voids in quantities sufficiently large to pay for extraction is both upward and lateral, and that both seepage and capillary circulation contribute no small increment. That the metals now found in deep-seated ore deposits were derived wholly from indefinite depths is a theory difficult of complete acceptance, in view of the persistent and extensive mineralization usually encountered as incidental constituents of magmatic rocks, usually closely associated with precious metal deposits. Anyone who has studied the precious metal deposits of our south-western states and territories, of Mexico and especially in the great Andean region of Central and South America, must have been impressed by the highly mineralized character of the accompanying igneous rocks. To assume as probable a leaching of the metallic minerals contained in such rocks by aqueous solutions circulating laterally through them, by capillary attraction in the massive, and by seepage and flow in the fractures, followed by a subsequent deposition of the metallic burden in the adjacent voids or by replacement of rock and associated minerals, seems but a natural and logical conclusion. It is true that with the exception of iron the amount of metal found by analysis in such rock is usually exceedingly small, but we must realise that the volume of these rocks is very great compared with the size of the ore deposits, and that time reckoned by the geologic calendar is very long. The old German miners recognised the value of pyrite as an indication of the proximity of ore; they gave the name "fahlbands" to zones or belts of pyritized country rock, and observed that fissures intersecting such zones are usually locally enriched. Among the minor causes of enrichment of ore deposits near the surface is the mingling of solutions from cross fissures. Van Hise attributes the principal cause of ore shoots to them and it is indisputable that at such intersections ore bodies are common. But it does not appear that bonanzas or local enrichments in deep lodes are necessarily dependent upon such influences, in fact, deep-seated ore shoots are generally characterised by comparative dryness. As a rule the deeper one goes the less water there is; in other words, it would seem in most instances that after a certain level has been passed the amount of water encountered varies in inverse ratio with the depth, the deepest workings being the dryest. The most serious difficulties to overcome in deep mining are threefold—hoisting, high temperatures and rock pressure. The mechanical problem of hoisting from depths of 5,000 feet is probably the least of these, and has been pretty well worked out in South Africa, and at the copper mines of Lake Superior. When such shafts depart from the vertical in part of their course the best practice seems to be to hoist in stages. The normal increase of rock temperature with depth is a more serious matter, although so far it has been capable of control, for while there is a steady rise of something like 1° Fahr. for each 208 feet (beginning with an average of 60° Fahr. at surface) of depth in the South African gold mines and 1° Fahr. for each 103 feet in the Lake Superior copper mines, good ventilation overcomes much of the discomfort from this source. The increase of rock pressure in deep workings is probably the most serious difficulty of all, one likely to make the methods of supporting the roof increasingly costly with depth. It seems likely that steel and concrete and especially waste rock filling may be used in such instances to marked advantage, where in higher levels timber would suffice. One thing is certain, that in most cases, whatever methods are adopted, the expense is likely to increase out of all proportion to the profits. Moreover the outlook for a decrease of cost in this respect is not hopeful, unless it be in the direction of flushing with tailing and sand and fine dump material. These methods or at least schemes of a somewhat similar character have been carefully studied and used in the anthracite coal district of Pennsylvania and in the gold mines of the Transvaal.

UNION BANKING STATISTICS: SOME STRIKING FEATURES.

The Dearth of Capital Illustrated—Increasing Demand for Accommodation Outdistances Deposits—Why Government Loans Should Not Be Raised Locally.

A STUDY of the Bank returns, which appear in the *Government Gazette* periodically, reveals the fact that a striking change has come over monetary conditions in this country during the last two years. The following table will show how the principal figures—each item representing the aggregate for the Union—have fluctuated during the last seven years.

Year ended 30th June.	Notes in Circulation.	Fixed Deposits.	Floating Deposits.	Local Discount and Advances.
1906 ...	£2,234,552	£15,141,055	£18,808,141	£27,982,114
1907 ...	1,920,940	15,151,877	15,726,137	25,390,679
1908 ...	1,679,963	15,433,906	15,167,568	22,347,575
1909 ...	1,809,953	14,196,559	16,533,154	21,831,728
1910 ...	2,239,410	14,079,129	18,587,171	24,180,232
1911 ...	2,463,206	13,769,860	20,020,370	27,683,252
1912 ...	2,218,995	15,079,614	18,717,121	30,431,736

The year 1906 has been chosen as a starting point because conditions were then normal; and the policy of restriction in regard to accommodation which bankers were then adopting had not had time to seriously affect the figures. The decline in the note circulation and floating deposits which continued until 1908, corresponded with a decline in trade. As regards the note circulation, about 50 per cent. of the present total is represented by the Cape Legal Tender issue. As the Cape notes are only issued against specific securities, all the banks have not availed themselves of the privilege of issue, and the system has not therefore shown itself quite as elastic as the unrestricted issues of the other Provinces. Some bankers therefore feel that the Union Government, when legislating on this point, should remove the restrictions which the Bank Act of 1891 imposes on the Cape issue, and thus contribute to a general increase of the circulation of the Union. The most noticeable fact in the foregoing table is that fixed deposits more than maintained their level, while the other figures—especially discounts and advances—fell rapidly. This was no doubt due to the banks' restrictive policy, which placed a check on overtrading and speculation; as well as to the comparatively high rate of interest, which drew more money into the banks than the latter could suitably dispose of. When deposit rates were, later, reduced, fixed deposit figures started on the downward grade just as other figures showed a tendency to improve. This, then, is the key to the situation: the banks must provide for a reasonable margin between the total deposits and advances. If there is a sufficiency of floating deposits, no manipulation of rates is necessary to attract fixed deposits: and if a keen demand for accommodation coincides with a dearth of floating deposits, rates must be raised sufficiently to attract fixed deposits. It will be seen from the table that the task of regulating the margin between these two sets of figures has been a difficult one, for much of the capital lying idle in the country between 1906 and 1909 flowed into the hands of bankers who could not dispose of it suitably in South Africa. Deposits exceeded advances by £5,967,082 in 1906, and by £8,897,985 in 1909; and owing to the lack of means of investment locally, large portions of these surplus funds were transferred by bankers for investment on the London money market. Glancing now at the figures subsequently to 1909, it will be observed that advances and discounts have increased in a much greater ratio than deposits; that while the latter are slightly less than the figures for 1906, advances and discounts are more by about 2½ millions. Deposits exceed advances now by only £3,364,999—very little more than half the sum representing the margin in 1906. The margin is dangerously low now, which fact seems to suggest that bankers have done their best during the last year or two to supply the increasing demand for accommodation, relying on an increase in deposits to support them in this purpose. Floating deposits do not show any tendency to swell, owing to the great demand for ready money in various branches of trade. The only alternative is therefore to tempt fixed deposits by means of high rates, but even this method has only proved partially successful, for the total is less now than it was in 1906. These facts point pretty clearly to the dearth of capital in this country at the present time. Several references were made to this fact in Parliament during the closing weeks of the recent session; and one or two members urged the Government to refrain from its purpose of raising a loan locally, as such a method would prove harmful by diverting capital from channels where it is doing useful service now. It is clear that if the demand for accommodation continues to increase, banks will be unable to dole out supplies in the same liberal manner as formerly, unless deposits increase substantially. We may therefore be faced with another period of restriction. The Transvaal is the great feeder of the Union in the matter of deposits, but not to the same extent as formerly. As compared with seven years ago, deposits of that Province are now £900,000 less, and advances £1,000,000 more. The most remarkable changes have occurred in the Orange Free State, where, in the course of seven years, the advances have increased from £1,864,180 to £3,981,760, while deposits have declined by about £300,000. The following table shows the figures for each Province as at June 30th last:—

Province.	Notes in Circulation.	Fixed Deposits.	Floating Deposits.	Advances, &c.
Cape	£1,176,588	£5,757,070	£6,538,352	£10,867,661
Transvaal ...	681,885	6,929,959	8,275,038	11,798,434
Natal	139,374	1,644,006	2,717,565	3,783,881
O.F.S. ...	221,148	748,579	1,186,166	3,981,760

A New Coalfield.

At a meeting the other day of the Mossel Bay Chamber of Commerce, Mr. D. Gurling Pritchard read a report on the recent coal field discovered by Mr. M. Versfeld, on a farm in the district of Riversdale, which farm Mr. Versfeld had the option of purchase, and on which some work had been carried out. To properly place the proposition before the public, said Mr. Pritchard, it would be necessary to carry out still further development, in order to prove the proposition, and to effect this shafts and drives would have to be made to some considerable extent. To carry these works out it was essential that a strong syndicate should be formed; the amount likely to be required would be about £3,000. Letters were also read from Mr. F. Dawson, General Manager of the N.C.C. Railway, and the Chief Engineer of the s.s. Australind, both of whom wrote in the highest terms of the calorific value of the coal placed at their disposal for testing.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Future of Rand Banket.

MR. DAVID DRAPER'S REPLY.

WHAT SOUTH AFRICA OWES TO THE GEOLOGIST.

To the Editor, *South African Mining Journal.*

Sir,—Your correspondent "Ego" has asked two pertinent question in his contribution of August 17th, re the future of the Rand banket. (1) How many geologists are there who have actually discovered at first hand a payable gold reef or other payable mine? And (2) How much does the common or garden prospector, to whom we are mostly indebted for valuable discoveries all the world over, know of up-to-date geology? With regard to the first question, geologists have a very good record for discoveries in South Africa, which "Ego" would know if he would take the trouble to read up the history of the mineral development of this country. Dr. Atherstone, F.G.S., of Grahamstown, rightly claimed to be the discoverer of the diamond wealth of the Vaal River, and he stoutly maintained, against strong opposition on the part of the diamond merchants of Europe, that this country would produce large quantities of diamonds. Dr. Sutherland, F.G.S., discovered the coal fields of Natal. G. W. Stow, F.G.S., discovered the coal fields of Vereeniging, the asbestos and crocidolite of Griqualand West, and he largely assisted in developing the diamond fields. F. W. Struben, F.G.S., claims the discovery of the Witwatersrand. Carl Mauch, geologist, discovered the gold-bearing rocks of the Eastern Transvaal and Mashonaland. Furlonge, F.G.S., discovered the tin of Swaziland. The marble beds of the Umzimkulu were discovered by Greisbach, F.G.S.; the Voorspoed diamond mine by H. S. Harger, F.G.S.; the Eland diamond mine by M. E. Frames, F.G.S.; and if "Ego" will make a few enquiries he will find out that the first diamond mine in the Transvaal, the first diamond mine in the Boshof district—the No. 1 Roberts Victor—was discovered by a geologist, and that the water supply of this town also falls to the list of geologists. These are only a few discoveries which have been freely admitted in times past by those who are not prejudiced in favour of the "common or garden" prospector. With reference to question No. 2, judging from the questions on South African geology that are put to me by my prospector friends almost every day, I should say that those who make the search for minerals their business are not only fairly well up in geology but are very anxious indeed to add to their knowledge. Are geologists to receive no credit for building up the geological science of this country? Is that not of itself a great work? Even with the risk of being called egotistical by "Ego," I may state that I have been a pioneer in every mineral discovery in this country, and that I wielded a pick and shovel, probably many years before "Ego" was born, and that I am not an F.G.S. There are many other points in "Ego's" contribution that I might answer, but as I am leaving Johannesburg in a day or two, I have not time at present, though I should just like to note that when a critic has not the pluck to sign his name to an article, he generally makes use of personalities and false statements to prove his arguments. So far as I am concerned, the correspondence will now cease.—I am, etc.,

DAVID DRAPER.

Approximate Losses of Gold and Zinc

IN THE ZINC-SULPHATE SOLUTION BY THE PRINCIPAL GROUPS OF MINES ON THE RAND.

To the Editor, *South African Mining Journal.*

Sir,—My attention was called to the importance of the value of the losses incurred by the gold mines in gold and zinc in the zinc-sulphate solutions, by Mr. M. Torrente, the well-known consulting metallurgist of the Rand, in 1905, and by a book published by Mr. Francis L. Bosqui, entitled "Practical Notes on Cyanide Process." But the losses, particularly in gold, in the form of salts, have been overlooked by some metallurgists. The mines appeared to have been satisfied to extract only the gold obtained by settling. All the processes tried till now for precipitating zinc with other metals than aluminium have been unsuccessful or too costly. As sodium carbonate or magnesia are used to precipitate zinc from aqueous solution, a bulky precipitate very difficult to wash and handle is produced. The residue contains iron-oxide, lead-sulphate, gold and silver in a finely divided condition difficult to smelt. By my new automatic ultra-violet rays process, all the gold is extracted in a pure state; likewise the zinc salt. I have made an improvement in my plant since 1910, which allows day and night working. Results from trials made on some mines prove that the gold lost is proportionate to the zinc used, independent of the richness of ore treated, and the amount is about 2·5 ozs. per ton of metallic zinc used. The number of tons of water for washing the zinc salt being different in each mine, according as warm or cold water is used, the calculation of the losses by the number of tons of metallic zinc used is more accurate. The number of tons of metallic zinc put for each group is approximate; the price of zinc salt has been quoted at £8 the ton, and the ounce of gold at £4.—I am, etc.,

PROF. G. JACQUIER, B.Sc.

APPROXIMATE LOSSES OF GOLD AND ZINC IN THE ZINC SULPHATE SOLUTION BY EACH GROUP OF THE GOLD MINES OF THE RAND.

Group.	Zinc. (Metallic used.) tons.	Zinc. (Salt recovered.) tons.	Value of Zinc Salt per ton.	Gold. ozs.	Value.	Total Cost.
Central Mining ...	1.200	3.600	£28.800	3.000	£12.000	£40.000
Gold Fields	763	2.289	18,312	1.900	7.600	25.912
Randfontein Central and Langlaagte ...	725	2,175	17,400	1,810	7,240	24,640
East Rand	600	1.800	14,400	1.500	6.000	20,400
General Mining ...	380	1.140	9.120	950	3,800	12,920
Neumann	360	1,080	8,640	900	3,600	12,240
Barnato	370	1.110	8.880	925	3.700	12,580
A. Goerz & Co. ...	168	504	4,032	420	1.680	5,712
Cons. Mines Selection	132	396	3.168	330	1.320	4.488
Kleinfontein Group	122	366	2,928	305	1,220	4.148
	4,820			12,040		£163,040

High Mining Salaries

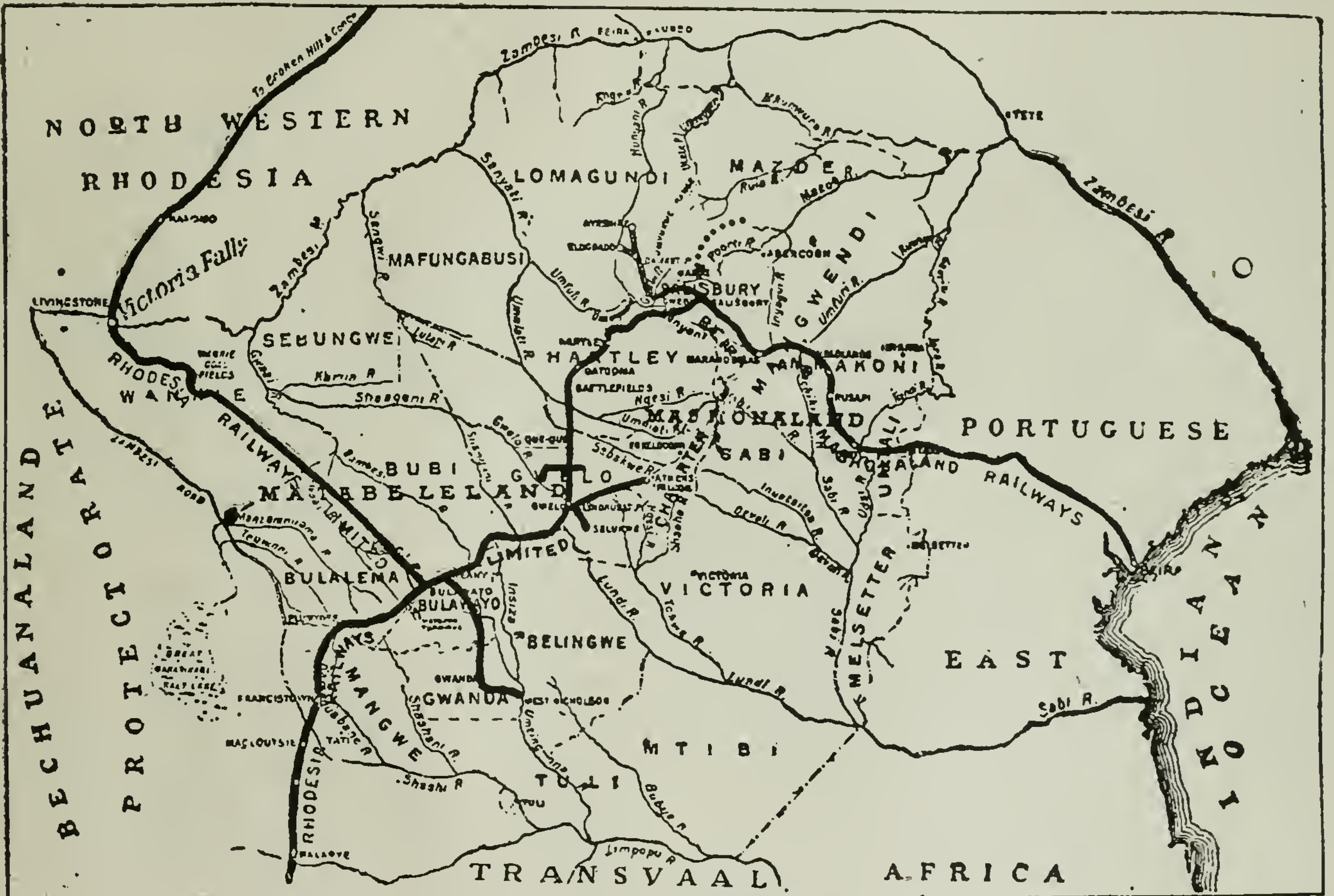
EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 10, Anglo-Austrian Buildings; Box 2061.

Rhodesian Section.

LATEST MINING NEWS.

The Enterprise Tin Area—Rhodesia Copper Company—The Northern Copper Report—Bushtick's New Plant—The Wanderer's Year—Future Policy at the Antelope.

Great activity is being displayed in the Enterprise tin area, Mashonaland, and it would appear that important developments are taking place there. A number of additional claims have been pegged on behalf of some very strong Johannesburg people, and it is reported that a highly important discovery has been made. The question to be determined is whether the lode, from which the "float" over the whole of the Enterprise tin belt comes, has been discovered. One of the ablest mining engineers that South Africa possesses is on the spot, making final investigations, the result of which will probably be made known in the course of next week.



Map of Rhodesia, showing Principal Mining Districts.

* * * *

The directors of the Rhodesia Copper and General Exploration and Finance Company, Limited, report for the year ended May 31 last that at that date the cash at bankers and in hand amounted to £31,732, and £50,000 was on loan against approved securities. The company holds large interests, amounting to about 400,000 fully-paid shares, in the Bwana M'Kubwa Copper Mining Company, Kafue Copper Development Company, and Rhodesia Broken Hill Development Company. The whole of these share interests stood in the accounts at May 31 at £156,790. The Bwana M'Kubwa copper mine is now rapidly approaching the producing stage. The profit and loss account at May 31, 1911, showed a credit balance of £10,780, from which has been deducted the balance shown to the debit of the account for the year ended May 31 last, viz., £558, leaving £10,222 to the credit of the account.

* * * *

The directors of the Northern Copper (B.S.A.) Company, Limited, report for the year ended May 31 last that at that date the cash at bankers and in hand amounted to £4,160, and there was on loan against security £43,000 and shares sold but not delivered £4,210, making a total of £51,370: £31,212, secured on the output of copper matte, had been advanced to the Kafue Copper Development Company, which addition makes a total of £82,582. Share interests stood in the accounts at May 31 at £116,120. In addition, the company holds shares and debentures amounting to £9,941, making a total of £126,061. The profit and loss account at May 31, 1911, showed a credit balance of £4,059. To this has been added the profit for the year ended May 31 last, viz., £1,182, making a total of £5,241 to the credit of the account.

* * * *

The following official statement has been issued in connection with the reduction plant of the Bushtick Mines, Ltd.:—On the 3rd August, the 20 stamps, which have been re-conditioned, and the large 16ft. by 5ft. 6in. tube mill were brought into commission. The stamps have a running weight of 1,250lbs., and are giving a duty of approximately 10 tons per stamp per day.

* * * *

Mr. Noel Griffin, the company's consulting engineer, makes several interesting comments in his report (dated May 25th) on the Wanderer Mine. *Inter alia*, he states:—Mine development: The supply of labour having been good, advantage was taken of it and 2,318 feet of sinking, rising and driving was accomplished more than in 1911. In spite of this the ore reserves were decreased by 73,270 tons. In 1911 the total footage was 6,329 feet; cost per foot, £1 1s. 7d.; total cost, £6,830 2s. 11d. In 1912 the total footage was 8,647 feet; cost per foot, £1 0s. 10·3d.; total cost, £9,018 7s. 3d. Ore reserves: The following are the ore reserves, as estimated by the mine manager—Wanderer, 66,942 tons; Camperdown, 151,997 tons: Kemerton East, 38,720 tons; Kemerton West, 4,164 tons: Ashton, 89.102 tons; total, 350,925 tons. It would seem more than likely that during the coming year a reduction in expenses will be effected due to an increased efficiency. The very short wet season this year has been a great help, and it is hoped that by careful planning the work during this dry season that the serious effects of heavy falls of ground and flooding may be minimised during the next wet season. The developments in the Wanderer mine on the 70-feet and 140-feet levels are encouraging and it is possible that by continuing active development both on the known ore bodies and those parts of your property that are still unprospected, the ore reserves may be maintained in a satisfactory condition.

* * * *

At the annual meeting of the company, held in London the other day, the Chairman remarked: " The result of our year's operations is not nearly so good as we had expected. A much larger tonnage has been treated than in any previous year, and the working costs stand at quite a satisfactory figure; but the gold produced is about £4,000 less than last year, when a much smaller tonnage was treated. This is due to the fall in the grade of the ore, the difference being about half a penny-weight, which, on the large tonnage, naturally makes a considerable difference. The ore reserves were calculated by the late manager to amount to 350,925 tons at April 30 last, and were, therefore, about eighteen months ahead of the mill. You will notice there have been changes in the consulting engineership and in the mine managership. Messrs. Percy Tarbutt and Co. were closing their office in Rhodesia, and therefore terminated their agreement with us, causing us to lose the services of their representative, Mr. Franklin White. In their place we have appointed the Charterland and General Exploration and Finance Co., Ltd., and that company acts in Rhodesia through its consulting engineer, Mr. Noel Griffin. Mr. Griffin has been known to some of us for some years, and we consider he is well fitted for the post, and that he will do his utmost to obtain for this company the best results at a minimum cost. Mr. Little, our manager for ten years past, has resigned his position, and we have appointed in his stead Mr. Wiley, who comes to us with excellent recommendations. There are changes in the constitution of the Board, Mr. Tarbutt has resigned, owing to his frequent absences abroad for considerable periods, and we have filled the vacancy by the appointment of Mr. J. E. H. Lomas, and though the Board have the power to make that appointment themselves, in view of the meeting being so close we thought it desirable to make the same subject to your approval. We are sure that, if elected, Mr. Lomas, who knows South Africa well from long residence, will prove a useful addition to the Board.

* * * *

Presiding at the annual meeting of the Antelope Gold Mine, Mr. R. G. Fricker remarked of the future policy of this company:—It is intended to sink the main shaft with all speed, as it will be necessary to open up two levels each year to feed the reduction plant, which it is proposed to erect; and as during the year a compressor plant has been installed, development can be pushed ahead at a greater pace than hitherto. At the last annual meeting the shareholders were informed that the question of erecting a reduction plant was being considered by the board. There has been unavoidably a good deal of delay in deciding upon the type of plant by which the ore in your mine can be most economically treated, and tests and experiments have had to be carried out to enable the board to decide upon the most suitable type of plant. A report was made by Mr. Brett (our metallurgical adviser in Bulawayo) containing his recommendations, and after due consideration it was thought best to await the arrival of Mr. Piper, who was expected in England, before definitely placing the order for the necessary machinery. We have now had an interview with Mr. Piper, and have decided to adopt those recommendations, and the necessary plans and specifications have been got out and tenders will be called at once for the required plant. The nature of the ore rendered an ordinary milling and cyanide treatment impossible, and the experimental results of concentration were disappointing. It has therefore been settled to erect a dry-crushing and all-roasting process. The advantages of this are particularly discernible in the case of the Antelope, owing to the scarcity of water, while, of course, a high extraction is assured. The plant to be erected will treat 4,000 tons a month, and will consist of crusher, two ball mills, four Edwards' furnaces, ten grinding pans and amalgamating pans, with two five-ton filter presses. The estimated cost is £60,000. The average assay value of the ore developed is a little over 10 dwts., after reducing high values, from which it is estimated an extraction of 95 per cent. will be made. This is the estimate made by the metallurgist, Mr. Brett. Working costs are put down at about 25s. per ton, so that we may expect a profit of from 12s. 6d. to 15s. per ton treated. Mr. Brett's estimate was about £3,100 per month. That, gentlemen, deals with the mine and the plant, and I hope that before our next annual meeting we may be in a position to tell you that not only has the plant started running, but that we are in receipt of a good revenue. The report and accounts were then adopted.

Bucks Reef.

The following are particulars of last month's working results, viz.:—Tons crushed, 875; yield, £1,960; profit, £133 15s. 5d.

Falcon Mines

Speaking at the annual meeting of the Falcon Mine, held in London the other day, Major Frank Johnson, in speaking of the metallurgical policy of that company, stated: Their consulting engineer (Mr. H. A. Piper) expressed an opinion against the desirability of shipping the unit, and recommended that their metallurgist (Mr. Th. Kapp) should proceed to the mine to study on the spot the quality and supply of iron ore and other necessary fluxes. Mr. Kapp accordingly proceeded to Rhodesia, where he had had the advantage of discussing many technical details, not only with Mr. Piper, but with Mr. Brett (the company's consulting metallurgist), and as a result those experts had unanimously advised the board not to waste time and money on the erection of a unit of the plant, but to proceed with the immediate provision of a plant capable of treating not less than 180,000 tons of ore annually. The cost of that plant was estimated at £210,000, to which another £100,000 had been added to provide for a new main shaft and such a water supply as would ensure the future working from any delay in the face of even abnormal droughts, together with the cost of continuing development on the present scale during the interval of 15 to 18 months which must elapse before the completion of the large plant.

GLOBE AND PHOENIX ORE RESERVES.

Reduced Value of Development—Hartley Activity.

Some anxiety appears to be felt in London and Rhodesian financial circles as to the Globe and Phœnix, particularly in regard to the value attached to the latest estimate of reserves. This estimate shows a reduction of nearly 5s. per ton, and this notwithstanding the lower grade of ore crushed during the period. This reduction in grade of ore milled is larger than shown in the figures given above, for the reason that £15,470 of the revenue was derived from gold in reserve. Allowing for this, the grade of the ore milled in the June quarter was 118s. 5d., against a grade of the ore milled in the previous quarter of 201s. 11d., which included the value of the gold added to the reserve in the period. Looking at the latest ore reserves estimate in the light of these figures, it will be apparent that the value of the ore developed in the June quarter was much lower than the value of the ore developed in the previous three months.

Activity at Hartley.

The Hartley district has been well named the home of the small worker. Although numbers of properties in this locality have passed out of the hands of tributors and workers on a leasehold basis into the hands of limited liability companies, there is to-day quite as much activity being displayed amongst small workers and tributors as in the past. Development work is proceeding on several new properties, and on a number of these reduction plants are in course of erection. Altogether, the prospects of an increasing output in the district are very good. On the Kyrenia Primrose, about three miles south of the Golden Valley claims, and now held by Mr. T. Mack on a tributing lease, a reduction plant is in course of erection, and will probably commence working some time next month, whilst at the Golden Valley mill ore from the White Rose property is being crushed. Milling operations have also commenced at the Duke Mine, and the Etna battery will start running again early next month. The Cheshire Cat five-stamp battery is now practically completed, and is due to commence milling on September 1st under the management of Mr. Tarener.

New Rhodesian Company.

NEW FULL BACK GOLD MINING SYNDICATE.

Registered July 24, with a capital of £6,000 in £1 shares, to carry on the business of gold and general miners, prospectors, explorers, etc., to acquire from W. B. Maris the mine workings and mining grounds, lands, and hereditaments, known as the New Full Back Gold Mine, comprising ten claims in the Salisbury Mining District, Rhodesia. Purchase consideration £3,000 in shares. Minimum cash subscription £2,500. The number of directors is not to be less than three nor more than five; the first are M. D. Bradford, F. W. Davis, and R. J. Maris. Qualification, 100 shares. Remuneration as fixed by the company. Registered by Jordan and Sons, Limited, 116-117, Chancery Lane, London, W.C.

City Deep.

The directors submit the estimated financial position of the company as at 30th June, 1912, as reflected in the interim balance sheet, working expenditure and revenue account for the quarter, and appropriation account (subject to audit), also particulars of the quarter's development, reduction operations, etc. Working expenditure and revenue account for the quarter ending 30th June, 1912. To mining expenses: Mining, £86,523 (14s. 5d. per ton); development redemption, £17,914 (3s. per ton); total, £104,437 (17s. 5d. per ton); to reduction expenses, £27,535 (4s. 7d. per ton); to general expenses, mine, £6,441 (1s. 1d. per ton), head office, £4,104 (8d. per ton); total working expenditure £142,520 (23s. 9d. per ton); to working profit carried down, £71,555 (11s. 11d. per ton); by gold account, £214,075 (35s. 8d. per ton.) Interim appropriation account (subject to amendment): To Government Tax (estimated), for three months ending 31st March, 1912, £5,283; for three months ending 30th June, 1912, £6,859—£12,143; to French Fiscal Taxes: For period ending 31st March, 1912, £2,350; to balance carried to balance sheet, £150,617; total, £165,109. By balance brought forward 31st December, 1911, £29,738: by balance of working expenditure and revenue account: For three months ending 31st March, 1912, £60,760; for three months ending 30th June, 1912, £74,611—£135,371; total, £165,109. The profits appropriated in the last quarterly report, amounting to £11,140, have been reversed. The credit balance of appropriation account is not wholly available for distribution, as the amount of capital expenditure for the six months ending 30th June, 1912, £11,691 for new construction and £3,280 in respect of annuity for undermining rights have not yet been appropriated. The amount to be appropriated for these sums will not be determined until the end of the financial year. Development Work: Number of feet driven, sunk and risen, exclusive of stopes, 5,075 feet; the reef disclosures were as follows: Main Reef Leader, distance exposed, 3,470 feet; width, 20 ins.; assay value, 105s. 3d.; South Reef, distance exposed, 35 feet; width, 16 ins.; assay value, 24s. 9d. Reduction Works: Ore received from mine, 115,998 tons; ore received from surface dumps, 26,712 tons; total, 142,710 tons; waste sorted out, 16.1 per cent.; tonnage crushed, 119,900 tons; number of stamps operating, 110 stamps; number of tube mills operating, 9; value of ore before crushing (reflected by mill yield and value of pulp): Mill yield per ton, 23s. 7d.; assay value of pulp, 12s.; total, 35s. 7d. (The value per ton is calculated at 84s. per fine oz.) Total yield, 51,014 ozs. fine; total yield per ton, 35s. 9d.; accumulated slimes, tonnage treated, 6,900 tons; accumulated slimes, yield, 845 ozs. fine. General.—The capital expenditure for the quarter was as follows: Expended on equipment, £1,637 6s. 7d.; expended on vertical shafts (stations, pump chambers, etc.), £553 14s. 8d.; net expenditure for quarter, £2,191 1s. 3d. The estimated tonnage of payable ore fully developed for the six months ended 30th June, 1912, was 88,189 tons, value 47s.. In addition it is estimated that 170,000 tons of payable ore have been exposed, which will be fully valued and credited to development when completely blocked out. The underground breaking efficiencies have shown a considerable improvement. The tonnage milled represents a small increase, although the tonnage taken from the dump was 23,376 less, thus indicating a creditable increase in the ore mined for the quarter. The profits earned during the last five months show a progressive increase from month to month, although the development redemption rate has been increased from 2s. per ton milled to 3s. 6d. per ton milled from the mine. Sinking has been commenced in the east and west inclines at No. 2 shaft. The 4th and 10th levels, which are opening up new ground on the rise and dip sides respectively, exposed ore of good grade, and generally the Main Reef Leader development values all over the mine continue satisfactory. Shareholders have been advised through the Press that an adverse judgment was given on 28th June, 1912, in the action brought by the Federation Company against our predecessors in title. The Federation Company has lodged an appeal against this decision and has applied to the Court for a postponement of the action against the City Deep until their appeal is decided. The appeal should be heard in September or October next.

Voorspoed Diamonds.

Numerous reports are in circulation as to the future of the Voorspoed mine. One statement has been that De Beers Consolidated have acquired the mine, taken over all liabilities, and guaranteed shareholders a 2½ per cent. dividend. This report, we are officially informed, is not true. The board will make a statement as to the future of the company at an early date.

Wanted a Partner.

An interest in Five Gold Mining Blocks on Eiffel Flats is offered in return for 100 feet of sinking on reef below water level. Lode is closely correlated, both geologically and mineralogically to well-known Motor, and is situated at head of same vlei.

Apply "PARTNER" c/o this office.

TRACKLESS TRAMS.

The "Cedes-Stoll" System—As Used in Paris, Berlin, Vienna, and New York.

In our issue of last week we described the Railless Electric Traction Co.'s system of trackless trams. The Railless Electric Traction system was the one first adopted in England, but there are other systems which have been in use previously for a number of years on the Continent. Of all systems of trackless trams in operation the "Cedes-Stoll" system has received perhaps the most general adoption. The "Cedes-Stoll" system of trackless trams was originally manufactured exclusively by the Austrian Daimler Co., the well-known motor car manufacturers, at their works near Vienna. An English company, "Trackless Trolleys, Ltd.," has, however, now been formed, and the complete equipment is manufactured at their works in London. The name "Cedes-Stoll" is a combination of the words Mercedes and Stoll, the Austrian Daimler Co. having manufactured the Mercedes Petrol Electric Motor Car, which had the special wheel motor used in the "Cedes-Stoll" system, and Stoll being the name of the inventor of the patent overhead gear. The "Cedes-Stoll" may practically be described as the pioneer system of trackless trams, the first line on this system having been opened in Austria in July, 1907. Since this time new lines have been opened up, until at present the number of miles installed of this system is considerably greater than of any other. It is noteworthy that the principal capitals of Europe have all adopted the "Cedes-Stoll" system—Berlin, Paris, and Vienna have all got "Cedes-Stoll" trackless tram systems, and the London County Council have also experimented with it, and pronounced it entirely satisfactory, and are now applying for Parliamentary powers. In addition to these cities, this system is in use in New York and in numerous small towns in Europe.

The "Cedes-Stoll" System: Cars Passing One Another.

Unique Features.

The unique features of this system of trackless trams are the method of collecting the current from the overhead lines and the special wheel motor. The current is taken from the overhead lines by means of a small light four-wheeled trolley which runs along on top of the lines; this trolley is connected to the car by means of about forty feet of flexible cable, the slack of which is automatically wound up or let out as required by spring drum on the car, and therefore the vehicle possesses a very wide range of movement. A ball and socket joint in the current collector enables the car to describe circles underneath the trolley if required. The advantages of this method of current collection are three-fold:—(a) *Extreme Flexibility.*—The vehicle being only connected with the overhead track by a flexible cable, the car can be manœuvred at any speed in a way impossible when rigid trolley poles are employed. (b) *Reduced Wear on Overhead Track.*—The light running current collector travelling on top of the wires causes less strain and wear on the overhead line than do the stiff trolley poles with the powerful springs necessary to keep them in constant contact with the wires, that are used in some other systems. (c) *Less Wear and Tear on Body.*—The use of trolley poles means a weight of about 4/5 cwts. added to the top of the car. This, together with the pressure of the springs acting on the trolley poles, puts a great strain on the framework of the car, particularly when the car is subject to considerable shocks on bad roads.

No Gearing.

The cars are driven by two 20 h.p. motors, which themselves form the rear wheels of the vehicle; all gearing, with its consequent losses, is therefore done away with. The consumption of current per car mile is less with the "Cedes-Stoll" than any other system, as the current is used directly in these highly efficient wheel motors, and therefore all transmission losses, such as are occasioned by gearing, etc., are done away with. The cost of repairs is reduced, as there is no gearing of any kind to wear away and give trouble. Anyone familiar with motor cars in South Africa will appreciate the great advantage both in respect to reliability and to wear and tear which the absence of all gearing gives. Another advantage of this wheel motor is that in the event of an accident a new motor wheel can be put on the car in fifteen minutes, less time than it would take to get at the armature of an ordinary geared motor carried underneath the car. These motors, fixed on passenger cars, which have been running in Northern Austria since July, 1907, have now run over 100,000 miles without any attention, and according to the report of the Superintendent, are still working in a faultless manner. The success of the "Cedes-Stoll" wheel motor is further proved by the fact that in London and many of the large cities of the Continent there are innumerable "Cedes-Stoll" fire brigade appliances and ambulances. These vehicles are subjected to the severest handling, and yet in no case is trouble experienced with these wheel motors. In this connection we observe from the *Electrical Review* of July 19, 1912, that the London County Council are converting their horsed turntable long ladders to electric driving on the "Cedes-Stoll" system.

In this article we have dealt with the unique features of the "Cedes-Stoll" system, but of course it has all the advantages possessed by any railless car system, as compared with tramways or motor bus systems, *i.e.*, low initial capital cost, adaptability to traffic, economical running, etc. There is no doubt that there is a big field for trackless trams in South Africa, and we feel sure that wherever it is contemplated installing this means of transport the "Cedes-Stoll" system will merit the most careful consideration. The complete equipment is manufactured in London by The Trackless Trolley, Ltd., 112, Great Portland Street, London; works, Stamford Hill, London; whose South African agents are Hubert Davies and Co., Brown's Buildings, Loveday Street, Johannesburg.

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THE WEEK IN THE SHAREMARKET.

London Support Accorded—Corner House Stocks Advance—Improving Outlook.

The market remains firm, without any great activity. On Thursday came the long promised lead from London, and all Corner House stocks responded at once. As dealers return from holidays, interest is bound to go on increasing, and the outlook is, therefore, improving daily. On Thursday, Bantjes advanced on support, whilst the business in Modderfontein B.'s was executed at higher prices. City Deeps, Glynn's Lydenburgs, Mining Estates, and Village Deeps had business at increased quotations. Improved bids for Crown Mines and Rand Mines were unsuccessful. East Rands fluctuated. Apex mines had dealings at lower figures, but Brakpans, City and Suburbans, Main Reefs, Langlaagtes, States Mines, Knight Centrals, Main Reef Wests, Modderfontein Deeps, Coal Trusts, and Wit. Deeps were better. African Farms were higher, and Randfontein Estates were transacted at an enhanced quotation. In the small-priced shares, the market was harder. Benonis, Cloverfields, New Eras, S.R. Deeps, and Pullingers were firmer. In tin stocks, the market was quiet. Both Zaaiplaats and Rooibergs had unchanged prices, likewise Rex Zaaiplaats, Temple Tins, South African Tins and Bushvelds. In diamonds, the market was firm. Premier Deferreds were wanted at higher prices, without a seller's quotation being made. Blaauwboschs, Frank Smiths, Oranges and Roberts Victors were better. Elands, Voorspoeds and New Thors were steady. The activity is growing, and the market broadens daily.

	*	*	*	*		
	Friday, 16th.	Sat., 17th.	Monday, 19th.	Tuesday, 20th.	Wed., 21st.	Thurs. 22nd.
African Farms ...	15 3B	16 0B	16 0	16 0	15 9B	16 0B
Adair-Usher Process	...	1 6S	1 6S	1 6S	..	...
Apex Mines ...	27 6B	27 6B	30 0S	27 0S	29 6S	28 0
Bantjes Consolidated	21 9	22 0	22 3	22 3B	22 6	23 0B
Benonis	4 7B	4 8B	4 8B	4 9B	4 9B	5 0
Bushveld Tins ...	0 8	0 8B	0 8B	0 9B	0 9B	-
Brakpan Mines ...	74 6B	75 6B	76 3B	76 0B	76 0B	76 6B
British S A. ...	...	28 0B	...	...	28 0B	28 0B
Blaauwbosch ...	22 0S	24 0B	25 0B	25 0B	25 0B	26 0
Cinderella Cons. ...	...	...	22 0B	..	...	24 0S
City and Suburban ...	47 6B	...	47 9	47 6B	47 0	47 0B
City Deeps	58 0B	60 0B	60 0B	60 6B	61 0B	62 6
Cloverfield Mines ...	5 9B	6 4	6 2B	6 0B	...	6 4B
Cons. Langlaagtes ...	24 9B	25 0	24 9B	25 0B	25 0B	25 3S
Cons. Main Reefs ...	19 3	19 6B	19 6B	19 9	19 6B	19 6
Coronation Freeholds	0 6B	...	0 8S	0 8B	...	0 7S
Cons. Mine Selections	..	...	...	...	...	12 0
Con. Investment ..	...	...	21 0B	21 0B	21 0B	21 0B
Crown Mines	135 0B	135 0B	135 0B	135 0B	135 0B	136 3B
East Rand Cent. ...	12 0B	12 9	13 0	13 9	14 0	1 0
East Rand Coals ...	2 4B	2 4B	2 4B	2 4B	2 4B	2 4B
East Rand Deeps ...	2 6	2 9	...	2 9B	...	2 7B
East Rand Props. ..	55 0B	57 6B	59 0	59 6	60 0	59 3B
East Rand Deb. ...	£92½	£93	£93	£93	£93	£93
Eastern Gold Mines	1 9B	1 9B	1 10B	2 1B	2 3S	2 0B
Frank Smith Diam...	8 6B	8 6S	9 6	9 9	9 6B	10 0B
French Rands ...	...	..	..	1 6B	1 6B	...
Govt. Areas... ...	25 6S	25 9	25 6	25 0	24 0	25 3
Glynn's Lydenburgs	...	25 0B	27 6S	26 0B	26 0B	25 0B
Glencairns	4 6S	...	5 0S	...	3 6B	3 6B
Glencoe (Natal) Colls	...	...	6 0B	6 0B	6 0B	6 3B
Geduld Props. ...	...	24 0B	24 0B	24 0B	24 0B	24 0B
Jumpers	...	...	...	6 0B	6 0B	6 0B
Jupiters	10 6B	11 0B	11 0B	11 0B	11 3S	10 9B
Kaalfontein Diamonds	0 6	0 6S	0 6S	...	...	...
Klerksdorp Props. ...	3 0B	...	3 0	...	...	3 0B
Knight Centrals ...	14 6	15 0	15 0	14 6B	14 9	15 0
Luipaardsvlei Estates	7 6B	7 6B	7 9B	...	10 0	10 9B
Lace Props.	4 3	4 4	4 4	3 9	4 1B	4 0B
Lydenburg Gold Farms	2 6B	2 8B	2 8B	2 9	...	2 8B
Main Reef Wests ...	23 0	23 0	23 0	22 9B	23 3	23 6
Modder B's	66 0B	66 6B	...	66 0B	67 0	67 0B

B Buyers. S Sellers.

	Friday, 16th.	Sat., 17th	Monday, 19th.	Tuesday, 20th.	Wed., 21st.	Thurs. 22nd.
Middelvlei Estates...	...	1 7B	1 7B	1 7B	1 7B	1 7B
Modder Deeps ...	33 6	32 6B	32 6B	33 6	33 0B	33 6B
Meyer & Charltons...	...	...	...	91 0	91 0B	...
New Eras	7 6B	7 6B	7 9	8 0S	7 9B	8 0
New Kleinfonteins...	...	27 0	28 0S	26 0B	..	25 3S
New Rietfonteins ...	8 0S	8 3S	8 3S	8 0S	8 0S	...
New Unifieds ...	15 0B	17 0S	17 0S	...	17 0B	..
New Boksburgs ...	2 0S	...	...	...	...	1 6B
Nigels	17 0B	17 0B	17 0B	17 0B	18 0B	19 0B
Orange Diamonds ..	...	1 0B	1 3B	1 5	1 3B	1 4B
Premiers Deferred	207 6B	215 0B	220 0	225 0B	223 0B	230 0B
Pigg's Peaks ...	12 0B	12 0S	12 0B	12 0B	12 0B	12 0B
Pretoria Cement Co.	51 6B	51 6B	51 6B	51 6B	51 6B	51 6B
Pretoria Estates ...	...	...	...	...	17 6S	...
Paardekraal Estates	1 0S	0 6B	1 0S	0 6B	0 6B	0 6S
Potchefstroom Est....	1 0B	1 9S	..	1 9S	2 0S	1 3B
Princess	9 9B	9 9B	9 9B	9 9B	9 9B	9 9B
Rand Nucleus ...	3 0B	3 2B	3 2B	3 2	3 2B	3 3B
Randfontein Estates	28 6	28 3	28 0B	28 3S	28 3B	28 6B
Randfontein Deeps...	4 3B	4 3B	4 3B	4 3B	4 3B	4 3B
Rooiberg Minerals ...	30 0B	30 0B	30 6	30 3	30 0	30 0B
Rand Klips	4 3	4 6	4 6B	4 6B	4 5B	4 4S
Ryan Nigels ...	3 9B	3 9S	3 9B	3 9B	3 9B	3 9B
Roberts Victors ...	15 6B	16 3B	18 0B	20 0B	22 6B	21 0S
Simmer Deeps ...	2 6B	3 3S	...	...	...	2 6B
South African Lands	4 3B	4 3B	4 6	4 4S	4 4S	4 4B
S. Randfontein Deeps	...	...	...	...	3 3B	3 6B
Sub Nigels	6 0B	6 3	6 3B	6 3B	6 0B	6 0B
Springs Mines ...	...	15 0B	...	14 0B	14 6S	14 0B
S. A. Breweries ...	40 0S	..	...	...	...	40 0S
Trans. G.M. Estates	47 0	47 0	46 3B	46 6B	46 6B	47 0B
Temple Tins	...	4 0	4 0	3 11B	3 6B	3 9S
Trans. Coal Trusts...	45 6B	45 9	45 9	45 9B	45 6B	45 6
Tudors	...	...	1 3B	2 0S	...	...
Van Ryn Deeps ...	18 6	18 6	18 3B	18 0B	18 0B	18 3
Village Deeps ...	40 0B	40 6B	40 0B	40 3B	40 6B	40 6B
Vogel. Cons. Deeps...	1 0B	...	1 0B	...	...	1 0B
Voorspoed Diamonds	10 0B	...	...	10 0B	...	10 0B
Van Dyks	...	2 0B	...	2 0B	...	...
Witwatersrands ...	55 0B	56 0B	55 0B	56 0B	57 6S	57 6B
Wolhuters	21 0	21 0B	21 0	20 6B	20 0B	20 9
Witbank Collieries...	45 0B	45 0B	45 0B	...	46 0B	...
Wit. Deeps	54 0S	52 0B	52 0B	52 0B	52 6B	53 0B
West Rand Est. ...	2 9B	2 9B	2 9B	2 9B	2 10B	3 0B
West Rand Con. ...	...	12 9B	...	12 9B	12 9B	13 0B
Wit Townships ...	..	...	...	...	23 9B	...
Zaaiplaats	37 6	36 6B	36 6	37 0	36 6B	36 6

B Buyers. S Sellers.

The Council of the Institution of Municipal and County Engineers, London, have elected Mr. W. Ingham, M.Inst.C.E., M.I.Mech.E., Chief Engineer, Rand Water Board, to be chairman of the South African Section of the Institution. Mr. Ingham joined the Institution of Municipal and County Engineers in 1891, in which year he came first at the examination held in Manchester.

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Engineering Notes and News.

Rhodesia Railways New Equipment.

Eighteen new engines and tenders have recently been shipped to South Africa to the order of the Rhodesia Railways, Ltd., by the North British Locomotive Co., of Glasgow. They are the largest engines running on the Rhodesia railway system. The total weight of the engine and tender in working order is 108 tons 1 cwt. They are of the 4-8-0 type, attached to tenders having two four-wheel bogies; are fitted with Schmidt superbeaters and Walschaert gear. The tubes, superheater and fire-box give a total heating surface of 1,193·33 sq. feet. Both engines and tenders are fitted with steam and automatic vacuum brakes.

Danger to Birds and Airmen from Electric Wires.

Engineering says that overhead electric wires are responsible, according to information collected by the Saxon Bird Preservation Society, for the following loss of bird life in a distance of three-quarters of a mile of such wire:—Sixteen hawks, three buzzards, three owls, two starlings, and six others; whilst, in another instance, eight hawks, four barn owls, two marsh owls, two buzzards, many jackdaws, and a great number of starlings were electrocuted. So much is this the case that birds of prey know the line as a hunting-ground, and themselves suffer the common penalty; and it is feared that many species will be quickly exterminated by high-tension wires. The danger to human life continually manifests itself, and the latest phase is that to passengers in airships, especially while descending to earth. The rope drags across the wires, and a spark therefrom sets the gas off, and brings down the balloon in flames. This is given as the explanation of the disaster which happened to the military airship of Strassburg. Aeronauts view this source of trouble with apprehension, and, in the opinion of Dr. Flemming, expressed in the year-book of the German Airship Association, the remedy can only be found by laying the electric mains underground.

Slotted Screening and Its Use on the Rand.

A week or two ago we drew attention to the fact that the Village Deep crushed 52,000 tons during last month, which constitutes a record milling achievement for this company. The maximum capacity of the battery was fixed at 50,000 tons per month, and that this should have been improved on to the extent of 2,000 tons was deemed a highly satisfactory achievement. In no small degree is the high crushing result secured at the Village Deep and other mills due to the employment of what is known as "Ton-Cap" screening. In many Rand batteries this screening is giving results that are not to be obtained by the use of the ordinary square mesh battery cloth. Ton-cap screening is a woven wire slotted screen manufactured by the W. S. Tyler Co., Cleveland, Ohio, U.S.A., and they claim that Ton-Cap will give a stamp battery an increased tonnage capacity as compared with square mesh screening. Results obtained on the Rand, and especially in batteries where tube mills are employed, appear fully to bear out the contention of the manufacturers. The first mill on the Witwatersrand to employ Ton-Cap screening was the Roodepoort United Main Reef, and for the two years that the mill has run on this screening it has held the record stamp duty for the Rand, the average being over twenty tons per stamp per diem. Good reports have also been received from the Robinson, the Crown Mines, the Geldenhuis Deep, Village Deep, City Deep, Bantjes, Brakpan, New Modderfontein, Modderfontein B, Geduld, Van Ryn, Durban Roodepoort, and East Rand Proprietary mills. It is claimed that the Ton-Cap screening lasts from five to ten times longer than the ordinary square mesh screen.

Trackless Trams versus Motor Omnibuses.

FEEDERS FOR TRAMWAYS: PROF. DOBSON'S VIEWS.

Professor Dobson, electrical engineer for the Municipality and general manager of the tramways, has submitted to the Town Council an important report on the future of tramway extensions. After reviewing the development of the municipal tramways, and indicating the demands for new extensions, Professor Dobson emphasises the need of financial caution, and then, in order that the Tramway and Lighting Committee might be able to deal adequately with the subject, he had endeavoured to study other cheaper systems of communication which might act as feeders to the present tramway services. Railless electric traction and motor omnibuses are then discussed. Dealing first with railless electric traction, Professor Dobson comes to the conclusion that it must be regarded as an established and satisfactory system, requiring only an investigation as to the conditions under which such a system could be recommended justifiably, having regard to existing conditions, capital expenditure, population, and possible revenue. As to motor omnibuses, he points out that, owing to improvements, the motor omnibus is now considered by many managers of tramways to be an excellent method of feeding tramways, and will play a very important part in the future provision of public travelling facilities.

Financial Aspect.

Professor Dobson proceeds to discuss the financial aspect of the car on rail, railless electric and motor omnibus systems, and then says: The condition of the proposed extensions now before the committee is that the revenue to be obtained is generally an unknown quantity, and to deal with such problems I have come to the conclusion that a system should be adopted involving the lowest capital expenditure and a system which, if found financially a failure, can be so flexible that the vehicles can be tried on other routes and in other districts. This being the case, I have formed the conclusion that most of the future extensions in Johannesburg can best be dealt with in the first instance by motor omnibuses. If the proposition is such that a continuance of travelling facilities is justified, then the question of improving the service by the railless electric system or by the ordinary "car on rail" system can be considered at any time. The Council cannot in this way run any great financial risk, and at the same time it will have performed its duty to the public generally. By the adoption of motor omnibuses for the purpose of supplying communication for the outside suburbs, the revenue and expenses of such extension can be determined with absolute certainty, because the 'buses would ply between certain points only, and the fares collected can be kept distinctly separate from the revenue derived from fares on the electric cars, as also the maintenance in connection with these vehicles.

Scope of Omnibuses.

As examples of extension that are at present under the consideration of the committee we have: Newlands, 3·68 miles; Booysens Reserve, 0·80 miles; Observatory Extension, along Schmidt Street, 0·60 miles; La Rochelle, 1·00 miles; Melrose, 1·00 miles; and there are innumerable purposes for which motor omnibuses could be used advantageously, such as races, special functions at the Wanderers, dances extending after midnight, and other purposes too numerous to mention. After going into the question, I think that the Tramway and Lighting Committee should consider the advisability of purchasing six motor omnibuses in the first instance, four of which can be put to run regularly and two to be retained as spares and for other special purposes. The many ways in which these omnibuses can be used makes it clear that the Council would be investing money in a scheme which will result in providing the public with something that will be of the greatest service to them. In order that the committee shall have before it the opinion of others who have similar problems to investigate, Professor Dobson gives extracts from a discussion in a paper entitled "The Respective Values of Tramways, Motor-buses, and Railless Traction as Means of Transport," read by Mr. A. H. Pott at the Swansea Congress of the Tramways and Light Railways Association. This paper ultimately resulted in a heated discussion of the merits of extending tramways by means of motor omnibuses and railless electric systems.

RECOMMENDATIONS.

The following recommendations are made to the Council:—(1) That powers be obtained for running railless electric trams and motor omnibuses. (2) That such extensions as are proposed from time to time be dealt with in the first instance by means of motor omnibuses. (3) That six omnibuses be purchased at approximately £1,200 each, and that £8,000 be voted for the purpose. (4) That four omnibuses be put into use on extensions to be sanctioned by the Council, and two omnibuses be held in reserve as spares for breakdowns, and for use in cases of rush and special traffic. (5) That the question of housing these omnibuses be dealt with when the extension of the car sheds is under consideration.

Wilfley Tables.

All over the mining world where concentration of ores is proceeding, Wilfley tables are employed, and in South Africa they are rendering good service on the Waterberg Tin Fields. A few facts regarding the employment of Wilfleys in one of the principal base metal districts of America should here prove of interest:—In the mills of the Joplin district, Missouri, it is customary to use a drip spout on the Wilfley tables, on which the finest material is concentrated, to keep water flowing down the tail edge of the table. On the tables on which the coarser material is concentrated a cleat is nailed to the table near the edge of the tail end and under the wash-water box. The motion of the table causes the water to bank up at the cleat and flow down the tail edge, where ordinarily little water flows. Should the water tend to flow away from this edge, say at a distance of half the width of the table from the corner of the wash-water box, a second cleat is nailed to the table, which tends to deflect the water back to the edge. This cleat is nailed to the linoleum above the space occupied by the concentrates and far enough from that space so that the water will have spread out evenly below it before the band of concentrates is reached. In order to keep the line of separation between blende and middlings from coming to the corner of the table, where, in order to keep the concentrate clean, closer watching is necessary, it is the custom at many mills to use a finger. This is bolted to the deck of the table so that it can be rotated to cause the concentrates to discharge always at the front edge of the table. This is done because if the band of concentrates works past the corner the line of separation between concentrates and middlings moves back and forth in relation to the dividing partition of the catch box a distance equal to the stroke of the table. Some of these fingers are made of cast iron, others of wood with old rubber belting attached to the under side to rub upon the linoleum surface of the deck.

As the tables are used to make a three-mineral separation, it is customary to provide the concentrates box with catch spouts that are supported by rods held at the tail end of the table by 2in. pieces of wood. They are required because the line of concentrates frequently changes, and with every change it is necessary to adjust the spouts so that the same character of product will always be discharged into the same catch box. The frequent changing of the line of concentrates necessitates strong lighting of the tables at night. Therefore, a lighting trough is hung over the tail end of the table. In the trough are several 8-c.p. electric incandescent lamps, the sockets of which are supported upon a 2in. x 6in. timber, which also carries two pieces of galvanised iron nine inches wide to reflect the light downward. The lighting troughs are suspended from the mill rafters. In making a three-mineral separation it is necessary to make a sharp distinction between the bands of concentrates and middlings. If the concentrates come from the table in broad bands and the feed has not been closely classified, it is difficult to make a sharp separation between two products by using only the catch spouts. To facilitate making the separation it is the practice in certain Joplin mills to nail a notched lip or piece of galvanised iron to the tail end of the table. The depressions down the centre of each of the V's are made by bending the iron over a 20-d. nail. A portion of the bands of concentrates equal in width to the width of the upper end of the V is discharged from the lower end of each depression, the discharge coming off the table in several drips or streams that permit making a close differentiation between products.

South African Dividends.

The following South African dividends are payable this month and during September:—

Name of Company.	Amt.	Books Closed.	Payment
†Bantjes Consolidated	1/-	July 1—July 7	Aug. 6.
†Brakpan Mines	3/-	July 1—July 6	Aug 1.
*Central Mining & Investment	6/-	July 29—Aug. 2	Aug. 9.
†Clydesdale Trans. Collieries	5%§	July 1—July 6	Aug.
†Cons'd Co. Bultfontein Mine	7½%¶	July 1—July 7	Sept.
†Consolidated Main Reef	1/-	July 1—July 6	Aug.
†Crown Mines	5/6	July 1—July 7	Aug 6.
†De Beers (pref.)	10/-	July 1—July 7	Aug.
†Durban Roodepoort Deep	1/-	July 1—July 7	Aug. 6.
†East Rand Proprietary	2/6	July 1—July 6	Aug. 7.
†Elandslaagte Collieries	3¾%§	July 1—July 6	Aug.
†Geldenhuis Deep	2/-	July 1—July 7	Aug. 6.
†Ginsberg Gold	3/-	July 1—July 8	Aug. 22.
†Glynn's Lydenburg	3/-	Aug. 1—Aug. 7	Sept. 6.
†Griqualand West	4%¶	July 1—July 7	Sept.
†Johannesburg Consolidated	1/-	July 1—July 10	Sept.
†Johannesburg Estate	2½%§	July 15	Sept. 2.
†Knight's Deep	2/6	July 1—July 6	Aug. 14.
†Koffyfontein Estates	3/-	July 1—July 13	Aug.
†Kolmanskop Diamond	10%§	—	Aug. 30.
†Langlaagte Estate & Gold	1/-	June 30	Aug. 11.
†Main Reef West	1/6	July 1—July 6	Aug.
†May Consolidated	3/-	July 1—July 8	Aug.
†Meyer & Charlton	5/-	July 1—July 6	Aug. 16.
†Natal Navigation Collieries	-/9	July 1—July 6	Aug. 6.
†New Kleinfontein	1/6	July 1—July 2	Aug. 9.
†New Modderfontein	10/-	July 1—July 7	Aug. 6.
†New Primrose	5/-	July 1—July 8	Aug. 13.
†New Unified Main Reef	2/-	July 1—July 8	Aug. 22.
†Nourse Mines	1/-	Aug. 1—Aug. 7	Sept. 4.
†Premier (Trans.) Dia'd (def.)	7/6	June 29	Aug. 10.
†Rand Mines, Ltd.	5/6	July 1—July 7	Aug. 12.
†Robinson Gold	12/6	July 1—July 7	Aug. 6.
†Rose Deep	4/6	July 1—July 7	Aug. 6.
†Rooiberg Minerals	1/6	July 1—July 6	July 31.
†Simmer & Jack Proprietary	1/6	July 1—July 6	Aug 14.
*South African Gold Trust	1/-	July 29—Aug 3	Aug. 14.
†Transvaal Coal Trust	1/6	July 1—July 6	Aug. 1.
†Treasury Gold	10/-	July 1—July 6	Aug.
†Village Deep	1/6	July 1—July 7	Aug. 6.
†Witwatersrand Deep	2/6	July 1—July 6	Aug. 2.
†Witwatersrand Gold	3/6	July 1—July 8	Aug. 13.
†Zaaiplaats Tin	25%§	Aug. 1—Aug. 6	Sept. 2.

*Tax Free. †Less Income Tax at 1/2 in the £.

§Actual. ¶Per annum.

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Finance, Commerce, and Industries.

The Property Market. The following farms, situated in the Middelburg and Carolina districts, were sold by Messrs. Richard Currie this week:—"Luipaardsfontein," No. 524, in extent about 709 morgen 350 sq. roods. This farm is situated about ten miles south-east of the town of Middelburg, and was sold for £745 1s. 6d. "Grootdrakenstein," No. 501, in extent about 1,342 morgen 171 sq. roods. This farm is situated about midway between Middelburg and Ermelo, and the main road from Middelburg runs through it; it was sold for £2,416 2s. "Vaalwater" (Eikendaal), No. 227, portion, in extent about 1,223 morgen 472 sq. roods, and situated about twenty miles due west of Carolina; this realised £1,590 18s. "Witkrans," No. 220, portion, in extent about 1,036 morgen 592 sq. roods, and situated about ten miles south of Carolina; this sold for £1,037. "Strathrae," No. 558 (*alias* Uitval No. 62), portion, in extent about 2,668 morgen 81 sq. roods, and situated about eighteen miles north-west of Carolina, on the main road from Carolina to Wonderfontein, was sold for £3,735 7s. 9d. "Roopen" was sold for £1,700. "Mooivlei" realised £3,105.

* * * *

Natal Sugar Farms. A special interest attaches to the settlement in Natal, because of one or two problems peculiar to the Province. The sugar industry is approaching a point at which its production will more than suffice for the needs of South Africa, and export will be necessary. Naturally, the export price will regulate to a large extent the price which will continue to be obtainable in the local market. It has to be remembered, says the Port Elizabeth *Herald*, that the sugar-growers in the world's markets will have to compete with sugar which is assisted by a bounty in other countries. It is pointed out that future purchasers of sugar properties, though they may expect a profit which will cover the cost of production, are not likely to offer the high sums at which land has changed hands in the near past.

* * * *

Property Sales. Mr. L. C. Bellin, auctioneer, of Darnaway Buildings, Joubert Street, reports the following transactions put through at his auction sale on Friday last:—(1) By order of the trustees, Stand 1832, Malvern Reserve, with brick villa, for £775. (2) In the same estate, 100 shares in the Goldfields Building, Finance and Trust Corporation, for £9. (3) Stand 1936, vacant, Kennedy Street, Turffontein, for £13. (4) Stand 1937, vacant, Kennedy Street, Turffontein, for £12 10s.

* * * *

Irrigation Congress. The South African Irrigation Association announces its second annual congress to take place at Oudtshoorn, opening on Tuesday, 8th October. To those who had the opportunity of attending the first congress of the association, held at Bloemfontein last November, the announcement of the second congress will be received with gratification, for this association has already established itself as most business-like and practical in its methods. In addition to the great advantage which irrigators and all interested in irrigation farming in South Africa will have in being able to visit and inspect the largest and most important irrigation district in the country, this congress opens a comparatively new feature for meetings of this description. Some little time back the executive of the association announced that it had been decided to offer a prize of £15 for the best essay on the subject of "The Distribution of Water." In response to this the secretary states that no less than forty-three essays have been received, and among these are many of exceptional merit and interest. These essays are now in the hands of the judges, the Director of Irrigation (Mr. F. E. Kanthack), Mr. O. E. G. Evans, the well-known ostrich breeder and irrigator of the Bedford District (Cape Province), and Mr. J. H. Schoeman, M.L.A., one of the leading irrigators of Oudtshoorn and a pioneer. With such a jury, coupled with the distinct understanding that the practical value of each essay is to be considered before mere literary merit, the final results should be interesting in the extreme.

* * * *

Erection of a Zululand Sugar Mill. In connection with the alienation of Crown Lands in Zululand for the cultivation of sugar cane, the Government is prepared to receive proposals from persons or companies desirous of erecting and working a central sugar mill in the Ntambana Valley. The successful applicant will, subject to his providing proper milling facilities, be entitled to crush all sugar cane up to, but not exceeding, a limit of 15,000 tons per annum, to be grown on the land at Ntambana, including an area of land bounded northward by the watershed between the Rivers Enseleni and White Umfolozi, eastward by Reserve No. 5 and Lots 245, 244, 243, 242, 241, 240, 239 and 233, Empangeni, southward by the Umhlatuzi River, and westward by Reserve No. 11, in extent approximately 90,000 acres, portions of which land have been, or may hereafter be, subdivided into farms and allotted for the purpose of the cultivation of sugar cane, on the terms and conditions usually contained in Zululand sugar leases. The machinery to be erected must be capable of dealing with no less than 10,000 tons of sugar per annum, and the successful applicant will be required to provide the means for manufacturing up to a limit of 15,000 tons per annum, should the supply of cane grown on the Ntambana lands demand it. The extent of the mill site will be 150 acres, and the mill owners will also be entitled to a lease of two further lots aggregating 600 acres. The lease of the mill site and additional land will be subject to the usual conditions whereunder sugar leases are granted. The grant of a mill site, with the sole right of crushing cane on the above-mentioned area up to a limit of 15,000 tons per annum, will be governed by conditions similar to those imposed, in connection with grants of a like nature, but the actual details of the scheme are left to the proposers, who should forthwith supply full particulars thereof to the Government. The successful applicant will be required to deposit an amount of £2,000 with the Minister of Lands within three months from the signing of the agreement to be entered into with the Government, which sum will be forfeited to the Government if within twelve months from the date of the signing of such agreement no commencement has been made with the erection of the said mill, or in the event of the mill not being erected and in working order within two years and three months from the date of the signing of such agreement. Proposals will be received in writing by the Minister of Lands at Pretoria up to and including the 30th September, 1912, and all further information as to the situation of the land referred to in this notice and other details may be obtained on application to the undersigned or to the Secretary, Land Board, Pietermaritzburg. All such proposals should be submitted in a sealed envelope addressed to the Secretary for Lands, Pretoria, and be superscribed "Proposal for the erection of a sugar mill at Ntambana, Zululand."

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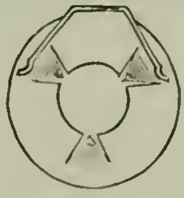

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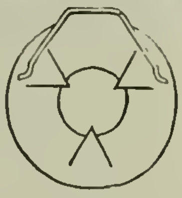

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Automobile Notes.

"Park" Trophy Trials.

The non-publication of the actual petrol consumption of the winning cars in the "Park" competition is affording subject for considerable comment, among the motoring community. The T.A.C. committee, however, are by no means averse to the results becoming known; as a matter of fact, copies of same have been handed to each competitor, and interested motorists can be furnished with all information they may require in regard to this competition by applying to the secretaries of the Club, at Dowell Buildings, Loveday Street. The first public notification of results, it is well to remark, will appear in the next issue of the official organ of the T.A.C., *The S.A. Motorist*.

T.A.C. Speed Competition.

It is decided to hold the club annual speed contest on Saturday the 7th September, the venue, subject to the approval of the Benoni Municipality, being the stretch of roadway between the 21st and 23rd mile-post on the East Rand Road. It is not expected that any opposition will be forthcoming from the Council referred to in this matter, and intending competitors may therefore accept this venue as decided upon. The difficulty, in the absence of a prepared track, of obtaining a suitable road for a competition of this nature, where the safety of competitors and spectators can be assured, is very real, and constitutes a recurring worry to the T.A.C. committee. A proper track, however, is not the least commendable object which the Club has in view, and judging from the success attending other schemes organised by that energetic body, it is quite probably that, with the advent of the next racing season the vexed problem of a track will be satisfactory solved.

The Licensing Question.

It seems strange that the Johannesburg Municipal bye-laws governing vehicles disallow the granting of licences to motor tri-cars and light four-wheelers, of 600lbs. weight and above, which are not fitted with a reverse gear and provided in addition with two independent brakes, etc. Many light cars in England and elsewhere, curiously enough, are only fitted with forward speeds, and were licences refused by the various corporations in regard to these machines manufacturers would naturally experience the greatest difficulty in marketing their productions. One can only conclude that a precedent is established by the Johannesburg Council in this particular direction, and, in view of the introduction of the light cars to these parts, several important agencies being, by the way, already under consideration, the restriction pointed out should be brought to the notice of the Automobile Club, as the best-informed association to decide such matters, at the earliest opportunity.

The Parsons' Non-Skid Chains.

There are few widely-travelled S.A. motorists who have not at one time or another experienced sticking with their cars in a drift, from which escape was alone possible by the aid of a team of oxen. The delay incidental to such adventure is very considerable, and at isolated points, where no assistance, even of the nature mentioned, is procurable, the progress of a car may be impeded indefinitely, by heavy sand for example, while the wearying process of scraping the obstruction away a few feet at a time until finally clear is being undertaken. By the use of Parsons' non-skid chains, however, this bugbear of the district motorist can be effectively avoided, and those whose business transactions entail much travelling in the wet season in particular are fast recognising these chains as an indispensable part of their outfit. It is interesting to remark, by way of illustrating the popularity of this equipment, that the American motoring public during last year purchased these chains to the extent of almost half-a-million, it being found that the greatest assistance has been rendered by their use in those parts where the heavy snowfalls present difficulties of an exceptional kind. S.A. motorists who travel without these valuable adjuncts, in circumstances which call for some such special provision, do so entirely at their own peril, and will be well advised to equip for emergency with the Parsons' non-skid device.

"Here and There."

The audacious manner in which a car, left a few evenings ago outside a Johannesburg Club, by a prominent citizen, was driven away by some individual, singularised by

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more effrontery than brains, as the sequel to the episode—a partially wrecked car—shows, once again illustrates the risks which attach to leaving cars unattended in the street at night. Whether the car in question was removed with criminal intent or with a view to "joy-riding" is not clear from the results of investigations by the authorities; motorists, nevertheless, should adopt protective measures under similar circumstances to those reported both in regard to the actual car, its removable mechanical fitments, and also cushions, etc., which offer inducement to the proclivities of the thief.

* * * *

The disposal of a stolen motor car in these parts would probably be a difficult matter, and little, in reality, is to be feared by owners on the score of deliberate theft, but the "joy-rider" and the jovial party constitute an element from which trouble of the nature referred to may at any time be expected. Where a public function is in progress, however, or where cars invariably congregate in large numbers, such as in the vicinity of a club, one would imagine that the simple provision of detailing an attendant to safeguard the interest of patrons should not escape the attention of the management concerned.

* * * *

At the time of writing nothing definite has been decided as to the venue and date on which the annual T.A.C. hill climbs will be held. The matter, it is expected, will be discussed at the next meeting of T.A.C. members.

* * * *

In view of the approaching hot season, motorists desirous of extending the life of tyres should take the precaution of starting with the tyres somewhat under inflated as the pressure naturally rises owing to the heat generated when the car is in motion some little time. Pressure testing should also be observed when much travelling is being done in the hot weather, and the air, when a safe limit is to any degree exceeded, be allowed to escape.

* * * *

In last issue a reference was made to the demolishing of some old buildings in the Johannesburg "petrol area," which may have lent a wrong impression, insomuch that one of the buildings, it was pointed out, so razed, was for many years occupied by the Johannesburg Vulcanising Works, and lest the idea was conveyed that this old firm of vulcanisers had quitted the field of operation, it is well to state that their business is now carried on in more commodious premises at the extreme southern end of Loveday Street.

* * * *

The recent announcement that American motor car manufacturers are to flood the British market with cars at £50 each is startling news, at least in regard to the figure. This invasion, however, has for long been anticipated by those engaged in the industry at Home and on the Continent.

* * * *

The increasing price of petrol in New Zealand has set up an agitation, in that enterprising part of the Empire, with the object of inducing the Government to undertake the manufacture of benzine, and build up an industry which would be largely independent of outside supplies. Benzine, it may be remarked, answers admirably a practical use in motor cars.

* * * *

The Riley Co., the manufacturers of the admirable light machine of that name, in a neat little booklet entitled "The Economical Way to Motor," primarily deals with the motor as an aid to golf. The arguments put forward are certainly conclusive in favour of the car, and in view of the patronage extended to the royal game in South Africa, its adherents will experience much pleasure, and possible help, from a perusal of the publication.

Johannesburg Vulcanizing Works.

In our issue of the 17th we mentioned that the old premises of the Johannesburg Vulcanizing Works were razed to the ground. The company is going back to the same premises in three months' time, and their temporary premises are still in Loveday Street, in premises occupied by Messrs. Stott Bros., and only a hundred yards nearer the mines than their old place, but on the opposite side of the road.

Establishment of Industries.

The Union Commerce and Industries Section of the Customs and Excise Department has recently been in communication with the local governing authorities of most of the larger towns of the Union, and has obtained a quantity of useful and interesting information respecting the facilities which these bodies are prepared to offer in connection with the establishment of industries within their jurisdiction. The information covers such matters as the quantity of land suitable for manufacturing sites and the terms on which the respective public bodies are prepared to deal with intending purchasers, the nature and cost of the water supply, also light and electric energy, the ruling rates of skilled and unskilled labour, and the amount and basis of local rating. The information has been primarily obtained for the use of the Trades Commissioner's Office in London, but anyone sufficiently interested in the matter can be supplied with information with regard to any specified centre or centres on application to the Commissioner of the Department, Pretoria.

* * * *

Delagoa Coal-Loading Installation.

According to Reuter, the engineers sent down to Delagoa Bay by the Union Government at the request of the Portuguese authorities to inspect the working model of the proposed coal-loading installation have concluded their labours, and will hand in their report in due course. By the decision of the Joint Board, this plant, or an efficient substitute, must be working within a year if Delagoa is to receive the export bounty on coal.

Union Export Figures.

The Union export figures for the six months ended June 30 show an increase, excluding specie, from £27,228,122 to £30,281,257, or about 12 per cent. The exports show an excess over imports of £11,500,000 for the six months, as against £8,600,000 for the same period of 1911. "In my opinion," said Mr. Jagger, in his speech at the Capetown Chamber of Commerce, last week, "the trade of the country at the present moment is in a very satisfactory condition, and on a very sound basis. There is no over trading going on so far as the greater part of South Africa is concerned." The main items of increase to which attention may be drawn were bark, from £138,335 to £157,955, but the increase in value would have been much greater had the price remained at the same level. Ostrich feathers increased by about £100,000, and maize rose from £73,931 to £139,951, but, of course, this is only a small increase in comparison with what would have been the case had the season been a favourable one, and what will be the case in the future when the land being put under cultivation bears good average crops. The export of oats increased from £7,298 to £17,351, and although the figures as yet are small, this is a crop which experts state will figure largely in the export returns in future years. The increase in the value of the gold output was about £2,000,000. Angora hair increased from £323,000 to £410,375, hides and skins from £537,878 to £694,824, whale oil from £3,718 to £46,906, and wool from £2,048,654 to £2,436,802. The coal export also increased from £533,079 to £604,523, and the diamond export from £3,806,131 to £4,135,581.

Extraordinary and Special Resolutions.

3323. Government Gold Mining Areas (Modderfontein) Consolidated, Limited, Johannesburg; amendment of Articles.

1773. Consolidated Langlaagte Mines, Limited, Johannesburg; amendment of Articles.

1722. Van Ryn Deep, Limited. Johannesburg; amendment of Articles.

766. New Unified Main Reef G.M. Co., Limited. Johannesburg; amendment of Articles.

722 Ginsberg Gold Mining Co., Ltd., Johannesburg; amendment of Articles.

674. New Rietfontein Estates Gold Mines, Limited, Johannesburg; amendment of Articles.

32. Witwatersrand Gold Mining Co., Limited, Johannesburg; amendment of Articles.

218. Glencairn Main Reef G.M. Co., Limited, Johannesburg; amendment of Articles.

3562. Paton and Morison, Limited, Johannesburg; adoption of liquidation account.

3408. Bubola Syndicate, Limited, Johannesburg; issue of reserve shares.

1111. Excelsior Buildings Co., Limited, Johannesburg; alterations of Articles.

3741. Concrete Construction Co., Limited, Pretoria; confirmation of agreement.

2729. Natal Oil and Fat Industries, Limited, Johannesburg; change of name.

Notices of Reduction and Increase of Capital.

2789. Transvaal Bischoff. Limited, Johannesburg; increased from £30,000 to £32,054 10s.

3747. Engineering Supplies, Limited, Johannesburg; increased from £30,000 to £32,000.

3951. El Oro (Transvaal) Gold, Limited, Johannesburg; increased from £17,000 to £18,250.

Liquidations.

3760. World's Tours (S.A.), Limited, Johannesburg: voluntary.

3765. British Bechuanaland Diamonds, Limited, Johannesburg; voluntary.

Notices of the Situation of Registered Office.

2589. Karee Diamond Prospecting Syndicate, Limited, 133-4, Stock Exchange Buildings, Johannesburg.

1819. Mineral Farms Syndicate, Limited, 20. Charlton Chambers, Harrison Street, Johannesburg.

3100. Appingendam Tin Mines, Limited, 12, Charlton Chambers, Harrison Street, Johannesburg.

3251. The Rooiberg Extension Tin Mines, Limited, 12. Charlton Chambers, Harrison Street. Johannesburg.

4000. Lamb, Raphaely and Co., Limited, 19a, Simmonds Street, Johannesburg.

3328. Henley-on-Klip Township, Limited, 12, Trust Buildings, corner Fox and Loveday Streets, Johannesburg.

3860. Africa's Amalgamated Theatres, Limited, 46-49, Winchester House, Corner Loveday and Main Streets, Johannesburg.

251. Randfontein Estates G.M. Co., Witwatersrand, Limited, Robinson Station, Claims 2311, 2312, 2313, and 2227, Farm Randfontein No. 3, in the Mining District of Krugersdorp.

905. The Orange Free State and Transvaal Diamond Mines, Limited, Robinson Station. Claims 2311, 2312, 2313 and 2227, Farm Randfontein No. 3, in the Mining District of Krugersdorp.

2749. Randfontein Central Gold Mining Company, Limited, Robinson Station, Claims 2311, 2312, 2313 and 2227, Farm Randfontein No. 3, in the Mining District of Krugersdorp.

109. Langlaagte Estate and Gold Mining Company, Limited, Robinson Station, Claims 2311, 2312, 2313 and 2227, Farm Randfontein No. 3, in the Mining District of Krugersdorp.

3959. Bellevue Tins, Limited, 17, Transvaal Bank Buildings, Fox Street, Johannesburg.

2510. Carter Diamond Prospecting Syndicate, Limited, room 12, 2nd Floor, Transvaal Bank Buildings, Fox Street, Johannesburg.

2412. Boksburg Properties, Ltd., Bezuidenhout's Buildings, Boksburg.

3077. Banket Reefs, Limited, 4, 7, and 8 Trust Buildings, Johannesburg.

3583. The Rand Motor Cab Co., Limited, 137, Commissioner Street, Johannesburg.

1869. The Pietersburg Hotels, Limited, 6, Lawley's Buildings, Fox Street, Johannesburg.

1665. Imperial Buildings Syndicate, Limited, Nos. 99-100, Exploration Buildings, Commissioner Street, Johannesburg.

1953. Livingstone Buildings, Limited, Nos. 99-100, Exploration Buildings, Commissioner Street, Johannesburg.

3408. Bubola Syndicate, Limited, Nos. 99-100, Exploration Buildings, Commissioner Street, Johannesburg.

3819. Albion Zaaiplaats North Tin Mines, Limited, Nos. 99-100, Exploration Buildings, Commissioner Street, Johannesburg.

1969. De Pretoria Oost-Eind School Vereeniging Beperkt, 160, St. Andries Street, Pretoria.

3890. Phoenician (Rhodesia) Co., Limited, 17-18, Royal Chambers, corner Fox and Simmonds Streets, Johannesburg.

4036. Norman and Lyche, Limited, 173, Skinner Street, Pretoria.

Companies Registered.

The following is a list of companies registered in July, 1912 :--

4028. Central Diamond Snydicate, Limited, 125. Cullinan Buildings, Johannesburg.

4029. The Transvaal Cavalry Association, the Grand Hotel, Market Street, Pretoria.

4030. The Transvaal Tanning Co., Limited, 261, Vermeulen Street, Pretoria.

4032. Leviathan Tin Development. Limited. 107, Exploration Buildings, Commissioner Street, Johannesburg.

4033. Moores, Limited, 5, Manner's Mansions, Joubert Street, Johannesburg.

4034. R. S. Stokvis and Sons (South Africa), Limited. 296, Market Street, Pretoria.

4035. Rand Torch Factory, Limited, 2a, De Beer Street. Braamfontein.

4036. Norman and Lyche, Limited, 12, Sidney Buildings, St. Andries Street, Pretoria.

4037. Union Soap Works Company, Limited. Erf No. 1937, Carl Street. Pretoria West, Pretoria.

4038. Blaaubank Gold Mine, Limited, the Farm, Flaauwbank No. 104, Krugersdorp.

4039. Georgian Gold Co., Limited, 13, Winchester House, Loveday Street, Johannesburg.

Foreign Companies Registered.

4031. Granaatplaats Diamond Prospecting Syndicate, Limited, care of Thomas Edward Duckles, 618-20, Consolidated Buildings, Fox Street, Johannesburg.

Prospectuses.

3079. Solomon's Temple Tin Mines, Limited, Johannesburg.
Pfleumatic (S.A.,) Limited.

Additions and Alterations.

576. New Primrose Gold Mining Co., Limited, Johannesburg.

Change of Name.

2729. Natal Oil and Fat Industries, Limited, to South African Oil and Fat Industries, Limited.

Cape Copper Mining.

The Capetown correspondent of the *Eastern Province Herald* writes:—" At the Chamber of Commerce meeting held on Monday, Mr. J. W. Jagger, M.L.A., commented on the exceedingly satisfactory condition of the trade of this country as revealed by the latest statistics. These showed big increases generally, and roused him to enthusiasm. But in regard to one item there was a big decrease—copper. He commented on this, and said he did not know whether it meant that the Namaqualand copper mines were petering out. Whether that is the explanation or not, it is significant that the last report of the Labour Bureau, issued yesterday, mentions that several men who had been retrenched from the copper mines had called at the bureau in search of work."

London Capital in the Bushveld.

It is reported that a group of persons in London, with considerable financial support, are interesting themselves in the prospects in the eastern part of the Pretoria district.

INVESTORS' DIARY.

The following company meetings have been announced:—

Aug. 30.—Treasury Gold Mines; Wit. Deep; Crown Mines.
Sept. 4.—New Kleinfontein; Anglo-French Land Co.
Sept. 21.—Wit. Deep.
Sept. 23.—Crown Mines.
Sept. 27.—Sub-Nigel; Simmer and Jack Prop.; New Kleinfontein; Wolhuter, G.M.
Oct. 19.—Wolhuter G.M.
Oct. 29.—Jumpers G.M. Co.
Oct. 30.—Rooiberg Minerals.
Nov. 6.—New Modderfontein.
Nov. 27.—New Boksburg G.M.; Rand Klip.

RICHARD CURRIE'S SALES.

The Simmer & Jack East, Limited

(IN LIQUIDATION).

FOR SALE IN ONE LOT.

WITHOUT RESERVE. WITHOUT RESERVE.

The Well-Known Simmer and Jack East Mine.

Consisting of the Following Claims and Mynpachts, with Buildings, Machinery, Plant, etc.

65 PROSPECTING CLAIMS	**Situated on the Farms "Driefontein," No. 12 & "Elandsfontein," No. 11**
166 DIGGERS CLAIMS	

Two Mynpachts on the farm "Driefontein," No. 12 and in Area 57 Morgen, 117 Square Roods.

Portion of Mynpacht, No. 302/95 on the Farm "Elandsfontein, No. 11, and in Extent 10 Morgen, 268 Square Roods, 56 Square Feet.

THE undersigned, duly favoured with instructions from the Liquidators of the SIMMER & JACK EAST, LTD. (In Liquidation), will Sell,

On Thursday, 26th of September, 1912,

AT 11 A.M.

At the Old Mart, 112, Commissioner-st., Johannesburg.

All the Assets in the Transvaal (except cash) of the above Company, consisting of the Claims and Mynpachts, as mentioned above, together with all buildings, machinery, plant, stores, etc. and Shares, as follows:—

BUILDINGS.

Offices, Officials' Houses, Married Quarters, Single Men's Quarters, Boarding House, two large Compounds for Natives, equipped with Hospital and every convenience. Stores, Magazines, Machine Shops, Compressor House, Engine Rooms, Boiler House, Changing and Drying Rooms, etc., etc.

MACHINERY AND PLANT

4 Hauling Engines, 3 Underground Hauling Engines, 16 Boilers and 5 Boilers not in use, 3 Compressors, Rock Drill Plant, 2 Head Gears with Ore Bins and Chutes, Electric Light and Power Plant, Winches, Hoists, Pumps, Skips Trucks, Rails, etc., Mechanical Railway and Engines.

STORES.

A large quantity of Stores of every kind necessary for a Fully-equipped Mine; also a number of Spare Parts for Machinery, Tools, etc.

BATTERY AND REDUCTION PLANT.

The SIMMER & JACK EAST'S Share in the Joint Ore Reduction Plant on the Knight's Deep property. This Plant consists of:—400 Stamp Battery and Milling Plant, Power Plant, Boiler Plant, Tube Milling Plant, Return Water Service, Sands Plant, Slime Plant, Precipitation Plant, Refinery Plant, Water Cooling and Circulating Service, Combined Pumping Plant, Water Cooling Arrangements, Electric Power Plant.

SHARES.

200 Shares in the Rose Deep, Limited.

727 Shares in the Witwatersrand Native Labour Association.

Share or Interest in the Consolidated Gold Fields Native Labour Organization.

The SIMMER & JACK EAST Gold Mine is only a few minutes' walk from Germiston Railway Station, and is one of the most important Mining Properties ever submitted to Public Auction in Johannesburg.

The Sale will be WITHOUT RESERVE in One Lot to the Highest Bidder.

TERMS.

Cash; or the Buyer will have the option to pay in two instalments—one-third on day of sale, and two-thirds on the 27th January, 1913, for which Promissory Notes may be required by the Sellers.

Possession to be taken on the 1st OCTOBER, 1912, until which date the property will be worked for the benefit of the Sellers.

Transfer to be passed on payment in full of purchase price,

RICHARD CURRIE,
Auctioneer, Appraiser & Estate Agent

41242

OVER

2,000

Plants in use.

The only

Absolutely

AUTOMATIC PLANT

IN

EXISTENCE.

Fitted in

MINES,
MILLS,
ELECTRIC STATIONS.
ETC.

FOR

WATER SOFTENERS
AND
OIL ELIMINATORS

Apply to

The Harris Patent Feed Water Filters
(1910), Ltd.,
NEWCASTLE-ON-TYNE, ENGLAND.

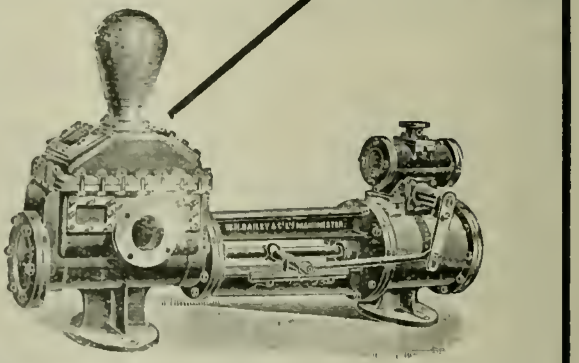

Fig. 1D.—"Davidson" Boiler Feed Pump.
For any Pressure with Pistons or Rams.

BAILEY'S "DAVIDSON" PATENT

STEAM PUMP

OF HIGHEST ECONOMY.
HOLDS THE RECORD FOR DURABILITY.

Uses 50 per cent. less Steam than Ordinary Pumps. Absolutely Positive in Action. Horizontal or Vertical.

The Pump with the simplest Slide Valve!

For Air Lift Pumping Plants, Deep Well Pumps, Steam Traps, Valves, Recorders, Turnstiles, etc., see Special Lists

MANUFACTURERS

W. H. Bailey & Co., Ltd.,

ALBION WORKS.

Manchester, England.

WHB

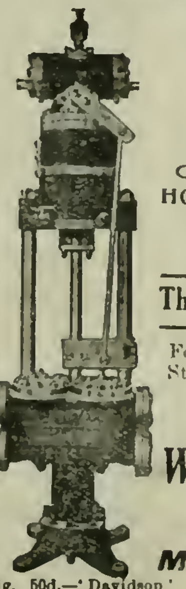

Fig. 50d.—'Davidson' Economical Boiler Feed Pump.

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Notes and News.

Diamond Returns. The diamond production for the Union in the half-year ended June 30 last is given elsewhere in this issue. It is noteworthy that the total value of diamonds found at the river diggings of the Union of South Africa for the half-year was £410,590, the average number of Europeans employed being 4,800 and natives 14,058. Taking the wages of the latter at £2 per month, this leaves about £8 per month per licensed digger—not a very encouraging result.

* * * *

Robinson Deep. The crushing operations of this mine have been retarded somewhat during the month owing to an accident to the rock hoist at No. 2 shaft. We understand that the shaft carrying the drums of the hoist in question broke. The necessary repairs occupied a week, during which time it was not possible to hoist any rock through the No. 2 shaft. The loss of tonnage thus caused will affect the August profits to a considerable extent.

* * * *

Jupiter G.M. Co. During the month some trouble was caused at this mine by an accident to the brake apparatus of the Catlin shaft conical rock hoist. In addition to this the stator of the Howard shaft underground electrical winder burnt out. The necessary repairs to both hoists having been effected, everything is now running smoothly at the mine. In consequence of these accidents there will be a falling-off in tonnage for August, which will reflect on the profits for that month.

* * * *

Knights Deep Fire. The new crusher station of this company was put into commission on 16th August, and the whole 400 stamps of the Knights Deep—Simmer East joint plant are now in full operation. Much credit is due to the officials in charge for the expeditious manner in which they did the necessary work to enable crushing operations to be resumed with such little delay.

* * * *

An American Mining Inquiry. A despatch from Washington states that the creation of a commission on mining industry to make an exhaustive study of mining conditions in the United States was proposed in a bill introduced in the House by Representative Foster, of Illinois, Chairman of the Committee on Mines and Mining. The commission was to consist of eleven members, two senators, two Representatives, two mine operators, two representatives of the miners, two mining engineers, and one representative of the Bureau of Mines. The commission would be required to report within two years, and to make a report on general conditions of labour, safety, conservation of resources, the relation between employers and employees, and seek to "discover the underlying causes of dissatisfaction in the mining situation."

* * * *

Kaapsche Hoop. Mr. Thomas Wightman writes to a London contemporary regarding the Peacock nugget, as follows: "The following note may be of interest *re* 179-oz. nugget found at Kaapsche Hoop. Having spent several years in the vicinity of alluvial mining, and being secretary for the local Diggers' Committee after the war, can vouch for correctness of information. Mr. Peacock, who is an old friend of mine, was acting-manager of Coetzeestroom Gold Mining Company when I left about three years ago. Kaapsche Hoop, or Duivels Kantoor, where Mr. Peacock has recently unearthed a 179-oz. nugget, was over twenty years ago a prosperous digging. It is a detached portion of the Drakensberg plateau, standing some 6,000 ft. above sea-level, and thirty miles north-west of

Barberton. There have been some heavy nuggets found here at different times. During the war a Hottentot servant of the Field Cornet picked up one while looking for mules which, I believe, went close on 70 ozs., and I have myself found up to 5-oz. pieces in old workings after rain. For many years past the fields have been practically abandoned, as the payable claims which could be sluiced have been worked out long ago, as also the richer of the gold runs and gutters, which were carted to water. Many of the heavier nuggets have been found on or near the surface where denuded. Peacock was one of the early successful Kantoor diggers, and returned there (after several years' absence) at the close of the Boer War. It would be regrettable should Peacock's lucky find cause any sort of rush to this field, which for years past has been unable to support and has starved out, the hardest working old experienced diggers. It is an axiom there, "where you find a big nugget you won't find any more."

* * * *

Piggs Peak Profits.

The accounts of Piggs Peak for the year ending March 31, 1912, have just been issued. Mr. Hunter, the new manager, took over the charge of the company's property on March 28 last. During the period under review, 31,913 tons of ore were mined and sent to the mill of an average value of 8·153 dwts., or 34s. 6·5d. per ton; of this 1,660 tons were taken from the new section mine, an additional five stamps having been added to the mill for the express purpose of dealing with this new section ore. The ore being of a refractory nature, but containing high values, has been concentrated after crushing, and the concentrates sent home to be sold in England. The total amount realised by the year's operations was £54,289, giving a net profit of £21,728. This, with a sum of £979, brought forward from last year, makes a total to credit of profit and loss of £22,707. The directors propose to write off the sum of £21,899 19s. 1d. from mine development account, which will then stand at £78,000, and the balance of £807 17s. 2d. will be carried forward to next year. During the year development has been carried on both in the old section and the new section mines. In the rise from the 5th to the 4th level of the new section mine some exceptionally rich ore was encountered. Mr. Hunter, having so recently taken over the management, did not feel justified in giving actual figures for ore reserves until he had made himself thoroughly acquainted with the mine, and had checked the values for himself. He states, however, that as far as he had gone he considered the estimates submitted last year by his predecessor to be well within the mark. The negotiations for the acquisition of Ruby Creek mining concession have been successfully completed, and the titles are now being transferred into the company's name. Mr. Hunter has already commenced prospecting the concession and has located a quartz reef which, though containing low values in the outcrop, gives promise of improvement in depth. Development will commence here as soon as sufficient labour is available. A considerable amount of additional ore averaging from 6 to 7 dwts. has been developed at Eagle's Nest. Work has been suspended temporarily pending the result of certain experiments now being carried on for the treatment of the ore which presents some difficulty. Such a report as this will give greater encouragement to the shareholders.

* * * *

Important Statistics.

The official mining statistics for July, printed elsewhere in this issue, include the half-yearly figures of the diamond industry. The total production of the Union was 2,392,255 carats, value £4,541,451, a decrease on the previous half-year of 651,192 carats, and in value £6,358. The Transvaal production was 982,153 carats, value £1,037,144, whereof 41,101 carats, value £190,062, were recovered from the River Diggings. The Cape produced 1,079,422 carats, value £2,754,892, the Kimberley output being 1,040,890¾ carats, value £2,557,422; other contributing districts being Barkly West, Herbert, Kuruman, and Vryburg. The Free State produced 330,679 carats, value £749,415. The Fauresmith district, in which Jagersfontein lies, returned 206,377 carats, value £625,722; Kroonstad district 68,449 carats, value £64,515; and Boshof 54,883 carats, value £58,253. Altogether eighteen mines contributed. The coal output for July for the Union amounted to 704,488 tons, value £176,187, an increase on June of 66,506 tons, value £18,133. The Transvaal produced 408,656 tons, Natal 241,018 tons, Free State 12,743 tons, and the Cape 4,086 tons. The Transvaal sold 116 tons of copper, value £3,861, and the Cape 4,319 tons, value £132,215. The Transvaal sold 239 tons of tin, value £29,584. The Cape produced 106 tons of asbestos, value £1,575, while within the Union 5,907 tons of lime, value £9,276, were produced. During July 31,656 whites and 277,939 coloureds were employed in mining, an increase of 31 whites on the previous month, and a decrease of 5,126 in coloureds. The net issued capital of Transvaal gold mines on December 31, 1911, amounted to £73,347,702, of Transvaal diamond mines £237,538, of coal mines £3,800,735, and of base minerals £1,471,925. The figures for the Cape net issued capital are:—Gold £157,601, diamonds £5,732,288, coal £253,097, base minerals £1,472,289. Free State: Gold £290,035, diamonds £2,649,619, coal £1,102,680. Natal: Gold £59,832, coal £2,576,939, base minerals £44,078.

* * * *

Village Main Reef Returns.

Labour conditions at the Village Main Reef showed considerable improvement during the three months ended with June last, and as a result 143,752 tons were mined, as compared with 115,950 in the preceding quarter. Development footage is now steadily decreasing, owing to the few faces left, only 643 feet being accomplished during the quarter. The reef disclosures were:—Main Reef Leader 272 feet, width 12 inches, assay value 45s. 1d.; South Reef 224 feet, width 8 inches, assay value 81s. 5d.; estimated payable tonnage of ore exposed by drives, etc., 3,043 tons. Figures as to reduction operations are:—Ore received from mine, 143,752 tons; waste sorted out, 17·5 per cent.; tonnage crushed, 117,946 tons; number of stamps operating, 220; number of tube mills operating, 5. Value of ore before crushing (reflected by mill yield and value of pulp):—Mill yield per ton, 24s. 9d.; assay value of pulp, 14s. 8d.; total, 39s. 5d. (the values per ton are calculated at 84s. per fine oz.).; total yield, 53,435 ozs. fine; total yield per ton, 38s. 1d.; accumulations, 7,680 tons treated, yielding 908 ozs. fine. The total revenue for the quarter was £223,946, being at the rate of 38s. per ton. Working expenses absorbed £109,990, or 18s. 8d. per ton, leaving a working profit of £113,956, or 19s. 4d. per ton.

* * * *

The Ferreira Deep's Quarter.

The Ferreira Deep earned a greatly increased profit during the quarter ended with June last, mainly as a result of a considerable reduction in working expenses, improved conditions underground at the deep section, an increase in the tonnage crushed, and also the inclusion for the month of June of the returns of the Ferreira G.M. Co., now in liquidation. The sinking of No. 1 shaft (Ferreira section) was completed, and connection made with the second level of the Ferreira Deep, Ltd. It was expected to send rock from the upper levels of the deep section to the Ferreira mill at the end of August. The development footage shows an improvement of 481 feet for the quarter. The values of reef exposures, which may be considered very satisfactory, are as follows:—Number of feet driven, sunk and risen, exclusive of stopes, 3,633 feet. The reef disclosures were as follows:—Main Reef 48 feet, width 37 inches, assay value 10s. 1d.; Main Reef Leader 1,312 feet, width 35 inches, assay value 54s. 8d.; South Reef 1,305 feet, width 20 inches, assay value 113s. During the six months ended 30th June, 1912, 84,794 tons were developed of a value of 39s. 1d. per ton, in addition to which a considerable tonnage has been exposed by driving, and will be included in the ore reserves when fully developed and valued. Capital account shows a credit of £78, and £11,683 are required for the completion of authorised work, which includes the cost of providing brakes for the hauling engines on their electrification. The original scheme of sands-filling has been completed, but work on a smaller scale is still going on. The working profit for the quarter is returned at £130,380 (21s. 10d. per ton), which constitutes an advance of £38,827 on the earning for the preceding three months. Working expenses were at the rate of 21s. 5d. per ton. The total yield was £258,466, or 43s. 3d. per ton. The reduction works figures are as follows:—Ore received from mine, 142,496 tons; waste sorted out, 17·4 per cent.; tonnage crushed, 119,430 tons; number of stamps operating, 185; number of tube mills operating, 5·3. Value of ore before crushing (reflected by mill yield and value of pulp):—Mill yield per ton, 30s. 2d.; assay value of pulp, 14s. 7d.; total, 44s. 9d. (the value per ton is calculated at 84s. per fine oz.). Total yield, 61,552 fine ozs.; total yield per ton, 43s. 4d.; accumulated slimes, tonnage treated, 2,370 tons; accumulated slimes yield, 454 fine ozs.

* * * *

Ambulance Challenge Shield for Underground Mine Workers.

With a view to improving existing conditions in ambulance work below ground, the Chemical, Metallurgical and Mining Society of South Africa is offering a handsome challenge shield for competition amongst mine workers underground. The competition will be confined to mining teams of five men from any mine in the Union and Rhodesia. The members of teams must be holders of certificates from a recognised ambulance association, and the competition will be held as far as possible underground under actual and practical mining conditions. It is proposed to hold the competition annually, the first to be held some time in October next. Rules and conditions for the competition have been prepared by a joint committee of members of the Council of the Society and the St. John Ambulance Association, and will be ready for issue in the course of a day or two. Entries will close on the 28th September next. If necessitated by a large number of entries, elimination trials will be held at several centres. Owing to the varying number of men engaged on different mines, it is proposed to accept one team from every hundred, or fraction of a hundred, from each mine. The latest text book of the St. John Ambulance Association will be the basis for judging the first aid work. As the mining regulations state that most mining officials have to be in possession of a certificate of a recognised Ambulance Association by the 1st January next, it is felt that a well-needed impetus to the work is thus being given, and the Society hopes there will be a strenuous struggle for the honour of becoming the first holders of the Shield. The members of the winning team will receive silver medals, and if the judges consider the second team worthy of recognition, the members of that team will receive bronze medals. Messrs. Fred. Rowland (secretary of the society, P.O. Box 1183, and 'Phone 1404, Johannesburg) and C. F. W. Burbury (secretary of the St. John Ambulance Association) are joint secretaries for the competition, and will be pleased to send particulars of the competition to those interested. It is believed that another shield will be available for competition at an early date for mine surface workers.

* * * *

Willoughby's Consolidated.

At the meeting of shareholders held in mail week the chairman submitted a businesslike statement. The year under review was the best in the company's history, and the prospects are brighter than they have been represented to be hitherto. The net profit for the year was £56,980, which, with the amount brought into the accounts, gave an available total of £148,236. A feeling of disappointment at the non-declaration of a dividend is doubtless experienced; but, as Sir John Willoughby pointed out, the company just now is in a transition or construction stage, and the directors consider it obligatory upon them to retain sufficient funds in hand and so render themselves independent of the fluctuations of the sharemarket. The account of things in Rhodesia generally was good and calculated to inspire confidence.

TOPICS OF THE WEEK.

THE DEARTH OF CAPITAL.

In a striking message to the London financial papers, some time ago, General Botha declared that the most pressing need of South Africa to-day was more capital, and evidence of the fact grows daily more overwhelming. The latest proof, were any needed, is furnished by some interesting banking figures printed in our last issue, to which we would again direct attention. The most noticeable fact in the tables reflecting the figures for the last six years was that fixed deposits have more than maintained their level, while the other figures—especially discounts and advances—fell rapidly. This was, no doubt, due to the banks' restrictive policy, which placed a check on overtrading and speculation; as well as to the comparatively high rate of interest, which drew more money into the banks than the latter could suitably dispose of. When deposit rates were, later, reduced, fixed deposit figures started on the downward grade just as other figures showed a tendency to improve. The key to the situation is that the banks must provide for a reasonable margin between the total deposits and advances. If there is a sufficiency of floating deposits, no manipulation of rates is necessary to attract fixed deposits; and if a keen demand for accommodation coincides with a dearth of floating deposits, rates must be raised sufficiently to attract fixed deposits. The tables showed that the task of regulating the margin between these two sets of figures was a difficult one, for much of the capital lying idle in the country between 1906 and 1909 flowed into the hands of bankers, who could not dispose of it suitably in South Africa. Deposits exceeded advances by £5,967,082 in 1906, and by £8,897,985 in 1909; and owing to the lack of means of investment locally, large portions of these surplus funds were transferred by bankers for investment on the London money market. The figures subsequent to 1909 revealed the fact that advances and discounts increased in a much greater ratio than deposits; that while the latter were slightly less than the figures for 1906, advances and discounts increased by about two and a half millions. Deposits exceed advances now by only £3,364,999—very little more than half the sum representing the margin in 1906. The margin is dangerously low now, which fact seems to suggest that bankers have done their best during the last year or two to supply the increasing demand for accommodation, relying on an increase in deposits to support them in this purpose. Floating deposits do not show any tendency to swell, owing to the great demand for ready money in various branches of trade. The only alternative is, therefore, to tempt fixed deposits by means of high rates, but even this method has only proved partially successful, for the total is less now than it was in 1906. These facts point pretty clearly to the dearth of capital in this country at the present time. Several references were made to this fact in Parliament during the closing weeks of the recent session; and one or two members urged the Government to refrain from its purpose of raising a loan locally, as such a method would prove harmful by diverting capital from channels where it is doing useful service now. It is clear that if the demand for accommodation continues to increase, banks will be unable to dole out supplies in the same liberal manner as formerly, unless deposits increase substantially. We may, therefore, be faced with another period of restriction.

Apropos of this, we may recall the significant remarks made in the course of his speech at the extraordinary general meeting of shareholders of the National Bank of

South Africa, Ltd., by the chairman (the Hon. Hugh Crawford), who said, *inter alia*:—"In one of our leading newspapers an article appeared last week under the heading of 'Raising Capital in South Africa,' which, if given effect to by the Government in every respect, might be fraught with results contrary to what the writer imagined. Briefly, he advocated the raising of loans in South Africa, and increasing the rate of interest allowed by the Post Office Savings Bank, and removing the restrictions to much larger sums being deposited. Now, it is well known that the Government can borrow in the London market at lower rates than either banks, municipalities or private companies, and every loan so raised brings additional capital into the country. Were the Government to cease doing this, and to compete for deposits through the Post Office Savings Bank by increasing the rates of interest paid and removing or largely increasing the limit on amounts that could be deposited, the deposits with banks might be seriously reduced, and consequently the commercial community, mining companies, farmers and the public generally who are now supplied by the banks with funds, might have their facilities curtailed. As long as the banks can allow the rates of interest they are and have been paying, the Government should not be invited or urged to encroach upon business that legitimately belongs to banks and other trading concerns, more especially as such action is not to the benefit of the community as a whole. The Savings Banks serve a useful purpose, and no one desires to interfere with their proper functions or the excellent service they render to the frugal and industrious of small means, but our banks are also useful institutions in collecting from those who have money to spare, and distributing to those who require money for legitimate purposes, and their domain should likewise not be interfered with except for good and sound reasons. The banks in South Africa are probably supplying about forty millions in this way, and their capital and reserves afford a good guarantee to depositors against possible losses." In view of this, it is hoped that the last has now been heard of the fatuous policy of raising Government loans locally. But this represents, after all, merely a negative form of State encouragement to the introduction of fresh capital. Something more positive is required, and in this connection the Government might seriously consider the Canadian example of compelling all foreign insurance companies doing business in the country to invest a proportion of their annual premium receipts—say 80 per cent.—within the Union. There is much to be said in favour of the proposal, and little against it. A sufficiency of gilt-edged investments, first mortgages and the like, would always be available, and the presence of these large sums would set free for the financing of ordinary trade operations much money now locked up in these securities. We have no statistics to guide us in regard to the extent of these funds, but there is every reason to believe that they are considerable. The existing Insurance Act merely requires the deposit of securities to the value of £10,000 with the Government by every insurance company doing business here. It would be easy to extend the principle as suggested, and it is to be hoped that the Government will seriously consider this simple and effective expedient for increasing the available supply of capital in the country.

THE OUTLOOK IN RHODESIA.

After two years of depression there appear to be signs of returning prosperity in Rhodesia. "Chartereds," the barometer of the situation in this section of the Kaffir market, are quoted at 29s. 9d. buyers, and there is a rumour abroad that they will go higher. Certainly the outlook for mining in Matabeleland and Mashonaland is brighter to-day than it has been for months past. The mineral production of the country for July was of the substantial value of £276,606. The gold produced was worth £240,514, the third largest monthly return on record, and the amount of chrome iron ore exported, 11,986 tons, worth £26,754, directs a fresh measure of attention to the possibilities of the deposits at Selukwe and elsewhere. Several of the larger mines which have for the past two years been developing are being equipped with reduction and treatment plants, and the country will soon be reaping the benefit of money and the patient work that have been expended on the blocking out of ore at the Shamva, the Cam and Motor, the Falcon, the Athens, and other properties. The productive mines appear on the whole to be well maintaining outputs and profits. Some unsatisfactory features there may be in connection with the more recent developments at the Globe and Phoenix and the Eldorado, but these are counterbalanced by the excellent returns of the Lonely and the much-improved affairs at the Rezende. The lesser mines—those owned by local syndicates—and the scores of ventures operated on a tributing or leasehold basis, continue to supplement the production of the limited liability concerns as of yore. There are no indications that the gold yield from these sources is likely to decline, as was anticipated a few years ago when the "small mine movement" began to make its influence felt on the industry and revenue of the country. As a fact it seems that the output from the lesser mines is likely to increase, for the tributors and lessees are not merely exhausting the development achieved in past years by the parental corporations: they are, where agreements render such a course profitable, developing on their own account. For the time even the outlook in regard to labour—that constant bugbear of the industry—is most favourable. That the bureau should have to report a surplus of boys is a remarkable pleasing state of affairs which will be appreciated by farmers as well as mine owners. The influence of the drought has not had anything like the serious effects that were at one time anticipated. In South-West Matabeleland there is an acute shortage of water, so much so that the Antelope property is to be equipped with a dry crushing plant. But this state of affairs is by no means general throughout the country. Rhodesia is fortunate in possessing many prospectors of the right class, and at this time of the year a very large amount of exploratory work is proceeding. Several discoveries have been reported since the conclusion of the rainy season, and whilst it is at present impossible to gauge their value it is probable that one or two of them at least will prove of importance. Apart from gold and chrome iron there are several encouraging features to be noted in the mining industry. What appears to be an extensive cassiterite field is being opened up in the Enterprise district and influential capitalists have acquired large interests there. The Umkondo and Edmundian copper mines are being re-opened, and at the Wankie Colliery there is much activity in connection with the plant that is to supply Katanga with coke. Three years ago, when Rhodesia suddenly came into public favour again, much unwarranted optimism was scattered broadcast. Unfulfilled and unsound expectations soon reacted on the country. Rhodesia does not desire another "boom." What the country needs is a calm and measured return of interest in the mines and farms of the two provinces. It certainly seems that Rhodesia is emerging from the doldrums and that the country to-day is in a more sound and stable condition than ever before.

BRAKPAN MINES.

Steady Progress in Profits—An Admirable Record—Gratifying Development Returns.

The figures relating to the latest monthly returns of the Brakpan Mines mark another advance in a career of consistent progress of which the company may well be proud. The record for the seven months of the present year is, briefly, as follows:—

	Tons Milled.	Revenne per ton Milled.	Expenses per ton Milled.	Total Profit.	Profit per ton Milled.
January	41,060	28/ 6	18/ 1	£21,373	10/ 5
February	42,177	28/11	17/ 9	23,223	11/ 0
March	46,782	30/ 6	17/ 7	26,119	11/ 2
April	48,173	30/ 6	17/ 7	46,922	12/10
May	53,650	33/ 0	17/ 7	40,317	15/ 0
June	55,123	32/ 3	17/ 6	40,804	14/ 9
July	56,180	32/ 1	17/ 3	41,077	14/ 8

The tonnage milled, it will be observed, has increased regularly month by month, an additional number of stamps having been put into commission. For the month of January the capacity was 110 stamps, while in July 150 out of the total of 160 were kept running. There is a prospect, therefore, of the milling capacity being still further extended to at least 60,000 tons per month. The total working profit for the half-year ended June 30th was £183,626, of which amount the sum of £112,911 was obtained during the last three months of the period. Capital expenditure during the period under review totalled £15,969. Development has been carried on as actively as possible, with gratifying results, as the accompanying statement will show:—

1912.	Linear Development. Feet.	On Reef. Feet.	Width. Ins.	Assay Value Dwts.
March quarter ...	1,916½	1,563	42·7	8·7
June quarter ...	4,222	3,173½	41·9	8·7

For the purpose of comparison, the following figures may be quoted:—

1911.	Distance Sampled. Feet.	Width. Ins.	Assay Value Dwt.
March quarter	3,235	28·0	9·6
June quarter	3,325	33·72	10·26
September quarter ...	1,411	31·5	10·3
December quarter ...	1,674	42·1	10·2

The ore reserves were re-calculated at the end of last year, and on December 31st the estimated payable reserves amounted to 1,925,346 mine tons of an average value of 6·73 dwts. At May 31st, 1911, just before milling operations commenced, the reserves were estimated at 2,035,108 mine tons valued at 6·62 dwts. The reduced tonnage, as was explained in the consulting engineer's report, was due to the elimination of certain low grade areas which, in view of the work done and information gained after the inception of milling, were considered to be unpayable.

PROGRESS AT "BARNATO" MINES.

Steady Increases in Profit—The Outlook at New Rietfontein, Glencairn, and Modderfontein.

The steady expansion of profits recorded by mines under the control of the Johannesburg Consolidated Investment Company is certainly one of the brightest features of the industry to-day. In January the aggregate profit earned by the seven productive subsidiaries of the group was £58,755. During the "short" month of February there was a temporary decline to £57,611, but in March the earning improved to £60,455, in April to £62,603, in May to £65,419, in June to £66,958, and in July a profit of £67,755 resulted. The New Rietfontein Estate is the only mine of the Barnato group which has not increased its profits since the commencement of this year. Thus the Consolidated Langlaagte's earning has advanced from £8,117 to £10,300, that of the Ginsberg from £5,790 to £7,216, of the Glencairn from £2,906 to £3,039, of the New Primrose from £17,015 to £19,339, of the New Unified from £4,826 to £5,069, and the Witwatersrand from £15,845 to £19,242. These are exceedingly satisfactory and encouraging improvements. It is, furthermore, assured that the profits will increase still more in the near future, if not the immediate future. About the middle of next month the New Consolidated Langlaagte equipment will start milling. There have been one or two trial runs of the plant, which have been quite satisfactory. Everything is now ready for a commencement of milling operations proper, but it is not anticipated that sufficient power will be forthcoming to operate the new plant for a fortnight or so. The Van Ryn Deep should be producing twelve months from date, and later on the Modderfontein Government Areas will enter the output list. Of course, the development and equipment of this latter property, with its huge area of 2,633 claims, will take many months of hard and patient work before a single ounce of gold is produced. It is, however, assured that the Government Areas will, within the next few years, become one of the most noteworthy producers on the Witwatersrand. Development is being pushed on with all speed. A considerable amount of time is, of course, occupied in cutting shaft stations, and it will be some time before rock drills can be employed in the vicinity of the north-east shaft as are being used in the north-west shaft section.

The New Primrose, Witwatersrand, Ginsberg, New Unified, and Glencairn are all doing well, and at the New Rietfontein there are encouraging features to be noted. Latest developments in the No. 1 shaft section, or the west end of the mine, are of a promising nature, and the management is hopeful of good returns from this area. Exploratory work is also commencing in the northern end of the mine between Nos. 4 and 5 shafts, and it is hoped that good results will be obtained from here also. Attention may again be directed to the substantial profits earned by the Glencairn on ultra low grade ore. There is little prospect of an improvement in the recovery at this mine, but there is every reason for believing that the mines will continue to earn fair profits for some years to come. A decline in grade of half a dwt. per ton or more would well-nigh render the Glencairn an unprofitable mine, unless a further reduction in the already remarkably low rate of expenditure could be brought about. Happily, however, there is every likelihood of the present grade being maintained.

Manicaland Mineral Output.

The mineral output of the Territory of the Companhia de Mozambique (Manicaland) for the month of July, 1912, is as follows:—Reef: Mill—Gold won (fine gold), 107 ozs., 19 dwts., 11 grs.; tons crushed 1,237; value £1,713 9s. 3d.

THE PRESENT POSITION OF THE E.R.P.M.

A Continuance of Fair Returns—The Cleaner Mining Policy Applied—Satisfactory Development Figures—The Question of the next Dividend.

The position of the East Rand Proprietary Mines, as indicated by the two quarterly reports which have appeared since the beginning of the year, cannot be regarded as other than satisfactory. Put as concisely as possible in figures, the salient points of the output over this period are as follows:—

1912.	Stamps.	Tons Milled.	Revenue per ton Milled.	Costs per ton Milled.	Working Profit Total.	Profit per ton Milled.
March quarter	820	471,750	32/1	21/8	£244,740	10/5
June quarter	820	473,250	33/6	21/5	285,876	12/1

By way of comparison, the accompanying brief statement relative to the performances of the two previous years may be added:—

Year.	Stamps.	Tons Milled.	Revenue per ton Milled.	Costs per ton Milled.	Working Profit Total.	Profit per ton Milled.
1910	820	2,126,334	27/3	15/6	£1,249,356	11/9
1911	820	2,194,552	25/0	16/8	913,561	8/4

The total working profit for the half-year ended June 30th was £530,616. The figures which will naturally attract most attention are those of recovery and costs, the former showing a notable increase on the averages of the earlier years, and the latter being little less expansive. The result, however, has been a marked improvement in the profits. An examination of the tonnage milled makes it evident that the rate of crushing has been reduced, for, if the quantity put through during the past half-year is not exceeded during the remainder of 1912, the total crushing by the end of the year will be in the neighbourhood of 1,900,000 tons. It is clear that the policy of cleaner mining has been adopted as far as possible, as has already been explained in the *S.A. Mining Journal*, and foreshadowed in Mr. H. Ross Skinner's report. Closer sorting has also prevailed, as is apparent in the monthly returns, although comparisons can scarcely be made to advantage in this connection, for the effect of approximately equal percentages of sorting depends very much upon the original condition of the ore dealt with. A sorting of, say, 9 per cent. on the class of material that was being sent to the E.R.P.M. mills at certain periods last year would be of considerably less importance than a sorting of 9 per cent. on the average grade of ore that is now being provided.

The following figures, taken from the monthly analyses of the Chamber of Mines, give a general view of the progress of the E.R.P.M. since the beginning of 1912. They show, apparently, rather a different tendency to that which appears in the aggregate sums quoted in the preceding table:—

	Tons.	Revenue.			Expenses			Profit.		
		£	s.	d.	£			£	s.	d.
January	164,550	213,565	28	3	173,231	21	1	67,108	8	2
Febr'ry	144,200	246,465	33	0	163,647	22	8	75,609	10	6
March	163,000	280,975	33	7	174,819	21	5	101,362	12	5
April	157,500	267,743	32	11	165,918	21	1	98,596	12	6
May	162,900	275,295	32	11	176,549	21	8	95,024	11	8
June	152,850	249,881	31	9	157,642	20	7	92,256	12	1

The tonnage milled in July is considerably less than it was in March, when the programme of betterment was taken in hand, and, in the same way, the recovery, which reached the high water mark of 33s. 7d. per ton in the same month, has been on the down grade. Expenditure, on the other hand, has been diminished, and profits continue to exceed £90,000 per month. It is possible, of course, to take a wrong view of these returns, unless one remembers that there is now no reserve gold to fall back upon for the purpose of adjusting the output declaration. The changes which were rendered necessary as a consequence of the methods previously pursued were of a somewhat revolutionary kind, the development was falling back, and already presented serious difficulties, and the problem was not so much to straighten things out again as it was to place them upon an entirely new footing. For this reason it would be unfair and unjustifiable to argue that an actual tendency, such as is indicated above, has set in definitely, and that the December output, for example, is likely to be as far below that of June as that of June is inferior, for example, to that of March. The more rapid development of the group of mines which are controlled by the company was a matter of urgency when the management of the E.R.P.M. passed into the hands of the Corner House. As was stated by Mr. H. Ross Skinner in his report upon the condition of the property: "The payable ore developed (during 1911) shows a shortage of 841,000 tons when compared with the actual ore mined. This shortage is accounted for by the curtailment of development operations, for financial reasons, in the latter half of the year, and by the difficulty of securing sufficient development faces for the required amount of work. . . . Concentration of work on the sinking of the secondary inclines and development shafts is, therefore, imperative in order to obtain additional levels as rapidly as possible." The statements regarding development operations for the half-year is as follows:—

1912.	Total Footage (excluding Shafts).	Distance Sampled. Feet.	Average Reef Width. Ins.	Av. Assay Value on Reef. Dwts.
March quarter ...	11,527	8,424	21·4	13·6
June quarter ...	14,270	10,367	26·0	11·2
For 1911 the figures under the same headings were:—				
1911	59,820	37,843	26·1	10·0

Although it has not yet been possible to accelerate the speed of development to any great extent, it is satisfactory to note that the reef widths exposed and the assay results obtained, especially the latter, are distinctly satisfactory. The amount provided for development in the working costs, namely, 3s. per ton milled, totalled £141,749 for the last half-year, and the expenditure on this account was, altogether, £70,200, which leaves a balance standing at the credit of development suspense account of £70,549. The expenditure on authorised votes during the same period, that is, votes on expenditure usually chargeable to capital, but to be met, as arranged, out of working profit, amounted to £99,384, the payments being allocated to reduction plant, pumping and air plant, surface haulage, crusher station, compounds, shafts, etc. The approximate financial position, after providing for all liabilities, including a dividend of 12½ per cent. for the half-year, but exclusive of the debenture issue of £1,500,000, was, as at June 30th, £193,967, less cash assets (stores and materials, sundry debtors, payments in advance, etc.), £146,756—balance, approximate cash position, £47,211. It may be remarked that the sum of £70,549 standing to the credit of development suspense account is included in the liabilities mentioned. A question of some importance arises in respect of the dividend for the next half-year. It is not difficult to calculate that, on the basis of the profits for the last six months, a somewhat larger dividend than 12½ per cent. may be looked for at the December declaration. A dividend of 15 per cent. has already been suggested in the financial press, but, obviously, very much will depend upon the aspect of the mine and the outlook generally, rather than on the funds actually available, when the time comes to decide upon the declaration. The returns of the next few months may be taken as a rough indication of what may be looked for in this direction, and for this reason they will doubtless be very closely watched.

THE CAPITAL STATISTICS OF UNION MINES.

The Financial Position in Various Districts—The Credit and Debit Side of the Mining Account—A Vast and Wide-Spreading Industry.

The Mines Department statistics of the Union of South Africa for July, 1912, include an appendix relating to the capital invested in mining undertakings of the Union, which is drawn up upon similar line to those which were published annually in the Transvaal to the end of June 30th, the date upon which the official year terminates. The statistics were not published in 1911, and those now presented include the figures relating to mining ventures in the Cape, Orange Free State, and Natal Provinces, as at 31st December last. It is inconvenient, and unnecessary, to publish the great array of figures at length, and the following summary will sufficiently indicate the salient features of the financial position:—

	No. of Companies.	Capital. Net Issued.	Debentures. Net Outstanding.	Temporary Advances.	Share Premiums. Net Amount.	Sundry Creditors, Stores, Wages, &c.	Outstanding Credit Balances, Dividends unpaid, Appropriation Account, &c.	Total Debit Side.
		£	£	£	£	£	£	£
TRANSVAAL.								
Witwatersrand … …	132	62,325,137	8,541,198	2,824,487	8,602,449	2,775,519	18,108,610	103,177,400
Heidelberg … … …	20	2,953,574	83,200	190,824	36,345	18,246	45,692	3,327,881
Klerksdorp … … …	23	2,820,666	—	186,469	21,636	27,078	32,418	3,088,267
Pretoria, Barberton, Pilgrims Rest, and Pietersburg … …	55	5,248,425	152,038	79,613	247,906	91,541	362,952	6,182,275
Totals for Gold Mines	230	73,347,802	8,776,436	3,281,393	8,908,336	2,912,184	18,549,672	115,775,823
Diamond Mines … …	7	237,038	—	9,000	31,625	359,279	724,267	1,361,209
Coal Mines … … …	27	3,800,835	318,177	50,916	816,869	97,903	805,617	5,890,317
Base Mineral Mines …	39	1,471.925	23,206	142,701	65,554	62,384	199,098	1,964,868
CAPE.								
Gold Mines … … …	5	157,601	—	290	—	3.447	—	161,338
Diamond Mines … …	12	5,732,278	1,662,495	25,993	132,083	629,063	5,642,217	13,824,129
Coal Mines … … …	5	253,097	—	131	715	2,592	52,472	309.007
Base Mineral Mines …	23	1,472,289	4,000	78,766	8,668	67,105	552,428	2,183,256
ORANGE FREE STATE.								
Gold Mines … … …	6	290.035	—	247	—	377	213	290,872
Diamond Mines … …	19	2,649.619	8.158	471,438	108,618	63,098	594,216	3.895,147
Coal Mines … … …	4	1,102,680	—	335,453	—	19,655	9,235	1,467,023
NATAL.								
Gold Mines … … …	6	59,732	—	899	2,000	3,154	—	65,785
Coal Mines … … …	19	2,576,939	315,763	92,667	7,500	135,025	424,063	3.581,957
Base Mineral Mines …	5	44,078	—	10	604	244	27	44,963

The following tables show the principal assets of the mining companies included in the statement above. The balance, not quoted, include options, sundry debtors (including rents and interest due, and payments in advance), stores, materials, live stock, etc., undistributed balances (including amount to be eventually distributed over other items and amounts to be eventually carried to appropriation account), and consignment account (produce in transit). With regard to the column, "Deficiency of Assets," it may be pointed out that the figures do not refer to the producing and dividend-paying group of mines of the Witwatersrand, nor to the producing and dividend-paying group of mines of the Pretoria, Barberton, Pilgrims Rest and Pietersburg districts, since these show no deficiency.

	Mining Property. Book Value.	Estate Property.	Development and Equipment. Net Value.	Investments.	Cash.	Deficiency of Assets.	Total Credit Side.
	£	£	£	£	£	£	£
TRANSVAAL.							
Witwatersrand …	39,539,875	558,608	47,976,530	2,006,603	6,459,261	1,167,729	103,177,400
Heidelberg … …	1,655,013	110,258	606,780	129,934	213,566	545,077	3,327,881
Klerksdorp … …	1,432,974	25,091	453,911	164,014	180,906	623,466	3,088.267
Pretoria. Barberton, Pilgrims Rest, and Pietersburg …	3,458,635	84,192	1,255,613	323,907	347,796	241,074	6,182,275
Totals for Gold Mines	46,086,497	778,149	50,292,834	2,624,458	7,201,529	2,577,346	115,775,823

(*Continued on next page.*)

	Mining Property. Book Value.	Estate Property.	Development and Equipment. Net Value.	Investments.	Cash.	Deficiency of Assets.	Total Credit Side.
	£	£	£	£	£	£	£
Diamond Mines	166,703	—	65,528	9,433	761,805	28,525	1,361,209
Coal Mines	2,576,125	177,107	2,098,722	61,631	449,772	83,804	5,890,317
Base Mineral Mines	1,000,797	23,927	376,384	21,111	73,891	224,703	1,964,868
CAPE							
Gold Mines	129,402	—	15,369	—	492	15,067	161,338
Diamond Mines	6,364,052	150,347	327,263	3,661,761	643,872	223,299	13,824,129
Coal Mines	206,883	—	71,340	8,895	1,733	2,284	309,007
Base Mineral Mines	798,924	15,168	449,179	206,348	35,919	58,377	2,183,256
ORANGE FREE STATE.							
Gold Mines	1,316	—	11,339	13,713	13,448	55,191	290,872
Diamond Mines	1,719,993	58,905	1,103,652	205,133	78,382	165,557	3,895,147
Coal Mines ..	951,677	8,063	105,354	151,225	5,276	135,972	1,467,023
NATAL.							
Gold Mines	40,337	—	15,501	—	2,665	1,844	65,785
Coal Mines	1,638,182	44,352	1,153,089	7,015	209,643	70,286	3,581,957
Base Mineral Mines	31,170	—	3,382	—	144	3,027	44,963

DIAMOND PRODUCTION FOR THE HALF-YEAR.

Figures for January-June, 1912—Some Notable Totals.

THE following statistics of production of diamonds for the Union during January-June for the current year were compiled by the Department of Mines, and issued with the statistical return for July:—

	Production from Mines.			Production from alluvial, estate, river diggings and miscellaneous.			
						Total Production.	
	Loads washed 1 Load = 16 cubic ft.	Weight carats.	Value £	Weight carats.	Value £	Weight carats.	Value £
Pretoria	4,405,136	939,629·38	845,648	1,423·14	1,434	941,052	847,272
Klerksdorp—							
Bloemhof District	—	—	—	21,450·75	99,865		
Mooifontein	—	—	—	18,075·75	80,020	41,101·57	190,062
Other Places	—	—	—	1,575·07	10,177		
Transvaal Totals	4,105,136	939,629·38	845,648	42,521·71	191,496	982,154·09	1,037,144
The value per carat from mines was 18s. and from alluvial 90s. 1d. per carat.							
Kimberley	3,149,670	1,031,598·25	2,528,977	3,607· 0	21,197	1,040,890·75	2,557,422
Barkly West	23,468	852· 5	1,573	36,687· 0	191,907	37,539· 5	193,480
Herbert	—	—	—	641·75	3,028	641·75	3,028
Kuruman	—	—	—	347· 0	955	347· 0	955
Vryburg	—	—	—	3·13	7	3·13	7
Cape Totals	3,173,138	1,032,450·75	2,530,550	41,285·88	217,094	1,079,422·13	2,754,892
The value per carat for mines was 49s. and for alluvial 105s. 2d.							
Boshof	177,097	54,575·25	56,173	308·57	2,080	54,883·82	58,253
Fauresmith	1,820,986	206,377·25	625,722	—	—	206,377·25	625,722
Kroonstad	519,121	68,422· 0	64,443	27·88	72	68,449·88	64,515
Winburg	6,927	816·57	773	150· 0	150	966·57	923
Ficksburg	—	—	—	2· 0	2	2· 0	2
O.F.S. Totals	2,354,131	33,191 07	747,111	488·45	2,304	330,679·52	749,415
The value per carat from mines was 45s. 3d., and from alluvial 94s. 4d. per carat.							
Union of S.A. Totals ..	10,132,105	2,302,271· 2	4,123,309	84,299 04	410,894	2,392,255 74	4,541,451

SIX MONTHS OF GOLD WINNING.—II.

The Progress of the Industry in the First Half-Year—Results of Gold Fields, Albu, Goerz, E.R.P.M., and Anglo-French Mines.

In continuation of the article appearing in our issue last week, we herewith state the salient features of production, profit-earning, etc., secured by the mines of the Consolidated Gold Fields of South Africa, the General Mining and Finance Corporation, and Messrs. A. Goerz and Co., during the first six months of the current year. For purposes of comparison, the results secured during the corresponding period of 1911 are also stated. As in the preceding article, the statistics given are in each period the aggregate returns as declared each month to the Chamber of Mines, and do not include gold reserves. The mines under Gold Fields control earned in the aggregate about £42,000 less than in the 1911 half-year, although operating expenses have been further reduced. Clearly the decline in grade has been larger than has been compensated for by more economical working. Working costs at the General Mining subsidiaries have risen, but with the exception of the New Goch and the Roodepoort United Main Reef, the subsidiaries under "Albu" control did better this year than last. Save in the case of Geduld, the working results of the mines under the control of A. Goerz & Co. are very disappointing. At the East Rand, although the grade is 8s. per ton better, with costs 6s. per ton higher, and a consequent net gain of 2s. in average profit per ton, this has not been sufficient to offset a reduction of 174,000 tons in the output. As to the Anglo-French Company's subsidiary—the New Kleinfontein—costs have risen and more than counterbalanced a slight betterment in revenue. Figures for Benoni are not given, as this company was working for four months during the current year only. The profit and tonnage results are stated hereunder:—

	1911.		1912.	
	Ore Milled.	Profit. £	Ore Milled.	Profit. £
CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA.				
Jupiter	143,050	18,804	231,700	30,905
Knights Deep ...	353,830	147,522	352,630	108,293
Luip'rdsvlei Est.	101,422	15,231	99,274	7,333
Robinson Deep...	286,500	183,539	301,900	216,625
Simmer & Jack...	424,500	294,150	434,000	261,541
Simmer & Jack E.	176,270	15,743	188,060	23,930
Simmer Deep ...	258,050	36,256	277,400	20,595
GENERAL MINING AND FINANCE.				
Aurora West ...	66,186	15,468	76,516	16.642
Cinderella Cons.	95,746	23,269	102,718	24,180
Meyer & Charlton	35.715	26,497	83,477	97,854
New Goch ...	166,822	75,221	158,653	28,971
Roodep't U.M.R.	186,960	38,159	179,661	26,402
Van Ryn	194,320	128,060	232,450	141,844
West Rand Cons.	148,090	24,090	116,100	28,054
GOERZ GROUP.				
Geduld Prop. ...	68.710	19,213	84,320	25,540
Lancaster West	128,930	28,216	125,720	7,591
May Consolidated	91,340	66,534	78,152	38,801
Princess Estate	80,640	28,566	101,967	3,847
E.R.P.M. ...	1,119,560	534,624	945,000	529,954
ANGLO-FRENCH GROUP.				
New Kleinfontein	223,554	116,745	247,530	103,000

Results on a ton milled basis are as follows:—

	Revenue per ton.				Expenses. per ton.				Profit per ton.			
	1912.		1911.		1912.		1911.		1912.		1911.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Consolidated Gold Fields. —												
Jupiter	20	4	24	10	17	8	22	3	2	8	2	7
Knights Deep	17	6	19	9	11	5	11	5	6	1	8	4
Luipaardsvlei	18	6	18	11	17	0	15	11	1	6	3	0
Robinson Deep. ...	31	10	30	11	17	4	18	2	14	6	12	9
Sim. & Jack Prop.	23	4	25	5	11	4	11	11	12	0	13	6
Sim. & Jack East	17	11	19	8	15	3	18	0	2	8	1	8
Simmer Deep	18	1	20	0	16	7	17	3	1	6	2	9
General Mining.—												
Aurora West	24	2	23	10	19	9	19	1	4	5	4	9
Cinderella...	29	2	28	0	24	5	23	3	4	7	4	9
Meyer and Charlton	41	5	32	9	18	0	18	0	23	5	14	9
New Goch	21	4	26	0	17	7	17	0	3	9	9	0
Roodepoort United .	20	6	21	11	17	8	17	11	2	10	4	2
Van Ryn	27	9	28	9	15	4	15	7	12	5	13	2
West Rand Cons. .	25	3	23	7	21	10	20	4	3	5	3	3
A. Goerz and Co.—												
Geduld Prop.	26	4	25	8	20	3	20	1	6	1	5	7
Lancaster West ...	22	4	24	2	20	10	19	11	1	6	4	3
May Consolidated .	26	0	29	4	16	1	14	10	9	11	14	6
Princess Estate.. ...	25	3	33	2	26	1	26	1		*10	7	1
East Rand Props. ...	33	0	25	1	21	9	15	7	11	3	9	6
Anglo-French Group.—												
New Kleinfontein .	28	7	28	3	19	9	17	10	8	9	10	5

*Loss.

The Jupiter, it will be noted, is one of the few Gold Fields ventures that has done better, earning nearly £31,000, in contrast with £18,800. This is entirely the result of expansion in operations, there being a rise of 89,000 tons in quantity treated; saving in costs is offset by the drop in grade. The policy of extending life by the milling of "bastard" reef has resulted in lower profits being earned by the Knights Deep, whose net result shows a decrease of £39,000. On the other hand, the profit of the Robinson Deep marks further recovery, which is attributable in practically equal proportions to increased tonnage and grade with reduced expenditure; the gain amounts to £33,000. Expansion in output has proved insufficient to counterbalance a decline of 2s. per ton in the yield of the Simmer and Jack Proprietary, whose profit exhibits a decline of £33,000. Similar features are noticeable in the case of the Simmer Deep, which earned £16,000 less. In regard to the Simmer and Jack East, reduced costs have permitted a somewhat larger profit to be earned. From the statistics relating to General Mining and Finance Corporation concerns it will be seen that the Aurora West has considerably increased its tonnage, a further 20 head of stamps coming into operation during the latter part of the period. To a slight extent the yield also rose, but owing to increased cost the expansion in profit is under £1,200. Growth in the expense ratio almost nullified the effect of better grade and expanding output on the part of the Cinderella. Meyer and Charlton scores a large advance, the profit being £97,000 odd, in contrast with £26,500. This is partly due to the fact that during the first portion of 1911 operations were seriously interrupted by the reorganisation of the plant, the full benefit of which has been reaped in the latest period, the increase in tonnage milled being 47,700 tons. The other factor is a jump of no less than 8s. 8d. in the grade of ore milled. Costs remaining the same, the average profit rose to a corresponding extent. At the New Goch, the grade of ore fell markedly; and as a result the profits declined from

£75,000 to under £29,000. The failure of the stopes may also be said to be responsible for the shrinkage exhibited by the Roodepoort United. At the Van Ryn a drop of 1s. in grade was more than counterbalanced by increasing the tonnage, and the profit has risen nearly £14,000. Expansion in output and some recovery in grade is responsible for the small improvement in the West Rand Consol's profit, which is £28,000, in contrast with £21,000. The grade of the Geduld has slightly improved, but the expansion in profit is mainly due to enlargement of the scale of operations. At the Lancaster West reduction in tonnage was accomplished by fall in grade and growth in expenditure, these factors together seriously curtailing the profits. It should, however, be pointed out that a decided improvement occurred during the latter portion of the half-year. With regard to the Princess Estate, operations were greatly interfered with during reorganisation; here again the best results were secured during the past few months.

THE DIAMOND CUTTING INDUSTRY.

How the Stones are Cut and Polished.

A DIAMOND factory (says the *Pall Mall Gazette*) does not mean a factory where imitation diamonds are made, but a place where real diamonds are cut and polished from the rough stones. There are only about four such factories in London, and altogether only about thirty diamond polishers employed. All these men are of Dutch descent, their ancestors having come to England from Holland some time in the eighteenth century, and their sons and grandsons have in turn been apprenticed and learnt the secrets of diamond polishing and cutting. There are four branches of the trade; therefore, in a factory the men are divided into cutters, setters, polishers, and polishers' labourers who assist the polishers.

DIAMOND CUT DIAMOND.

It is a privilege to be allowed to peep behind the scenes and see the various stages through which a diamond passes until it is ready for setting, and the experience is a most interesting one. "Perhaps it would be better to start from the very beginning," said the manager of the factory, "and then you can see how the stone looks as it passes through the various processes. Here are the rough stones. They do not look like flashing diamonds? No; as the ordinary person would say, they seem just dull, dirty-looking grey particles of stone. That is the rough diamond. The first thing to be done is to cut the stone, and to do this the cutter decides whether he will cut it by hand or machinery." In this particular factory the stones were all cut by hand until comparatively recently, but now machinery is used, which renders the process much less laborious. It is really a case of diamond cut diamond, as, by rubbing two stones against each other, one gradually assumes the shape desired and the requisite thickness. The cutter has a long stick, on top of which is a brass cup in which he puts a certain kind of cement; in this he embeds the rough stone. The cement must be heated first, and the cooling process is most primitive, as the cutter merely blows on the hot cement, and tries it against his lips to see if it is cold enough to commence cutting. "Does not that burn your mouth?" the cutter was asked. "Well, I suppose it does," he said, "but it merely dries the lips, and one can always use something to minimise that. With the new machine the cooling is done by dipping the stick in water." Which certainly seemed the better way.

DIAMOND DUST FOR POLISHING.

On the way a diamond is cut a great deal depends, because the cutter decides which way a stone is to be taken, and if it is done the wrong way the value of the stone is depreciated; if a flaw is at the back of the stone, its lustre is much dimmed. "Pure stones," said the cutter, "are very rare, and, of course, a perfectly pure stone is extremely valuable." Taking up the two sticks in which he had placed two rough diamonds, he proceeded to cut one by hand—that is to say, he slowly rubbed one against the other, the minute particles falling into a box, in the bottom of which was a very fine sieve through which the dust fell into an air-proof box. If the stone is a large one, this hand-cutting is very laborious, as it requires a great amount of strength to cut it, and naturally the process is rather slow. By the machine it is really the same process, except that one stick is held in place by the machine, which revolves rapidly, the cutter holding the other stick in his right hand. Each side of the stone has to be cut separately; it is generally the back, or pointed part, of the stone which is cut first, the flat side being treated next. "What becomes of the diamond dust?" "Well," said the cutter, "it is used for polishing. Mixed with olive oil, it makes a paste which is put on the plate used by the polisher. Inferior diamonds are ground down to dust also, so that nothing is wasted."

SIXTY-FOUR FACETS.

The setter now takes the diamond and puts it into a mould composed of tin and lead, which is brought to a white heat, and when the diamond is slipped into this the mould is immersed in water for the purpose of cooling it. The setter has to so place the stone that it will be at the proper angle for polishing, be it the side, back, or front. Looking at a diamond, one sees a flat surface in the middle of the stone; this is called the table or top part of the diamond; the back or pointed part is called the culet. When both these are made, the facets have to be cut; altogether there are 64 facets, no matter what size the stone may be. To the naked eye it is absolutely impossible to discover these facets, they are so minute; but the polisher can see them without a magnifying glass; his eyes are so trained to the work that he makes the facets so many on top, so many at back, and so many at the sides. The mould is held in position by a metal holder, the diamond being barely visible through the mould, and, although the stone is only lightly placed on the revolving plate, the high speed at which it revolves is sufficient to cut the facet in the required position. Each time a facet is done the stone has to be taken out of the mould by the setter and refixed at a different angle until the whole sixty-four are made. It should be added that when sixteen facets are made the stone is returned to the cutter for improvement in shape. It is sometimes cut over twice to make it specially brilliant.

Government Gold Mining Areas.

By a misprint the cablegrams relating to the assay results from the north-east and north-west shafts, which were referred to in our last issue, were somewhat confused. The cabled information with regard to the latest strike, that in the north-east shaft, has been as follows:—August 20th: "North-east shaft reef struck at north of shaft faulted downwards. Portion exposed assays 4·7 dwts. per ton over 20 inches. Expect expose reef over whole shaft in a few days when complete assays will be published. August 26th: "North-east shaft downthrow of reef 11 feet. Reef south of fault 9½ dwts. over 21 inches. Average of reef over whole shaft, 7·7 dwts. over 20·5 inches."

Rhodesian Section.

LATEST MINING NEWS.

An Improved Labour Position—The S.A. Prospecting and Concessions Syndicate—Progress at the Pickstone—Rhodesia Consolidated—The Jumbo—Shamva Developments—The Forbes Rhodesia Report—Position at the Queen's—Eldorado Ore Reserves.

Apparently the position in regard to native labour in Rhodesia is much improved. Information received at the head office of the R.N.L. Bureau shows that some 900 mine labourers are on their way from Northern Rhodesia. Some of these boys are now arriving, and the others will arrive almost daily during the next few weeks. At date the Bureau have unfulfilled applications for only 25 of this class of labourer, and the requirements of mines in later months, in so far as at present notified, are limited to 190 natives for delivery in September and 170 in October. It has not yet been arranged what is to be done with the natives expected. This is a rather unusual state of affairs for the industry in Rhodesia, and it naturally is one that is hailed with universal satisfaction.

* * * *

The secretary of the S.A. Prospecting and Concessions Syndicate, in a circular to shareholders concerning this property, states:—The superintending engineer cables that at 225 ft., in the south drive from No. 1 White Wings shaft (west lode 100 ft. level), the assay value is 4 ozs. per ton, and that at a depth of 205 ft. level east lode the value of 8 dwts. per ton has been obtained. It will be remembered that the west lode has been traced on the surface for a length of some 2,800 ft., and that by the end of last year Marks' shaft was approximately the centre of extensive development of payable ore, the lode ranging from 100 ft. to 160 ft. in width, in which pay sections had been proved over considerable widths, running to as much in one crosscut as 68 ft. The fact now reported, that a strike of rich ore has been discovered at a distance of 575 ft. to the south of Marks' shaft, is unquestionably a factor of very great importance. It will also be recollected that the east lode, which has already been traced for some 1,200 ft. in length, runs at a distance of a few hundred feet fairly parallel to the west lode, and that it has already been proved at the 100 ft. level by the opening up of extensive bodies of payable ore. In view of the fact that the superintending engineer is now on his way home on short leave, the directors think it will be desirable to hold the annual general meeting on a date when he would be able to be present and give all particulars regarding the mine.

* * * *

The statutory meeting of the Pickstone Company was held in Salisbury last week, when a glowing statement was made with regard to its prospects; and, in the afternoon, something in the nature of a sensation was caused by the exhibition in the hall of the Standard Bank of some quartz from the mine, which is probably the most extraordinary gold-bearing rock ever found in Rhodesia. The "stuff" comes from the reef known as the Pickstone No. 1 east, which is said to have been proved over a distance of 1,200 feet in the strike and to a depth of 200 feet. Milling on behalf of the company only commenced on the 1st August, and, although the return from the mine for July was abnormal, the company will derive no benefit, as all the profits for that month go to the vendors. This return may, however, foreshadow what may be expected in the future. The report presented to the meeting states that a new reduction plant is to be erected at once, and is to consist of two five-stamp mills, two Chilian mills, a suction gas plant of approximately 120 h.p., and a sand and slimes plant capable of treating 100 tons per diem. During the construction it is intended to mill from the quartz reefs of the Pickstone blocks. As regards the mine and its prospects, the chairman, in moving the adoption of the report, stated that in the Pickstone No. 1 east mine, development work continued to give surprisingly good results. In the Pickstone No. 1 east extension the west drive had run continually in reef showing visible gold from the shaft to its present face—a distance of 254 feet—at which point the reef fully maintains its strength. In tho only winze sunk in the ore body there is reef in the face of this at a depth of 104 feet, showing strong visible gold. At the conclusion of the chairman's remarks Mr. Hamshawe and Mr. Olds were appointed directors.

* * * *

The report of Rhodesia Consolidated, Limited, for the year ended 30th September last, states that, owing to the stagnation of the mining market, the period of review has been one of singular difficulty for a parent mining company, and the result of the year's work shows a loss of £11,467. The cash in hand at the end of the year amounted to £6,012.

* * * *

The following particulars are extracted from the quarterly report of the Jumbo G.M. Co. for the period ended 30th June:—Ore developed at 1st April, 12,455 tons, average value 9·6 dwts. Add excess tonnage in stopes and development rock taken in (including 400 tons Commonwealth ore) 5,954 tons—18,400 tons; ore crushed 1st April to 30th June, 8,710 tons; ore reserves at 30th June, 9,690 tons; average value, 9·57 dwts.

* * * *

During mail week, the Board of the Shamva Mines, Ltd., received the following cablegram from Bulawayo:—"Gully adit advanced a further 5 ft., making 10 ft. in all; average assay value over the 10 ft., 4·4 dwts., continuing." To this the following official note is added: This exposure of ore extends the strike of ore body on the third level a further 340 ft. over that already exposed by development, making up to the present 750 ft. along the strike.

* * * *

The report of the Forbes Rhodesia Syndicate for the year ended December 31, 1911, states that the policy of the company has been to continue development on the various claims acquired. The plant at the Redrup's Kop claims, consisting of a large Blake crusher, five-stamp mill, Chilian mill, cyanide plant, and slimes plant, has been installed, capable of treating 2,000 tons per month, and should at a quite early date be ready to begin working. The syndicate now owns a five-sixth interest in the property. The running of the mill at the Sheba-Bongolo mine has been restricted, owing to a short supply of water, due to the scarcity of rain. The free option over the Anchor claims has been extended to September 16. According to the latest information the shaft is down 110 ft. Since December 31, 1911, the company has taken on tribute 33 claims called the "Blanket Reef" in the Gwanda district, and the mill has been running since March. Here, too, operations have been restricted owing to shortage of water. The profit and loss account shows a net profit on the year's working of £210.

* * * *

The Queen's Mine (Bembesi) is now in a particularly interesting position, not by reason of the high values which are being won by the reduction plant, but on account of the vast possibilities which loom up in front of the mine. Apparently the report of the company is exceedingly optimistic; in point of fact, if it errs at all it errs on the right side, and nothing has been said by the directors which is not fully justified by the values, widths and strike of the reef now being opened up. To date, the first four levels have yielded no less than 140,000 tons of pay ore, of which 100,000 tons have been milled, or, in other words, each level has yielded 35,000 tons of high grade stuff. Further, the later developments of the property are highly interesting. On the eastern end of the mine a new shoot is now being opened up on the first level with very gratifying results, while the 5th level at a depth of 560 ft. from the surface will presently be pushed ahead with machine drills. It may be mentioned that the new main shaft has already cut the reef, and that the 6th level will soon be in course of development, with the probable result that by the end of the year the very large additions to the ore reserves will warrant the erection of a much larger reduction plant.

* * * *

In concluding his report on the operations at the Eldorado during the past year, Mr. H. A. Piper, the recently-appointed consulting engineer, writes on the all-important question of ore reserves. The total at the end of the year was 149,749 tons valued at 15·13 dwts., reducing high values, as against 197,343 tons valued at 16·36 dwts. for last year. This shows a serious decrease of 47,594 tons. The tonnage is made up as follows:—Main Reef, 51,709 tons, value 31·97 dwts.; Parallel Reef, 81,489 tons, value 6·16 dwts.; broken ore in stopes, 6,171 tons, value 8·57 dwts.; broken ore dumps and in bins, 10,380 tons, value 5·50 dwts.; total tons 149,749, value 15·13 dwts. The large decrease in the ore reserves is mainly accounted for by the 8th level fault, and partially by the large amount of time to complete the deadwork necessary from the main incline shaft, while a larger proportion of the parallel reef than hitherto has proved unpayable. At the same time, I do not consider the position gives cause for anxiety provided the 9th and 10th levels open up as indicated, and every effort will be made by the management to complete the vertical shaft from which the mine can be more expeditiously and cheaply opened up. *Conclusion.*—I consider the year under review has been most successful, and I see no reason why the present returns should not be maintained for some time to come. At the same time the importance of rapid development with the object of augmenting the ore reserves is constantly before us, and I fear before the new main vertical shaft is completed a further decrease of ore reserves will be recorded. A new system of calculating the exceptionally high grade ore was introduced last December, which, in my opinion, is quite correct. Exceptionally high grade ore is always difficult to deal with, but it is evident from the milling returns that the deductions in the past have not been sufficient; for instance, in March, 1911, the ore reserves were valued at 16·3 dwts., while the grade of ore milled was 12·43 dwts. The reserves for the year under review are valued at 15·13 dwts., which, in my opinion, is about 2½ dwts. too high, and the more drastic reductions now in force will gradually right this.

THE RHODESIA MUSEUM.

The Geological Collection—A Progressive Institution.

We are in receipt of a copy of the tenth annual report of the Rhodesia Museum, Bulawayo. In their report for the year 1911, the Committee state: " The past year has shown that the Rhodesia Museum is of growing usefulness and educational interest to the public, though the period has been one of important changes in constitution, staff, and method." The withdrawal by the Rhodesia Chamber of Mines (Incorporated) of the grant arranged in the agreement of the 8th January, 1910, leaves the control of the Museum in the hands of the Bulawayo Municipal Council and the Rhodesia Scientific Association, which each nominate four members of the committee, while the Administration is represented by one seat. As an act of appreciation for the assistance of the Chamber of Mines in the past, it has been asked to nominate two members of the committee, the number of which now stands at eleven. The contributions of these bodies appear under the list of grants and donations. Bye-laws for the conduct of business in committee are being considered. The committee retains in view the desirability for a closer association between the Geological Survey and the Museum, and hopes that it may be possible to work in the Department of Geology with the Survey. It is felt that the time has arrived when the Government should take over the Museum and administer it as a public institution. Nothing, however, has resulted from the overtures already made to that end. During the year accessions in the Geological Department numbered 41, and included some 137 specimens. Very little collecting was carried out by the staff, with the result that the total number of accessions is smaller than usual. As previously mentioned, very little laboratory work was carried out. Mr. F. P. Mennell kindly arranged a small collection of rocks; this serves a useful purpose. The labelling of the mineral collections is still proceeding. It is hoped soon to display the palæontological collections when cases are available for that purpose. An extensive collection of European and South African specimens is possessed by the Museum. The following specimens received are of special interest:—Manganese minerals, and particularly good specimens of dufrenite from Hout Bay and Cape Colony rocks (Franklin White). Vein-quartz containing crystals of mispickel with visible gold included, near Bulawayo (S. T. Watts). " Yellow ground " with ilmenite and diopside, Matabeleland (W. H. Penny), copper minerals and rocks, Skipper Mine, Sinanombi (F. P. Mennell), Corundum rock, Bembezi (W. H. Kenny). Amygdaloidal epidiorite, near Bulawayo (J. Falk and A. E. V. Zealley). Fossil Plants, Cape Colony (Kimberley Museum). Transvaal tin ores (W. J. Gau), Parahopeite, Broken Hill (Franklin White), tin ores, German S.W. Africa (H. S. Henderson). Stalactitic calcite, Oudtshoorn (W. E. Tongue). Cassiterite in greisen, Enterprise District (M. Bartlett and Goerz). Cassiterite in greisen, Victoria (J.H.M. Syndicate). The exchanges mentioned above resulted in the acquisition of a large amount of extremely valuable minerals, rocks and fossils, which are too numerous to detail. By their possession the mineral collection, especially, has largely expanded and improved in quality.

Sir Abe Bailey and " Amal. Props."

The *Financial Times* has the following:—It will be remembered that it was officially announced on the 23rd ultimo that the outstanding differences between the Amalgamated Properties of Rhodesia and Sir Abe Bailey, which were the subject matter of legal proceedings, had been amicably settled, but the terms of the agreement were not divulged. We note, however, that the *South African Mining Journal*, in its issue of 13th July, just to hand by mail from Johannesburg, refers to a cable reporting the terms to be as follows:—Sir Abe Bailey to take back all the properties he sold to the " Amal. Props." and 400,000 Rhodesia Copper shares, and also loan the " Amal. Props." £400,000 for a term at 5 per cent., in return for which he shall have a call on the unissued capital. Why have not the shareholders been officially informed of the exact terms of the arrangement before this? They are surely entitled to have the information as much as anyone else.

THE RHODESIAN GEOLOGICAL SURVEY REPORT.

A Belated Appearance—The Director on the Selukwe District.

THE report of the Director of the Geological Survey of Southern Rhodesia for the year 1911 makes a belated appearance. The document in question was presented to the Legislative Council early in the year, but it has only just been made public. The urgent need of a Geological Survey in Southern Rhodesia has long been recognised and agitated for. When in 1910 Mr. H. B. Maufe was appointed Director, and the work began, it was felt that at last a great and long-felt want had been supplied. We have nothing but praise for the work carried out by Messrs. Maufe, Zealley, and Lightfoot, but the method of publication is certainly to be condemned. Fresh discoveries are constantly being made in both Matabeleland and Mashonaland. New districts are continually being exploited. Unlike the Union of South Africa, there is no dearth of prospectors in Rhodesia, and it is most essential that, in the best interests of the country, the efforts of the men who go out into the unknown with pick and pan should be encouraged and aided in every way. It is necessary that the observations of trained geologists embodied in the report of the Geological Survey should be communicated to the country at large at the earliest possible date. The old apothegm, " Bis dat qui cito dat," has a special application here. For instance, the Report contains a highly instructive description of the " Geology of the Victoria Tin Field " by Mr. Maufe. Naturally, the value of this would have been much greater had it been published at the time of the tin boom, instead of months afterwards, when the Victoria cassiterite areas have gone more or less out of favour. Presumably, the belated appearance of the report is due to the fact that it was printed oversea. To publish the report in England in order to save a paltry sum in the cost of production is assuredly a " penny wise pound foolish " policy, which the Government of a progressive country like Southern Rhodesia should not be guilty of. The Report contains much that is of vital importance to those engaged in mining operations in Southern Rhodesia, and particularly in the Selukwe and Victoria districts.

Included in the publication are the following:—" The Geology of the Country around Selukwe," " The Geology of the Victoria Tin Field," and " The Asbestos Quarries of the Victoria District," by Mr. Maufe (the Director); notes on the " District including Selukwe Commonage, and the Country East and South of it," and " Claims pegged for Aluminium near Selukwe," by Mr. A. E. V. Zealley; The District South-west of Selukwe " and " The Claims of the Great Sabi Coal Syndicate, Victoria District," by Mr. Lightfoot. The first-named of these papers, " The Geology of the Country around Selukwe," is hereunder reproduced:—

This preliminary account of the field operations around Selukwe refers to the country lying chiefly to the south of Selukwe Commonage, bounded on the east by the Lundi River, on the west by the Selukwe Reserve, and extending southwards to the Amapongokwe River. The dominant physical feature is the curved range of hills, which form an immense cirque surrounding the township on the north, east and west, but open to the south. The hills culminate in the mountainous group north of the town, whence a spur runs out northwards beyond the Wanderer mine. East of this group of hills is a lower, but prominent range of norite hills trending NN.E.-SS.W., and known as the Selundi Range. This rectilinear range separates the Umtebekwe and Little Tebekwe rivers, which run in parallel courses on either flank. Beyond the Selundi Range is lower undulating country marked by groups of prominent kopjes. West of the cirque the country is seamed by ridges and valleys trending north and south, but on the whole it falls gradually westwards to the Lundi River. For the most part the ridges have smooth flowing outlines, but occasionally rise up into rugged kopjes, where some change in the rock formation takes place. Within the cirque itself the ground is trenched by innumerable ravines, which drain away southwards into the Umtebekwe River. Much the greater part of the district is occupied by foliated gneisses and schists, the non-foliated rocks, consisting of norite, granite, and dolerite, forming but a small portion of the surface. Of the foliated rocks those of igneous origin are more abundant than those of sedimentary origin, whilst, as noted above, the non-foliated rocks are entirely igneous intrusions. The area is thus in the main occupied by rocks of igneous origin, though representatives of the sedimentary schists are not wanting. The metamorphism of the rocks, and their deep weathering, often assisted by a wide mineralisation, renders the elucidation of such an area one of great difficulty, for clear sections at the junctions of rock-masses, so essential in unravelling an igneous complex, are rarely to be found. Many points, therefore, must remain in doubt for the present, and some of the conclusions expressed in the following may require modification in the light of fuller knowledge. The dominant geological feature is a large plutonic complex, extending from Selukwe Commonage for a distance of some 10 miles in a south-south-westerly direction and measuring four to five miles across from east to west. This complex consists of a core of granite, called the Mont d'Or granite, which has been intruded into a mass of ultra-basic rock now composed of serpentine and talc-schist. The latter rock-mass now encircles the granite on the north, east, and south. Both masses contain large inclusions of epidorite and other rocks, and the granite also contains inclusions of serpentine and talc schist. The complex is bounded on the west by a strong structural line trending NN.E. and SS.W., and marked by the intense shearing of the rocks in its neighbourhood. Beyond this line the country is occupied by an immense mass of foliated granite, called the Impali gneiss, on account of its gneissose development in the Impali Valley. On the east of the above plutonic complex is a comparatively narrow belt composed of the schists into which the complex is intruded, followed by the norite instrusion of the Selundi Range, which also has the common NN.E.-SS.W. trend. Beyond the latter range is another large area of banded gneiss similar to that of the Impali. Both these gneisses contain many inclusions of schist, and also several intrusions of unfoliated granite, whilst all these rocks are traversed by dykes of dolerite and basalt. Not only is the Selukwe plutonic complex the dominant feature of the geological map. It is also the chief repository of the mineral wealth of the district. The serpentine and talc-schist is the home of the chrome iron-ore for which the district is famous, whilst excepting the Wanderer group of mines in the Banded Ironstones, and one or two others, the Mont d'Or granite is the country of all the productive gold mines. Details of the association of the chromite with the serpentine and of the occurrence of the auriferous quartz-reefs in the Mont d'Or granite will be found in the geologist's reports quoted below. Although in descriptions of some of the mines, geological features have been touched upon, notably by Prof. Gregory and Mr. E. P. Mennell, no general acount of the geology of the district has been published hitherto. The latter author's map of the Matabeleland mining districts embraces Selukwe, and shows a belt of schist bounded east and west by granite masses, the whole being traversed by the " picrite " of the Selundi range. It also shows roughly the curved outcrop of the banded ironstone north of Selukwe, and a belt of conglomerite extending up to the Wanderer mine. All the mines shown are placed in the schists. As indicated above, the detailed mapping of the Survey shows that all the quartz-reefs, with two or three exceptions, lie in a granite country-rock, which is, however, separate from the eastern or western masses.

The groups of rocks represented in the district may be classified as follows:—

(11) Alluvium	Igneous	Unfoliated
(10) Dolerite and basalt dykes.		
(9) Norite and serpentine of Selundi Range		
(8) Felsite dykes		
(7) Granite (unfoliated) and quartz-porphyry		
(6) Granite of Mont d'Or		Metamorphic
(5) Impali gneiss		
(4) Serpentine and talc-schist		
(3) Epidorite		
(2) Conglomerate group	Sedimentary	
(1) Banded Ironstone group		

The table attempts to show as far as possible the relative ages of the rocks, the oldest being placed at the foot and the youngest at the top. The relative ages of groups (1) and (2) is not definitely proved, but as the conglomerates of group (2) contain pebbles of banded jasper such as are sometimes interbedded in the Banded Ironstone, the Conglomerate group is considered provisionally to be younger than the Banded Ironstone group. Crush-conglomerates are commonly found in association with the Banded Ironstone, and are not always readily distinguished from the conglomerates of group (2). The epidiorite group (3) consists of metamorphosed basic igneous rocks, and represents the oldest igneous rocks in the district. The group contains other petrological species in addition to the characteristic epidiorite. Large inclusions occur in the Mont d'Or granite and Impali gneiss, but in its normal position this group is found in close relationship to the Banded Ironstone. It apparently consists of a number of sills, though it is possible that extrusive lavas are included. In any case the whole group has been involved in the same set of movements which folded the Banded Ironstones and Conglomerates, and is now found on the side of the Banded Ironstone outcrops opposite to the Conglomerate group. The latter statement simply means that the normal order is :—Epidiorite group, Banded Ironstone, Conglomerate group, but does not declare whether the Epidiorite group is the uppermost or lowest member. If, however, the Conglomerate group is, as suggested above, younger than the Banded Ironstone, it follows that the Epidiorite group must be the lowest member of the series. The fact that the Epidiorites may be seen dipping beneath or lying upon the Banded Ironstone affords no evidence on the point whatever, for the intense folding of the rocks is likely to have caused the inversion of some sections. If, as is appears, the group is mainly intrusive, the intrusions have taken place at or near the base of the Banded Ironstones. The Epidiorite group may be older than the Conglomerate group, although no pebbles of epidiorite are known from the latter. The Serpentine and Talc-schist (group 4) form the outer aureole of the plutonic complex, already described. Mr. Zealley, who carefully studied the mode of occurrence of the chrome-ore in this group and puts forward his results below is of opinion that the chromite is in the main an original segregation, though some of the smaller veins may be due to secondary action. After the intrusion of this ultra-basic magma, the country was flooded by acid intrusions which may be divided into two groups. To one group belong the immense masses of Impali gneiss, which occupy large areas on both east and west sides of the district. In the second group is placed the Mont d'Or granite, which forms the core of the Selukwe plutonic complex. In the western area of the Impali gneiss, Mr. Lightfoot notes that gold has been found in some of the numerous veins of pegmatite or pegmatitic quartz which intersect the gneiss, but it has not up to the present been found in sufficient quantity for profitable working. In the eastern area the occurrence of gold is not yet proved. The Mont d'Or granite, as already remarked, contains numerous auriferous quartz-reefs and to the prospector for gold is, perhaps, the most important rock-mass in the district. The whole mass appears to have been mineralised, and the extensive alteration which affects it, is probably assisted by the decomposition of finely disseminated sulphides. A peculiarity is the number and size of the inclusions of older rocks, such as epidiorite and talc-schist. Some of the reefs lie at the edge of an inclusion, and thus have one wall of altered schist and one of sheared granite. This granite has on the whole suffered less from shearing and dynamite metamorphism generally than the rocks already described. Its relation to the Impali gneiss has not been proved, though it appears to be younger. It is unaffected by the intense shearing which has taken place along the N.N.E.-S.S.W. structural line on its western margin, whilst the Impali gneiss has been greatly sheared. Probably it was intruded about the end of the period of earth-movement which induced the extreme folding and shearing of the rocks in the district. It is a common observation that the formation of ore-veins frequently takes place towards the close of a period of crustal movement. In this respect the Selukwe district appears to be no exception.

The gold ores of the district fall into the following classes :—(a) Pegmatitic quartz veins. (b) Veins with a predominant quartz gangue, accompanied by sulphides. (c) Impregnations of Banded Ironstone. (a) The pegmatitic quartz veins are confined to the western area of granitic gneiss, and have not proved to be of any importance. The gold apparently always occurred free but in small quantity. (b) These veins occur in or immediately around the Mont d'Or granite mass. Mr. Lightfoot describes them as fissure veins, which follow one of three directions, viz. :—N.-S., E.-W., or N.-E.-S.-W. One or more of the following sulphides are usually present :—Iron pyrites, copper pyrites, galena or zincblende, and of these iron pyrites is predominant. The gold commonly occurs in shoots, and as a result of this uneven distribution, two or more mines may be situated on the same fissure. The country rock is sheared granite or altered basic rock occurring as inclusions in the granite. On the vein walls the granite is much cleaved, sericitized, and generally full of carbonates. (c) In the mines situated on the impregnated Banded Ironstone, as a rule only the thick surface zone of cellular oxidized ironstone is worked. It will be seen from Mr. Zealley's description below that the workable ironstones are always traversed by shatter-belts or are seamed by series of quartz-stringers, some of which are auriferous. Some of the ore bodies thus approach a stockwerk in character. On reaching the unoxidized zone, Mr. Zealley found that the sulphide present was iron-pyrites, and that in those pyritous portions carrying the higher gold value the pyrites is disseminated in crystals which are not crushed. From this it may be concluded that the time of introduction of the gold ores was later than the period of intense movement which has so profoundly folded and crumpled the Banded Ironstone, but may have been concomitant with the feebler earth-stresses which mark the end of the period of folding. It is in fact quite likely that the mineralization of the Banded Ironstone took place at the same time as that of the gold veins associated with the Mont d'Or granite; and that the difference in the mode of occurrence of the gold is accounted for by the difference in the character of the rocks. Whilst under comparatively feeble earth-stresses, the granite mass might be expected to open along its joints, the relatively brittle quartz-magnetite rock of the Banded Ironstones, lying between rocks of different rigidity, would frequently shatter. Further, the abundance of iron in the Banded Ironstone can hardly have been a negligible factor, for the influence of iron-bearing solutions on the precipitation of gold is well known. It seems probable, therefore, that the more important gold-ores of the district were formed during the same geological age, viz., the intrusion of the Mont d'Or granite, and near the close of the period of metamorphism. The succeeding igneous rocks are unfoliated, and were intruded after the general folding and shearing movements had ceased. Up to the present no reefs have been found in connection with them. In the western area of the Impali gneiss, one intrusive mass of unfoliated granite has been mapped out. In the eastern area, there appear to be several such masses. Some of these come in contact with the norite of the Selundi range, and Mr. Zealley found small masses and dykes of granite rock in the norite. It is thus possible that some of these later granites are younger than the norite, but as no direct connection was traced with the small masses and dykes in the norite, the evidence is inconclusive. The largest of these later masses is the belt of ultra-basic rock which forms the Selundi range. This is a portion of the extraordinary dyke-like mass, which is known to run across Southern Rhodesia from the Umvukwe Hills in the north, and pass beyond West Nicholson in the south. It is a petrological complex, consisting of norite, serpentine, and other basic rocks. Mr. Zealley notes the occurrence of chromite in it, but apparently not in workable quantity. In one part of the district or another traversing the unfoliated granite as well as the older rocks are dykes of basic rock of which the commonest variety is dolerite. These are the last manifestations of igneous activity in the district. Their age is uncertain. They may belong to the same period as the basic dykes occasionally found in the Coal Measures. The Superficial Deposits consist mainly of residual accumulations. The only stretch of alluvium of any considerable extent is that flanking the Umtebekwe river. This alluvium is auriferous, and some prospecting work has been done on it. Although the river drains a country largely composed of ultra-basic rocks, some of which are known to contain platinum in small quantity, no trace of platinum was found in the alluvium, but any prospector working here should certainly keep a watch for the heavy metallic grey grains of that metal.

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THE JULY RHODESIAN OUTPUT.

A Much Improved Return—Gold Output Third Largest on Record—Total Value of Mineral Output £276,606.

The gold output of Southern Rhodesia for the month of July has been declared at 57,122 ozs., of a total value of £240,514, which is the record return for the year, and is the third largest output that has been declared in the history of the country. The gold output for the previous month was worth £226,867, and for the corresponding month of 1911 £237,517. In addition to gold, there were produced 17,448 ozs. of silver valued at £2,017, 56 tons of lead of a value of £916, 18,445 tons of coal (sales value £6,405), and the large total of 11,986 tons of chrome iron of a value of £26,754. The total value of the mineral output from all sources thus amounts to £276,606, a figure of which the industry in Matabeleland and Mashonaland may well be proud. The following tables set out in full the details of the July return:—

GOLD.

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
Bulawayo District—				
Agincourt (Est. S. Roodt, deceased)	5	542	467.52	1964
Alexandra (J. Stewart)	2	30	9.69	41
Alice and Atlas (R. Barkley)	10	1200	648.65	2724
Aln (W. H. Robinson)	2	28	8.92	37
Antenior (W. J. Lane)	2	120	82.53	347
Do. (tailings)	—	150	19.39	81
Bengali (Hicks and Arbery)	2	318	97.32	409
Do. (tailings)	—	275	17.35	73
Berwick (Rhodesia, Ltd.)	6	260	205.07	861
Do. (tailings)	—	339	77.13	324
Do. (slimes)	—	126	69.16	291
Big Ben (W. E. Hunt)	4	204	192.19	807
Blanket (Forbes Rhod. Synd.)	15	189	60.07	252
Bucks Reef G.M., Ltd.	5	875	348.49	1464
Do. (tailings)	—	522	121.74	511
Burton (W. Holmes)	5	490	93.69	393
Bushtick Mines, Ltd. (tailings)	—	1796	408.19	1714
Do. (slimes)	—	1034	73.55	309
"C" (D. & C. Syndicate)	10 1C	2535	181.12	761
Do. (tailings)	—	2006	209.33	879
Do. (slimes)	—	529	155.58	654
Claremont Mines (Rhod.), Ltd.	20	2748	750.78	3153
Cumberland (H. W. Bearcroft— Concentrates	—	1	13.65	57
De Luxe A.I.W. (J. Gardiner)	5	133	62.49	262
Durban D.B. (Henderson & Toskback) Tailings (April to July)	—	1200	125.70	528
Eagle A (Pearl & Macdonald & Co.)	5	608	169.28	711
Do. (tailings)	—	234	36.41	153
East Gwanda Mines, Ltd., Geelong (Est. W. Hogg, deceased)	15	1267	218.44	917
Ella's (D. Vincent)	5	178	23.23	98
Gertie (T. Agar)	3	80	7.22	30
Glen West (Smith Synd.)	5	170	58.68	246
Intabanenda 2 S (Estate of B. Smallie, deceased)	5	232	63.74	268
Do. (tailings)	—	174	7.96	33
IXL tailings (Forbes Rhod. Synd.)	—	546	23.12	97
Jumpers (A. H. Newton)	5	200	112.13	471
Kalydon (Rose and Kalydor Mine)	5	356	88.15	370
Koba (Koba Syndicate)	5	360	100.14	421
Last Attempt (Jeffery & Felgate)	(2)	5	19.41	82
Li Hang Chang (Comrie & Brice)— (tailings)	—	540	25.48	107
Lonely Reef G.M. Co., Ltd.	15 3T	3817	1060.07	4453
Do. (slimes)	—	3817	2656.25	11156
Matabele 3 (R. M. Nairn)	10	1260	628.86	2641
Do. (tailings)	—	900	73.85	310
May Queen (E. Rockfort)	2	125	118.16	496
Minnie's Luck A (Mrs. C. M. Reid)	5	693	93.07	391
Mystery AIN (W. Souter)	2	192	140.43	590
N'daba (M. Westenberg)	2	11	5.25	22
Nelly (F. D. Roscoe)	2H	1003	159.86	671
Do. (tailings)	—	570	81.82	344
New Eclipse (J. R. Stewart)	5	850	332.41	1396
Do. (tailings)	—	336	39.23	165
New Robin A (E. T. Clayton)	2	140	69.31	291
Do. (tailings)	—	250	33.85	142
Northern Star No. 2 and Kimono— (Peel's R. Syndicate, Ltd.)	10	818	253.37	1064
Do. (tailings)	—	572	30.44	128
Old Nic (Chart. & Gen. E. & F. Co., Limited)	15 4P	1668	578.97	2432
Do. (tailings)	—	1074	126.73	532
Penzance (R. Urquhart)	2	120	34.31	144
Do. (tailings)	—	80	25.04	105
Percival (E. P. Hall)	5	213	55.97	235
Do. (tailings)	—	200	17.30	73
Queen's (Matabele Queen's Co., Ltd.)	10	1500	344.25	1446
Do. (tailings)	—	1500	359.82	1511
Do. (slimes)	—	540	58.59	246
Rainbow D.B.S. (P. Allport)	5	300	80.91	340
Red Rose (C. G. Bancroft)	3	340	55.69	224
Reward (Kay and Cock)	11	90	9.85	41
Riverbank (R. Martindale)	2	50	28.55	120
Romola Nigel G.M. Co., Ltd., (Eastern Queen, Clayton and Lillian	5	664	153.48	645
Do. (tailings)	—	270	20.85	88
St. Patrick (J. Falk)	2	70	9.61	40
Susanna Mines, Ltd. (Susanna, Lady Lina, and Yellow Aster)	8	1046	503.89	2116
Do. (tailings)	—	559	86.05	362
Do. (slimes)	—	618	52.08	219
Svithiod (G. F. A. Nisbeth)	(2)	60	44.06	185
Trump (J. W. Thraves)	5	75	16.90	71
Tuff Nut (King's Synd.)	5	695	437.91	1839
Do. (tailings)	—	325	34.80	146
Bulawayo District Total			14,364.56	60,320
Gwelo District—				
Arizona No. 2 (A. J. Marchant)	5	190	55.63	234
Do. (tailings)	—	350	44.36	186
Arizona No. 2 S (L. R. Evans)	2	107	168.63	708
Beacon Hill 1 (R.Aserman)	2	235	222.87	936
Cinderella (P. Burt)	—	240	22.99	97
Csardas (Wolfshall Syndicate)	10	563	392.59	1649
Do. (tailings)	—	526	106.60	448
Doubtful (J. H. Atherton) June and July	8	78	79.68	335
Emerald (Sphinx Synd.) June and July	2	56	25.03	105
Empire Day (S. Black) June	2	96	33.72	142
Gaika G.M. Co., Ltd.	5 1C	3050	943.19	3961
Do. (tailings)	—	1567	156.32	657
Do. (slimes)	—	1726	96.53	405
Gartley (Mrs. A. J. Grant)	2	8	19.98	84
Glenrosa No. 1 (Mackintosh & Lister)	2	126	37.69	158
Globe and Phoenix G.M. Co., Ltd.	40 10P	6446	8579.57	36034
Do. (concentrates)	—	265	667.84	2805
Do. (slimes, clean-up)	—	—	153.82	646
Gollywog (Albion Synd.) (tailings)	—	560	49.28	207
Gretna Green (M. L. Price)	5	70	37.30	157
Guinea Fowl (Sadler & Holloway)	5	432	80.21	337
Do. (tailings)	—	320	27.02	113
Invulnerable (A. E. West)	5	180	41.38	174
Junction (Stewart and Stack)	5	300	14.80	62
King's (P. S. Warden)	5	324	234.98	987
Lapwing (A. M. Grant)	2	8	5.71	24
Moss (James & Morrisby)	2	30	163.09	685
Nevada (C. C. Hendrie)	2	139	37.16	156
New Dunraven G.M. Ltd.	5	773	182.14	765
Do. (tailings)	—	520	16.27	68
N'Kanya (Tranmer G. Syn., Ltd.) (Mrs. R. O. Dollar)	2	60	25.35	106
North Bonsor (Cornish Syndicate)	15	1528	216.38	909
Do. (tailings)	—	1050	67.24	282
Pompei (Pharos Synd.) June and July	2	227	113.53	477
Pretty Polly (New Rhod. R. Co.,	5	558	133.90	562
Do. (tailings)	—	455	52.56	221
Prince George (J. H. Veasey) (tailings)	—	150	8.77	37
Salome (W. T. Mardon)	(5)	76	38.67	162
Selukwe Columbia G.M., Ltd.	C 3P	3133	1083.12	4549
Do. (tailings)	—	2133	353.97	1486
Do. (slimes)	—	822	70.42	296
Sheba-Bongola (Forbes R. Synd.)	5	310	53.80	226
Do. (tailings)	—	154	123.58	519
South Bonsor (Ideal Synd.)	10	644	63.63	267
Stingo (V. E. Abel), tailings	—	250	1.25	5
Surprise G.M. Co., Ltd. (clean-up of Plant)	—	—	0.87	4
Tebekwe (Tebekwe Synd.)	20	1150	125.54	527
Do. (tailings)	—	840	43.11	181
Wanderer (Selukwe) G. M., Ltd.	4GR	18000	1715.01	7285
Warwolf (Warwolf Synd.)	5	170	54.06	227
Willow (W. C. Spargo)	5	310	62.59	263
Winston (J. Jones) May and June	6	125	22.28	91
Gwelo District Total			17,126.01	72,010
MATABELELAND TOTAL			31,490.57 ozs.	
VALUE			£132,330	

MASHONALAND.

	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
HARTLEY DISTRICT—				
Amarosa (C. H. Wheildon)	5	320	102.26	429
Do. (tailings)	—	200	33.81	142
Baluarte (H. M. Routledge)	2	75	13.62	57
Battlefields (Minaar & McArthur)	2C	1650	428.57	1800
Do. (tailings)	—	1320	158.85	667
Do. (slimes)	—	330		
Blue Rock (Ellsmoor & Goodyer)	2	190	66.18	279
Brilliant (Mabel's Luck Synd.)	5	550	382.95	1608
Do. (tailings)	—	320	73.99	311
Buller (J. Gunn)	5	400	60.59	251
Do. (tailings)	—	360	64.62	271
Do. (tailings)	—	140	10.38	44
Carroll's Favourite (J. P. Carroll and Philip Wiggins, Ltd.)	5	41	8.21	34
Concession Hill and W. Exten. (C. E. Simpson)	5 1C 3P	2668	808.39	3395
Croupier (Croupier Synd.)	2	35	8.76	37
Crown H. (Crown Synd.)	2	180	29.58	124
Do. (tailings)	—	150	26.34	111
Dalny (Philip Wiggins, Ltd.) (slimes)	—	300	25.26	106
Dreadnought (W. E. Masters)	C	279	27.01	113
Duke No. 3 (J. Bertelsen)	2	49	14.50	61
Eiffel Blue & E. Ext. (Willoughbys Con. Co., Ltd.)	10	1355	381.61	1603
Do. (tailings)	—	900	57.31	241
Garnbrook (J. Hardy)	H	380	106.20	446
Giant Mines of Rhodesia, Ltd.	30 2T	11000	4140.96	17565
Ginger (Union (Mash.) Snyd.)	5	413	67.68	284
Glasgow Mines, Ltd.	5	369	127.85	537
Do. (tailings)	—	192	41.62	175
Glencairn No. 3 (Glenrosa Synd.)	4	400	268.43	1127
Do. (tailings)	—	510	38.36	161
Golden Valley (J. Mack)	10	806	162.76	683
Do. (tailings)	—	525	56.83	239
Great Tontine (Yellow Jacket Synd.)	2	253	47.19	198
Guelph (J. Davidson and Mrs. M. Davidson)	2	31	14.15	59
I.X.L. (Heroine G.M. Co., Ltd.)	2	205	57.04	240
Kanyemba (Kanyemba Synd.)	5	300	323.39	1358
Do. (tailings)	—	150	67.19	282
Lapwing (W. Smith)	2	150	41.83	176
Luke (Luke Synd.)	3	150	127.38	535
Mah (McAdams and Harrill), tailings	—	210	33.35	140
Mammoth (J. Collier)	2	270	70.61	297
Masterpiece G.M. Co., Ltd.	5	430	134.52	565
Do. (tailings)	—	360	27.29	115
Moliere (H. Moser)	5	630	119.24	501
Do. (tailings)	—	960	39.12	164
New Gold Bug (Gilday & O'Conner) slags	—	—	6.45	27
North Star (Try Again Synd.)	5	641	64.18	270
Oleander G.M. Co., Ltd. (Oleander and Arlandzer)	3	254	134.23	561
Do. (tailings)	—	239	60.38	254
Do. ((slimes)	—	167		
Owl (A. Rolfe)	10	1420	485.45	2039
Do. (tailings)	--	928	193.37	812
Pat's Luck (C. Tallon)	(5)	35	8.78	37
Pickstone, 1E. (S. L. Synd.)	4	504	873.28	3668
Do. (tailings)	—	330	196.02	823
Progressive E & D (R. R. Aitkin)	2	75	47.48	199
Do. (tailings)	—	60	19.97	84
Rouge 1 N (S. Rhod. M. Synd. Ltd.) (tailings)	—	—	0.80	3
Seigneury (Central Min. & Invest. Corporation, Ltd., and N. A. Arnold)	5	103	127.61	536
Shepherds (Phoenician Synd.)	5	580	279.22	1173
Do. (tailings)	—	550	191.10	802
Sid (Sebakwe & Dist. Mines, Ltd.)	5	693	346.65	1456
Three Cheers No. 1 (F. J. Nalty)— Tailings	—	930	58.85	235
Unknown (Brooks & Martin)	2	225	51.20	215
Warthog (C. Tallon)	5	150	38.59	162
Do. (tailings)	—	160	9.18	39
Washington (I. J. Minaar)	5	460	393.30	1652
Do. (tailings)	—	390	30.24	127
Whistlecock, 1 W (T. McDowell)	2	183	48.85	205
Do. (tailings)	--	110	38.62	162
White Rose (J. Mack)	(10)	250	347.92	1461
Hartley District Total			12,947.80	54,539
VICTORIA DISTRICT—				
Etna (W. A. Schielke) (clean-up)	5	20	9.90	42
Victoria total			9.90	42

	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
UMTALI DISTRICT—				
Cairn Dhu 2W (Parseval Synd.)	5	328	27.17	114
Golden Quarry (T. Brown)	3	18	8.06	34
Kent (Sussex Synd.)	5	640	35.03	147
Do. (tailings)	—	410	26.90	113
Liverpool (R. G. Snodgrass)	5	690	100.46	422
Do. (tailings)	—	260	57.75	243
Liverpool A (Umtali Waterfall Synd.)	(10)	240	22.45	94
Mecca (Umtali Waterfall Synd.)	10	550	113.60	477
Do. (tailings)	—	155	25.06	105
Do. (slimes)	—	275	10.92	46
Montezuma No. 2 (Odzi Trib. Synd.)	2	50	17.91	75
Palmyra (J. de G. Birch)	3	50	12.73	53
Penhalonga Mines, Ltd.	50	6900	649.89	2757
Do. (Concentrates)	—	150	588.93	2444
Pilgrim 2E (J. Meikle)	5	468	197.06	828
Rezende Mines, Ltd.	35	4400	1149.02	4875
Do. (concentrates)	—	30	102.42	435
Do. (tailings)	—	2967	380.11	1613
Do. (other sources)	—	—	17.85	76
Rezende 1 W. A. (Imbeza Synd.)	10	3587	310.23	1216
Do. (concentrates	—	4	28.67	119
Umtali (Umtali Waterfall Synd.)	(10)	940	202.13	849
Do. (tailings)	—	341	60.94	256
Do. (slimes)	—	550	13.05	181
Umtali Total			4,188.34	17,672
LOMAGUNDI DISTRICT—				
Alluvial (A. Coleman)	—	—	25.10	105
Eldorado Banket G.M. Co., Ltd.	2C 8P 20	7903	3781.26	16036
Do. (tailings)	—	7892	981.25	4161
Gold Cliff A (G. Frame) pannings	—	—	5.60	24
Linnett (A. R. Morkel)	2	293	157.26	661
Lone Hill 1 (Moll & Platt)	2	56	18.58	78
Tripolitania (P. Presot)	D	14	10.80	45
Lomagundi Total			4,979.85	21,110
MAZOE DISTRICT—				
Commonwealth G.M. Co., Ltd.	(30)	400	68.00	288
Do. (tailings)	—	256	42.00	179
Do. (slimes)	—	144	10.00	42
Goth B (Goth Synd.)	2	64	31.54	132
Hay G.M. Co., Ltd.	10 1T	2764	285.07	1209
Do. (tailings)	—	3029	415.38	1761
Honest (G. Brown)	3	97	30.94	130
Jumbo G.M. Co., Ltd.	30	3000	698.57	2969
Do. (tailings)	—	1914	437.00	1857
Do. (slimes)	—	1056	111.53	474
Mickey (B. G. Byerley)	2	158	115.80	486
Mossyface (J. P. Jooste)	(5)	109	65.92	277
Night Adder (Night Adder Synd.)	2	20	12.99	55
Thornhill (Oceola G.M. Co., Ltd.)	5	782	386.61	1624
Umkulu D.B. 1W (Llahsram Synd.)	2	125	76.67	322
Mazoe Total			2,788.05	11,806
SALISBURY DISTRICT—				
Abercorn (J. Seton Rogers) tailings	—	300	18.96	80
Gladstone A (L. Chiappini) (tailings)	—	700	37.28	156
Inyagne 3 (P. L. Peters)	2	104	79.42	334
Mont d'Or (Claxton and Bussell)	2	140	198.28	833
Old Loyalty (Shamva Ilex G.M. Co., Ltd.)	5	253	174.01	731
Do. (tailings)	—	200	58.24	244
Perseverance (Byerley & Crampton)	2	68	37.89	159
Radnor 1 (Jones and Wyllie)	2	119	88.03	370
Virgin (J. Vorwerk)	D	1	25.81	108
Salisbury Total			717.92	3,015

MASHONALAND TOTAL	25,631.86 ozs.
VALUE	£108,184.
GRAND TOTAL	57,122.43 ozs.
VALUE	£240,514.

SUMMARY.

	Ozs.	Value.
Silver	17,147.73 ozs.	£2,017
Chrome Iron	11,986.00 tons	26,754
Lead	55.74 tons	916
Coal	18,445.00 ,, (sales)	6,405

TOTAL VALUE JULY OUTPUT £276,606

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Rietfontein Series.

To the Editor, *South African Mining Journal.*

Sir,—I see, according to Mr. Olver's statement, that Rietfontein reef is a portion of the Main reef; that is where he is making a great mistake. Most of the geologists admit that our Rand formation was laid down by the action of water. I have traced the northern series for 45 miles—Rietfontein lies in that series all the way. I made an offer to Messrs. Neumann and Co. five years ago to expose the Rietfontein reef in the Alexandra Estate north of Krugersdorp, but they did not do anything in the matter. I exposed the Rietfontein reef in the Troyeville township nineteen years ago, 9 inches thick, assaying 13 or 14 dwts. I can show three other parts where I can get from 12 dwts. to 1 oz. According to Mr. Olver's views, he does not believe that the reef extends further than the Rietfontein mines, but that it is a portion of the Main reef, and the Main reef has been faulted north. That is wrong, and misleading to the general public; no such faulting could take place. You cannot lift one reef over another. With regard to the red magnetic shale, Mr. Olver mentions it is in Kensington, on the north side of the tramline. There is a dark striped shale on the north side of the red shale, very magnetic, resembling the Hospital Hill shale; a hundred feet south of that there is a red shale bed 30 feet wide. There is another red shale bed south of Jeppes Hill. All these beds can be seen 20 miles to the east, but the first-mentioned shale, resembling the Hospital Hill shale, runs north of Jeppes Hill range; it can be seen to the west of the Geldenhuis Mill, overlying the Government reef, and on Barrett's Rietfontein, and a portion of it carries gold. It can be seen south of the Rietfontein gold mine. Mr. Olver classes Jeppes Hill quartzite with Hospital Hill quartzite; it is an entirely different class of rock. From the outcrop of the reef on the Rietfontein mine to the Main Reef outcrop is over three miles, and at Troyeville the outcrop is 3,200 feet from the Main Reef outcrop at the Wolhuter gold mine. There has been a great pressure at Troyeville; the formation is tilted over and dipping north.—Yours, etc.,

P. S. WOOD.

28, Wilhelmina Street, Troyeville.

The Dust Problem Underground.

To the Editor, *South African Mining Journal.*

Sir,—Much has been spoken and written on the above subject, and no doubt a considerable amount of good has resulted. Yet I venture to think that we are still a long way off having solved the problem. The dry hole problem has been overcome; we are now drilling dry holes under water pressure, and that method, in my opinion, is undoubtedly superior to any mechanical contrivance yet invented for catching the dust. We also spray faces of stopes and headings, and damp all dry rock. So far so good, but what about blasting time, at end of shifts? Nothing, so far as I am aware, has been done to prevent the dust from being carried along the main air currents throughout the whole mine, depositing itself along drives or keeping in suspension, according to the size and weight of the particles. I personally know a score or more of trammers only who have been ordered out of the mines by the doctor. Some of those men had only been a short time underground. That goes to show that the drives, which, as a rule, look quite clear and free from dust, are in reality teeming with the finer particles of dust in suspension.

I will now try and point out a practical way by which this dust can be confined to its source, so to speak. The great principle involved is to get control of the air currents in the mine, more especially currents travelling up through stopes, and then to intercept them as close as possible at the different points from whence the dust arises. The dust we have to contend with arises from all sources where blasting takes place, but for practical purposes we may confine ourselves to headings, rises, winzes, and stopes. It is quite an easy matter, for instance, to confine the dust to headings, winzes, and rises. Your water service main is, of course, continued right along the drive close to your heading, if you place a stand pipe on your main, say, about 100 feet from the face so that it is safe from blasting, a bend with a rose screwed on to end of standpipe completes the job. Care, however, must be taken that the angle of discharge from the rose is sufficiently large to take in all space between hanging foot and sides. Then, as soon as the miner has lighted his fuses and turned on his air cock, opened valve on standpipe, it is impossible for any dust to pass by the rose. The same method holds good at the top of a winze and at the foot of a rise. When the miner goes back he can easily lay the dust from the standpipe to the face; the dust is, therefore, stopped at its source.

So far it has been an easy matter, but we now come to stopes, and here, I am afraid, it will mean a considerable outlay in money before we will be able to confine the dust to the stope; however, the first thing we will have to do is to make the current travel along the face only, and not all over the stope. When once we have made the current travel up along the face of the stope, emerging through a single opening into the drive, our task is nearly done. We place our standpipe at the opening, and confine the dust to the stope. In addition, I would recommend a water column run the length of the stope, that is, to its lowest part parallel with the face, and about 30 or 40 feet from it, to be safe from blasting; three or four offsets along column is desirable, so the miner can shift his hose along down the face as he makes things secure. To be able to gain the above success we must, of course, have our stopes covered in from the drives, and that is, of course, where the expenses will come in, but I believe it can be done; at any rate, it is worth a trial, when we consider the immense benefit to be gained.—I am, etc.,

W. BERTHELSON.

East Rand,
August 28, 1912.

Do the Mine Change Houses Contribute Towards Disease and Illness?

To the Editor, *South African Mining Journal.*

Sir,—The title of this letter will no doubt cause many remarks as to the answer thereon, especially at the present moment when we are faced with the ravages of the smallpox scare. The reply will be no doubt by some in the affirmative and by others in several ways. I therefore intend to lay briefly a few facts before those responsible for these houses of disease and filth. My contention on the above subject is that a lot of illness and disease could be traced back to, and furthermore is caused directly from, these places, through the filthy state of same and mostly on many of the older mines where the old " ramshackle " still exists: I am positive that, if the accumulation of filth in such places were analysed or put under a microscope, one would be positively shocked as to the result thereof (by-the-bye, I had occasion to make test for myself some time back), and after all go into any change house you wish to (excepting always the newer mines with up-to-date accommodation), you will then see for yourself the state of affairs existing. Take, for example: When going on shift in the morning (especially winter) one is frozen to the core through no heating at that hour, but by midday all steam pipes are in full swing, which makes this place unendurable and more like a furnace; it is then, naturally, not needed, as the heat of the sun alone during the day radiates enough warmth to make the place comfortable, and yet when you come to put on your underground clothes in the morning you will find that in many cases they are still damp, and that alone shows that also during the night time the steam is turned off, otherwise the clothing would have been perfectly dry by then. The result of this again is detrimental to one's health. No one ever attempts to see that these places, or change houses, are well constructed or looked after (usually a native is wholly in charge), and that is those responsible, as "they" generally have cosy corners well fitted out and every convenience, but the miner must be contented with this edifice. These are absolutely facts, and I can personally vouch for what I have remarked. Why, some of the richest mines on the Rand have change houses which are a disgrace to the industry. Furthermore, the old wooden change boxes of about twenty years ago still exist on some mines with dirt and vermin enough to make the hair stand on edge, and as to the bathing accommodation, well, it is the limit. For verification ask the miners or underground men in general how often these baths are used by them and why they decline to use them. My presumption is that if these were used by all in their present state the "mine hospitals" would be full of skin disease patients and other ailments, caused from their use. If these houses taken right along the reef were visited or inspected by those Government officials responsible for the control of the mines, they would after second thoughts (perhaps first thoughts in many cases) and under these circumstances alone be condemned by them, and I would not mind wagering that 75 per cent. of these germ-collecting structures would be condemned by any medical officer. It is a disgrace, to say the least of it, and yet no one has come forward to better the conditions now existing. Why, the niggers, in comparison, are treated better in that respect; and why? Because the law lays down certain regulations, and they are undoubtedly enforced nowadays; that is, since we have so many tropical natives on our mines. Where do we come in then? One always hears at annual company meetings what certain mines are doing for their employees. Yes, that's true. The up-to-date mines are doing everything that is possible and at the same time trying to make things comfortable, but what about the older ones? There remains yet a lot to be done and before long, too; and that the change houses in general are anything but Parktown quality of latest construction cannot be disputed, and the fact remains. On a certain mine on the East Rand there, naturally, exists a change house, but just try and get a common garden wash when coming off shift from underground and the result may be a severe scalding if you are not careful. Now, there exists washing accommodation, but, strange to say, the only water is "steam" from an exhaust pipe coming from the engine house; that is, condensed water as black as the ace of spades, and naturally at its highest temperature, but no cold water laid on to deaden or cool the hot water. Such are the conditions one is faced with, and with what result if you happen in error to turn the tap on whilst in a bath! Rather a pretty hot experience it would be; and with this daily goings on not a word is said by anyone forced to use this place to those responsible. Are you, then, surprised that men will not use such places and rather go off in their wet clothes to their rooms and change there, with the result that sooner or later one is laid up with a severe cold, rheumatism, or some other ailment, and through the negligence of those responsible for their employees. Improvements are made everywhere, but I am sorry to say the change houses have remained in most cases as they were of prehistoric age of years gone by. Taking all this into account, which is little enough, my contention therefore is that a lot of sickness, disease and other ailments could be traced back to these badly-kept and filthy houses. It is a serious matter, as any medical man would be able to prove, and furthermore by taking alone the statistics of the number of skin disease persons treated from every mine, and whence they originated. We all do not live on the mines and naturally are compelled to change at such places, otherwise one could go to one's quarters and do the needy there, but as a good percentage of men live off the property the chances are that these men are the first to show signs of illness, and especially during the winter time. Any doctor can verify this statement. In my opinion there are a goodly number of these structures that want to be razed to the ground or burnt down after their many years of use by all sorts of men with contagious diseases, leaving a sort of legacy to others that they may also share the fate of themselves. Through the accumulation of filth and dirt of years it is only natural that disease of some sort hovers over these places. I trust my remarks on above subject will be taken up as a caution against sickness or epidemic, at the same time forewarning those responsible to remedy the evil.—Yours, etc.,

M. R.

Johannesburg, 21st August, 1912.

Geological Truth Tablets.

To the Editor. *South African Mining Journal.*

Sir,—We cannot point a finger to any spot on a map of the Transvaal which is not auriferous, diamondiferous, cupiferous, stanniferous, argentiferous, carboniferous, or some other kind of "iferous.". The gold, like the coal of this country, is inexhaustible, and beyond the ken of those geologists who have the nerve, every now and then, to place a limit to them. Before many years are over South Africa will put out as much tin to the square inch as the Rand was once credited with brains to the same measurement. Our coal measure age is a hinderance to the prospector, as it hides thousands of square miles of gold and diamondiferous country. We have the three coal-bearing horizons in the carboniferous age, but geologists in their haste cram them all into one, and make it climb up hill, poor thing, all the way from Komati Port—vide the Geological Survey Report. In certain districts Nature has scattered diamonds broadcast, in a foot or two of volcanic mud, etc., for the poor of this country to seek and find. The Lydenburg goldfields are capable of producing as much of the precious metal as the Witwatersrand, but neither the capitalists nor the Government will throw the fields open to the public.—Why? Black Reef series is fast proving itself to be a greater gold producer than it is possible for Main Reef series, or any other series to be. Main Reef series is an overrated series, and although I have from time to time discovered miles of it in the outlying districts, I can only go bail for a few miles here and there on surface showings. The majority of geologists do not know Main Reef series from Black Reef series, otherwise they could not possibly mistake the latter for the former on Randfontein, or on the East Rand either. There is no such thing as the Witpoortje-break! The fault is the fault of man, and Nature had no hand in it, except to spoof him in her own little playful way. It is our fault if we think we see faults where there are no faults, as they are certain to lead to faulty stratigraphy, and make confusion worse confounded—which is being rapidly accomplished. To talk of "the" Transvaal system is absurd, as there are five distinct geological systems—or ages—in the Transvaal, which I have dwelt upon for years. The Intinguie and Insusi beds of Natal are the lower beds of the Lydenburg age, of which the Denny Dalton conglomerates are the upper, as at the Kantoor, Pennyfather of Zoutpansberg, etc., etc., etc. As far as I have seen of Natal, there is nothing to prevent its becoming a payable goldfield—given railway facilities—in spite of the thousands lately spent to condemn it as such. Scientists, with open minds, anxious to reckon the age of the world, had better come to South Africa to complete their education; we can show them something more than fossils on which to base their conclusions.—I am, etc.,

SCOTT ALEXANDER.

Johannesburg, August 26th.

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THE POSITION OF THE CROWN MINES, LTD.

Important Speech by the Chairman at the Special Meeting.

SPEAKING at the special meeting of the Crown Mines, Ltd., yesterday, Mr. Samuel Evans said, *inter alia*:—Between July 1st, 1909, and the end of June last we spent on capital account and advance development a total sum of £1,546,103, excluding payments for property and for mining rights. A portion of this expenditure was met out of cash in hand at the time of the amalgamation and out of excess profits since; but, after allowing for the half-yearly dividend, we had a cash liability on June 30th last of £1,078,040. There was spent in July on capital account and advance development £28,225, and there remained to be spent under these heads at the beginning of this month about £114,000, which would bring the total cash liability up to £1,220,265, of which £308,556 is on account of excess development. The proposed debenture issue will, it is estimated, liquidate £925,000 of the debt, and the balance of £295,265 will be gradually paid off out of profits in excess of the dividend declaration. I should add that I have not taken into account the value of sundry assets, such as stores, payments in advance, and shares amounting on June 30th to £140,566, which, if deducted, would reduce the amount to be provided out of profits to £154,699. I may also mention that it is unlikely that we shall at any time have any actual debt beyond the debentures, excepting, possibly, a small amount for a few weeks. The main reason for this is that we have always at least one month's profits in hand, and that the profits tax only becomes payable on the last day of February in each year. Although we had on August 7th—immediately after the payment of the half-yearly dividend—a cash liability of £1,007,829 (after paying for stores, sundry assets, etc., as stated), our actual indebtedness to the Rand Mines and the Central Mining and Investment Corporation only amounted to approximately £850,000. Now, I will attempt to explain to you briefly what has been accomplished with the large amount of money that has been devoted to capital expenditure in the past three years. And to enable you to follow what I have to say in this connection I have here a number of plans. In the first place, we have increased our payable ore reserves from four million to over ten million tons, the recoverable gold contents of which have a value of approximately £15,000,000; and we have in readiness a sufficient number of stope faces and the necessary ways and means to enable our reduction plants to be fed to their full capacity with ore of the average grade of the reserves. We have improved and augmented the housing accommodation of our employees, white and black; centralised and enlarged our offices and workshops; electrified nearly all our power plants; provided new and up-to-date sorting and crushing arrangements with more than treble the capacity of the old ones; and increased the size of our reduction plants from less than 150,000 to 230,000 tons per month, with a commensurate expansion of the entire equipment on the surface and underground. But of the things done in the past three years not the least important is this: We have placed ourselves in a position to work the whole of the property as one mine, and not as a collection of mines under one management. That is the distinctive feature of the policy we have pursued. The fusion of the separate mines and of the different installations into one organisation is complete, both underground and on the surface, and we should reap all the advantages that are to be gained from large scale production by one concern. Our costs should be lower than those of any other company on the Rand mining reefs of approximately the same character and from about the same depths.

You will observe that the South Rand dyke, which runs through the property from east to west, divides our mining ground into two sections. Roughly, about one-third of our intact claims are in the northern portion and two-thirds in the southern. In his report of January 1st, 1909, Mr. Webber estimated that there were 36,000,000 tons of payable ore in the northern area. We have reason to believe that that estimate, like most of Mr. Webber's estimates, was conservative. We have since mined from this area close on five and a half million tons, of which about four million tons came from the ore reserves, and I do not think that I am making a rash statement when I say that there are probably still 36,000,000 tons of payable ore in our property north of the South Rand dyke. Now, our underground organisation is such that the whole of that tonnage is within reach of our two main shafts, No. 5 and No. 7, and the bulk of it can be handled through either shaft. This is rendered possible by main haulage levels, of which the most important is the 13th. Eventually this level will have a length of about three miles, and already rather more than two-thirds of the distance is completed and in working order. It is 15 feet wide and 9 feet high, and in it is installed an electric haulage system by means of which ore from any point can be sent to either shaft in trains, each taking 80 tons per trip. This level and the South Rand shaft came into operation on the 12th of this month, and as far as it is possible to judge, the whole arrangement promises to be well up to our anticipations. There are, of course, many details yet to be perfected, and there have been numerous small hitches and delays, but nothing serious, and nothing beyond what is inevitable, having regard to the complexity and magnitude of the undertaking. It will, I have no doubt, take two or three months to get on to a settled and smooth running basis, and during this transition stage costs will be unduly high, and there will probably be a certain loss of tonnage. This month the yield per ton will also be below the normal grade of the reserves, as the tonnage lost is from the eastern section; whilst an undue proportion of ore has been mined from the poorer areas. I would ask shareholders to bear these considerations in mind, and not be in any way disappointed should the results of this and the next month or two not be up to the average profits of recent months. Up to the 27th the tonnage handled this month compares with previous results thus:—August 1st to 27th: Tons mined per day 5,405, tons milled per day 5,037; July, tons mined per day 6,084, tons milled per day 5,355; January to June, tons mined per day 5,880, tons milled per day 5,126. I may say that so far the change over from the old system to the new has involved a considerably smaller loss of tonnage than we had expected. I have on former occasions given an account of our surface arrangements, and the extent to which our plants have been reconstructed and enlarged. You will note from the plans that we have eleven shafts on the property. We have ceased to use all but four for supplying ore to the mills, and shortly all the ore will be hauled through two shafts, Nos. 5 and 7, and this will be done on one shift. The capacity of these two shafts and the underground arrangements are such that should it be necessary, owing to accident or for other reason, to tem-

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WRIGHT, BOAG & CO., Johannesburg.

Patented Transvaal, Gt. Britain, Australia, United States of America, &c.

porarily stop work in one of the shafts, the ore required for the reduction plants can be hauled through the other shaft. In addition to the Bonanza Mill (10,000 tons) we have three large reduction plants with the following total monthly capacity:—"A" mill (Crown Deep), 90,000 tons; "B" mill (Langlaagte Deep), 55,000 tons; "C" mill (Crown Reef-South Rand), 75,000 tons; total, 220,000 tons.

The figures I am giving now differ from those mentioned at the annual meeting mainly because we have found by experience that the capacity of the new installations had been under-estimated. The three mills are connected with No. 5 and No. 7 shafts by a railway system. At each of the shafts there is a large sorting and crushing station, and from these stations the ore is taken in train loads to one or other of the three large mills. I would direct your particular attention to the elasticity of the whole system; ore mined anywhere within reach of the 13th level can be taken up either of the two shafts and sent to any one of the three large mills. A point which, I am sure, shareholders would like me to deal with to-day is that of the probable finality or otherwise of the capital expenditure. The question that will no doubt occur to you is this: To what extent are our future profits likely to be encroached upon for the purpose of providing for further capital expenditure? I will try and answer that question. The arrangement we have met to consider to-day provides for a further expenditure on account of capital of about £111,000. The chief items covered by that figure are: The completion of the electrification of the plant; pumps on and below the 13th level; underground winders for No. 7 shaft; and the cutting of an ore bin on the 19th level in the South Rand shaft. We shall also require a third hauling engine at No. 5 shaft. This has not been provided for, but I am in hopes that the economies on the existing votes will suffice for that purpose. Another item of capital expenditure which we may have to face in the near future is that of water-borne sewage to replace the existing pail system. In any case, the excess on account of the two votes mentioned will be under £35,000. The position therefore is this:—As far as it is possible to see at present, after an expenditure of about £150,000 we shall have completed all the capital expenditure work necessary to enable the whole of the claims north of the South Rand dyke to be worked out. As I have said, they are estimated to include about 36,000,000 tons of payable ore. Further, having sunk the South Rand shaft to a depth of 1,400 feet below the reef series, or to a total depth altogether of 3,434 feet, we have made it possible for the ore in the area south of the dyke also to be economically handled through the South Rand shaft and treated with our existing plants. Many years hence it may be necessary to sink one or two shafts in that area, but these shafts need only be for ventilation purposes, as the whole of the rock from the southern ground can be handled through the South Rand and No. 7 shafts and by the equipment already provided. This will involve a large saving in future capital expenditure—a saving which was not contemplated at the time of the amalgamation. It may appear on the face of it that the policy we have pursued has somewhat penalised existing shareholders in order to create a condition of affairs from which future shareholders will benefit. That is really not the case. The course adopted was not only the best from the point of view of opening up the ground below the South Rand dyke, but it was also the quickest and most economical method of developing the area which lies between the 13th level and the South Rand dyke. An impartial expert looking at the position of our mine with its organisation and its equipment to-day would, I am confident, be forced to the conclusion that we have no reason whatever to regret the policy and the lay-out decided upon in 1909. Indeed, the experience of the past three years has enormously strengthened the case for the amalgamation. I admit that we under-estimated the magnitude of the obstacles that we have had to overcome, but we also under-estimated the value of the property and the benefits that will accrue from the fusion. At the beginning of 1909 we believed that we would be able to maintain the dividend at 130 per cent. and in all probability that forecast would have been fulfilled had it not been for the serious loss of tonnage imposed on us through the shortage of labour. Also, our capital expenditure has far exceeded our estimates, but, on the other hand, our position generally is stronger and more promising than even the most sanguine of us had ventured to hope for at the outset. Taking everything into account, I consider that all concerned have every reason to be satisfied with the amalgamation and to be proud of what has been accomplished at the mine in the past three years. Only those who are in close touch with the work can realise the enormous difficulties involved in keeping up the output and the profits at as high a level as we have done with the labour force at our disposal, whilst at the same time reconstructing and enlarging the plants and completely re-organising the whole system of handling the ore both underground and on the surface. Henceforth our profits will depend mainly on the labour supply. That is the governing factor. In my speech at the annual meeting on the 23rd of May last, I referred at some length to the profits earned by this company and its constituent companies in the past few years, and I gave the average monthly profits up to the end of April last. The results since have been:—

	Tons Milled.	Total Profit.	Profit per Ton
May	163,400	112,129	13/8·6
June	161,200	108,877	13/6·1
July	166,000	118,825	14/3·8
Monthly averages	163,533	113,277	13/10·2

As I have shown, the company has a crushing capacity of 230,000 tons per month, or over 66,000 tons more than the average treated in the past three months. In my opinion it is reasonable to assume that had the labour supply been sufficient to enable the company to utilise, say, half the surplus plant the average monthly profit would have been increased by about £23,000, or brought up to an average of about £136,000 per month. I am satisfied that our grade and our costs will not disappoint those who relied on the estimates framed at the beginning of 1909, provided labour is forthcoming, and I would add that I know of no company that is likely to benefit more than the Crown Mines from the new labour organisation which comes into existence on the 1st October. I do not intend to occupy much of your time in dealing with the proposed debenture issue. I gave an outline of the scheme at the annual meeting, and it has also been explained to you very fully by circular. Briefly, it is this:—(1) To issue £1,000,000 first mortgage debentures carrying interest at five per cent. per annum and redeemable at £103 per cent. as to £935,000 by eleven annual drawings each of £85,000, commencing on the 1st January, 1915, and as to the balance on the 1st January, 1926. (2) The company reserves the right to purchase the whole or any part of the debentures in the market or otherwise at any time at or below £103 per cent. (plus accrued interest) or on giving three months 'notice to redeem the whole or any part by drawings at £105 per cent. (3) The debentures are to be offered to the public at £97½ per cent., preference in the allotment being reserved to the shareholders of this company and of the Rand Mines, Limited. Applicants are at liberty to apply for such amount of debentures as they may desire, irrespective of the number of shares (if any) held. (4) The issue at 97½ per cent. is guaranteed by the Central Mining and Investment Corporation, Limited, and the Rand Mines, Limited, for a commission of three per cent. on the nominal value of the issue. If the scheme is adopted, circulars enclosing a copy of the prospectus together with application form will be despatched to shareholders of this company and the Rand Mines, Limited, on the 3rd of next month. The subscription list will be opened on the 9th and closed on or before the 13th of September, by which date, as far as South Africa is concerned, applications accompanied by remittance for the deposit of 10 per cent. of the nominal amount of debentures applied for must reach the National Bank of South Africa, Limited, Simmonds Street, Johannesburg. In conclusion, I wish to say that the whole position has been most carefully considered by your directors and we are of opinion that the proposal we are now submitting to you is a fair and reasonable one and provides the best method possible under the circumstances for placing our finances on a sound and permanent basis.

UNION MINING STATISTICS FOR JULY.

Gold, Silver and Coal Production—Development Returns—Accidents and Explosive Figures.

The following are the usual monthly returns, compiled and issued by the Government Mining Engineer's Department, of the prinicpal statistics relating to the mineral production of the Transvaal and the Union.

Total value of mineral output, gold, silver coal, and other metals and minerals, excluding diamonds, for July is £3,629,685.

THE GOLD PRODUCTION.

For July the Government returns of the gold output of the Transvaal record a total of 766,380.717 ozs. of fine gold of a value of £3,255,377, the contribution from other Provinces being 176.4 ozs., value £749. It may be repeated for the benefit of students of the mining industry that the Government returns reflect gold actually produced during the month, and an explanation of some of the difference may be found in gold won not having been accounted for in the returns furnished by the companies to the Chamber of Mines in the month in which it was produced. The Government's return for the Witwatersrand is 735,915.738 ozs., value £3,126,098, against the Chamber's declaration of 735,911 ozs. value £3,126,077, which is less by 5 ozs., value £21, than the Government figures. For the outside districts the Government analysis gives 30,435.009 ozs., value £129,279, against the Chamber's figures of 30,397 ozs., value £129,121; the difference in this case being 38 ozs., value £158, more than the figures shown by the Chamber.

	Ozs.	Value. £
Witwatersrand...	735,915.738	3,126,098
Outside districts—		
Heidelberg...	7,085.000	30,095
Klerksdorp	2,718.222	11,546
Ottoshoop	99.920	425
Barberton	7,110.087	30,201
Pilgrim's Rest	12,783.330	34,300
Pietersburg	638.450	2,712
	766,380.747	3,255,377
Cape	3.000	13
Natal	173.400	736
	766,557.147	3,356,126

In the detail of sorting the system of tabulation sets out that the producing mines on the Rand sorted out during July 13.16 per cent. of the tonnage mined as against 12.73 for June, 13.18 for May, 12.87 for April, 12.88 for March, 10.03 for February and 12.76 for January. The tonnage milled on the Rand amounted to 2,159,695 tons and for the whole of the Transvaal 2,234,000.

ROCK DRILLS.

The average number of machine drills in use in the gold mines during each month for the past thirteen months was :—

1911—	
July	4,329
August	4,412
September	4,417
October	4,589
November	4,653
December	4,671
1912—	
January	4,791
February	4,761
March	4,689
April	4,665
May	4,951
June	5,322
July	5,505

of which 5,421 were on the Rand, 49 at Heidelberg, 13 at Klerksdorp and 19 at Barberton.

DEVELOPMENT.

For all districts the figures for ore handled and treated during July are :—

	Rock Hoisted. Tons.	Rock Milled. Tons.
Witwatersrand	2,612,084	2,159,695
Heidelberg	24,282	18,652
Klerksdorp	13,738	10,176
Ottoshoop	659	659
Barberton	24,609	18,088
Pilgrim's Rest	27,738	23,877
Pietersburg	3,794	2,853
	2,577,420	2,234,000

The number of feet driven on development on main drives and crosscuts was :—On the Rand 11,012, and in outside districts 10,270. On the main shaft sinking on the Rand a total of 3,922 feet in depth was attained, and in outside districts 97 feet. Other development on the Rand accounted for 25,139 feet, and in outside districts 1,501 feet.

FINE SILVER DECLARED.

The returns of fine silver produced begin from the commencement of the statistical year, July 1, 1902. The declared weight and value are appended :—

	Ounces Fine Silver.	Value. £
Statistical year, 1902-3	280,997.219	29,215
Statistical year, 1903-4	406,676.944	45,111
Statistical year, 1904-5	476,085.975	54,221
Statistical year, 1905-6	574,485.878	70,704
Statistical year, 1906-7	690,731.853	92,874
Statistical year, 1908-9	798,316.556	84,686
Statistical year, 1909-10	801,657.721	85,807
June-December, 1910		55,650
Year 1911		98,507

1912—	£
January	8,735
February	8,321
March	9,291
April	9,525
May	9,619
June	9,536
July	9,668

COAL PRODUCTION.

The number of mines producing coal in the Transvaal is returned at 30. The quantity sold was 408,656 tons for the month, which shows an increase of 32,788 tons as compared with the previous month. The total value of the coal at the pit's mouth is given at £91,589, which is an increase of £9,100.

The details of the production for June are :

	No. of Collieries.	Tons sold.	Value. £	Value per ton. s.	d.
Springs	5	52,820	14,203	5	4.3
Middelburg	15	305,745	67,947	4	5.34
Other districts	10	50,091	9,439	3	9.22
	30	408,656	91,589	4	5.79

The percentage of waste sorted out was 14.70.

UNION RETURNS.

	Coll.	Tons sold.	Value. £	Value per Ton. s.	d.
Cape	8	7,137	4,086	11	5.4
Orange Free State .:.	5	47,677	12,743	5	4.15
Natal	19	241,018	67,769	5	7.48
Transvaal	30	408,656	91,689	4	5.79
Totals...	62	704,488	176,187		

COPPER.

The output of marketable produce for July was :—

	Tons.	Pure metal per cent.	Tons.	Value shipped.
Transvaal	239.42	81.5	116.333	£3,861
Cape	1,064.00	50.61	4,319.000	142,215
	1,303.42		4,435.333	146,076

TIN.

The marketable output of tin for July was :—

	Tons.	Pure metal per cent.	Tons.	Value shipped.
Transvaal	290.49	67.26		£29,488

OTHER MINERALS.

Minerals other than gold, coal, copper and tine for July were :—

TRANSVAAL.

Mineral.	Tons.	Value.
Graphite	3.006	£94
Magnesite	77.0	226
Lime	5,482.0	8,397
Flint	110.0	756
Miscellaneous (mica, corundum)	36.0	217
	Ozs.	
Silver in gold bullion...	81,189.07	9,668

UNION OF SOUTH AFRICA.

Minerals.	Tons.	Value.
Asbestos	106.3	£1,575
Graphite	3.0	94
Magnesite	77.0	226
Lime	5,907.0	9.276
Flint	110.0	756
Miscellaneous	36.0	217

TOTAL MINERAL OUTPUT.

Gold, £3,256,126; silver, £9,668; coal, £176,187; base metals, £187,701; total, £3,629,685.

ACCIDENTS.

From the table of accidents the following extracts are reproduced, the total number of separate accidents for July being 271 for the Transvaal, and for the Union of South Africa 310. The accident figures for the Transvaal are for the past thirteen months:—

1912.	Separate Accidents.	Killed. White.	Killed. Coloured	Injured. White.	Injured. Coloured.
January	105	3	59	33	149
February	216	7	70	25	161
March	234	4	85	33	165
April	203	3	51	24	160
May	218	5	69	22	163
June	237	3	66	24	199
July	271	3	88	27	206

EXPLOSIVES.

Appended is a summary of the statement showing the quantity of cases of explosives manufactured during July: Transvaal, 22.144; Cape, 41,085; Natal, 20,062; total, 83,291.

THE OUTLOOK FOR DIAMONDS.

Stones in Brisk Demand—Higher Prices—Bright Prospects.

So brisk is the diamond trade that the holidays have exerted no unfavourable influence whatever; in fact, one or two of the largest merchants found it advisable to pay a visit to their offices during the week-end in order not to get behind. Business is now on a very even keel. To some extent the demand still exceeds the supply, this being due, of course, to the manner in which the Diamond Syndicate are feeding the buyers. In all classes of goods business is brisk. More particularly is this the case with the smaller sizes. For some time these have experienced a very keen equiry, and, despite the fact that the sellers have gradually raised prices almost to their former level—the Syndicate have, in fact given another upward twist during the past few days—buyers still readily come forward. The production of the Jagersfontein Mine, on show during the week, was completely sold out. Next week the Diamond Syndicate will market a consignment of Bultfontein goods, for which sights were given away during the past few days. No difficulty is anticipated in the disposal of these stones. In fact, to illustrate how sound the market really is, it may be mentioned that the disappointed applicants for Bultfontein parcels have taken over from the happy recipients of the sights most of the goods at an advance of 5 per cent. The Premier Diamond Company has already started selling its recent shipment, and, notwithstanding the fact that prices are ruling higher, purchasers have not been deterred. The following communication from our Amsterdam correspondent explains the position in the diamond trade in that centre, and states the reasons that led up to the present lockout, which was proclaimed subsequently to the receipt of his letter. He says:—In the diamond trade a conflict is threatening at present, after a long period of industrial peace. Some months ago the well-known jewellers, Messrs. Asscher, who cut and polished the Cullinan diamond, intended to lower the wages for so-called "roses" (one of the forms in which diamonds used to be polished) by 15 to 20 per cent., on account of the depression which at that time existed in the diamond industry. The trade union absolutely refused to entertain the proposal, on the theory that any lowering of wages by one of the jewellers would cause similar action by other parties, and that this would also make for unsettlement of the market, in the same way as a reduction in the price of the raw material would do. The firm thereupon temporarily stopped the production of roses, while continuing work in its other branches. Messrs. Asscher have now taken up the matter again, however, asserting that other firms have lowered wages in the meantime, and that they are not treated fairly in the matter. They have issued an ultimatum to the trade union, and threaten to close down their mill, which is the largest diamond factory in the world, if their wishes are not complied with. Both the firm and the trade union being very strong and wealthy (the union has some millions at its free disposal, and would be in a position to carry on a conflict almost for an indefinite period), the further course of events will be watched with interest.—*Financial News*, August 9.

MINING MEN AND MATTERS.

Mr. John Hay, Chairman of Lydenburg Estates, Ltd., father of Mr. Errol Hay, manager of the Ginsberg mine, who has been on a brief visit to his son, returned to England this week.

* * * *

Mr. M. H. Coombe, who was referred to in our last issue as the manager of the State Mines (Modderfontein), is the assistant manager. The manager of the property is Mr. Bell.

* * * *

Mr. Max Francke, in pre-War days Inspector of Machinery under the old Transvaal Government, and after the War one of the joint managers of A. Goerz & Co., Ltd., up to a few years ago, when he retired and returned to Germany, has been revisiting the Rand and returned to the Fatherland by this week's Imperial mail.

* * * *

The following are the officers of the Witwatersrand Commercial Exchange elected for the ensuing year: President, Mr. R. H. Philpott; vice-president, Mr. W. F. T. Harvey; committee, Messrs. R. G. Campbell Pitt, W. A. Martin, A. Y. Niven, R. B. Greer, J. Wallace, H. Hellman, J. L. Schoeler, J. W. Kirkland, J. McG. Love, and R. B. Langdon.

* * * *

Last Saturday afternoon the members of the Chemical, Metallurgical, and Mining Society of South Africa, and the S.A. Institute of Electrical Engineers paid a visit to the Dunswart works of the Union Iron and Steel Works belonging to Messrs. Cartwright and Eaton, Ltd. The works deal with scrap iron and steel, which is worked up by means of reheating furnaces, steam hammer, and rolls, into bars of various sections, rails, and tube mill pegs. This is a new branch of metallurgical activity in South Africa, and these the only works of the kind at present in operation.

Elandsfontein Estate.

An interim dividend (No. 48) at the rate of 5 per cent. (1s. per share) has been declared, payable on September 11,

THE YEAR WITH THE RAND COMMERCIAL EXCHANGE.

Annual Meeting—Sound Financial Position.

There was a large attendance at the annual meeting of the Witwatersrand Commercial Exchange this week. Mr. W. F. T. Harvey presided and in moving the adoption of the seventh annual report and statement of accounts for the year ended the 31st of July, 1912, said: The copy of the report and accounts submitted gives you particulars as to the financial position of the Exchange, and the general matters which have engaged the attention of your committee during the past year. I may mention that in addition to those matters recorded in the report there has been a large number of details which your committee has had to consider at its meetings, matters which, though not sufficiently important to be placed in the report, are, on the other hand, essential towards ensuring the smooth working of the Exchange. The revenue accounts shows that the actual expenditure has exceeded the receipts by £7 18s. 2d. You will notice that your committee has written off a considerable amount for depreciation on furniture, namely, £123 7s. 1d., which when added to the above shows an excess of expenditure over revenue of £131 5s. 3d. When it is remembered that during the past year we have moved into new premises, and have consequently incurred certain abnormal expenditure, I think you will agree with me that the members may be congratulated that this loss, if it may be called so, is not larger. Comparing the expenditure for the year with that of the previous year you will observe that the expenditure for telephones is higher by no less than £147 5s. 11d., in fact we have paid nearly £500 for telephone calls during the past year. and it may be interesting to record that the average number of calls made on the Exchange is approximately 8,000 per month. This, of course, does not include messages received by members of the Exchange, for which two separate instruments are installed for receiving only. There is one item on the debit side of the accounts, namely, the cost of the function which marked the opening of the new premises, which, of course, will not be recurrent, while the other items, I think, require no comment. On the credit side of the account you will notice that we have received £600 in entrance fees as against £570 which was received from the same source during the previous year. The other items on the credit side are approximately the same as in the previous year. If you turn to the balance sheet you will notice that the actual financial position of the Exchange is remarkably strong, there being £4,000 on fixed deposit, bearing interest, which is the same as at the end of the previous year.

MEMBERSHIP.

In regard to the present membership of the Exchange you will note that the number of members has increased from a hundred and eighty at the close of the past year to a hundred and ninety-three at the present date. In this connection I should like to suggest that it should be understood that seeing that the election of new members is vested with the committee it is undesirable that individual members of the committee should propose or second applicants for membership. I think it desirable that the incoming committee should consider this suggestion and decide whether or not it might be desirable to include it among the by-laws. It is gratifying to note that every important group of mines now conducts its buying through the medium of the Exchange. The Municipality and South African Railways are also represented, and it is interesting to note that appreciation has been shown by the municipal buyer, which is recorded in last year's Mayor's minute, in the following words: "The number of quotations received at the Commercial Exchange are sometimes as many as forty for a single item."

COMPLAINTS.

The committee have received various complaints from time to time from certain buyers as to alleged laxness on the part of the representatives of members, and these complaints have been dealt with in the only way possible, namely, the circularising of members, but it would appear to me from the quotation from the Mayor's minute, that these complaints are not general. Perhaps it may not be amiss to mention here that it would appear to me the buyers themselves are not given sufficient information in regard to the purchase of material by the purchasers whom they represent. I fully recognise this is not the fault of the individual buyers, but I may state that there are repeated instances of inquiries being posted on the boards of the Exchange which are of such a vague nature as to render it quite impossible for any supplier to quote intelligently. It will, of course, be quite obvious that I refer to what may be termed technical material and more particularly to certain electrical requirements. I should like here to record my appreciation of the unfailing courtesy which has been extended to us by the various buyers and representatives of groups at all times.

WEIGHING MACHINES.

You will observe that the scales and weighing machines on the mines have again been assized, and in this connection I venture to again quote from the minute of the Mayor of Johannesburg for the year ended October, 1911, which reads as follows: "The weighing machines of the various mines, both within and outside the municipal area were examined, and in addition most of the weighbridges at the coal mines were tested. Several of the latter were found to be in very bad order. Though there is no obligation on the outside companies to have their weighing appliances assized, they are gradually coming to realise that it is in their interests to see that their scales conform to the requirements of what is regarded, in the Transvaal at least, as the standard test of South Africa. In this connection the Witwatersrand Commercial Exchange, acting in conjunction with the Chamber of Mines, has been largely responsible for this gratifying state of matters." Your committee took steps to insure the correct assizing of weighing machines, and this was again done during the year under review. I should like, on behalf of the Exchange, to acknowledge the assistance of the Chamber of Mines in this connection. The Exchange moved into the present premises on the 16th of September, 1911, and I think you will agree with me that the present premises are admirably suited for the work of the Exchange, and that the increase in rent has been justified.

BUSINESS GENERALLY SLACK.

Before concluding my remarks, I may perhaps say that at the present moment there appears to be no means a plethora of inquiries being received, but we can only hope that matters in this respect will improve in the near future. No doubt the fact that business generally is slack at the present moment accounts largely for the natural desire of merchants to secure business at any price, and surely this, gentlemen, is to be deprecated, as it only tends to the cutting of prices to an absurd degree. So far as this Exchange is concerned its object is merely to bring together the buyer and the seller under the most convenient circumstances, aud its inauguration was brought about by reason of the enormous expense which was incurred previously by the sellers in having of necessity to send representatives to call on each buyer individually, many of whose offices were very far apart from each other. In those days not only was the expense of calling on the various buyers almost prohibitive, but the loss of time entailed, not only to the sellers but also to the buyars, was enormous. As it is to-day I may confidently state that the bulk of the buying is completed by noon every day, and it is generally possible that orders resulting from inquiries posted on the Exchange in the morning are ready for delivery during the afternoon of the same day, and in a large majority of cases are invariably delivered early on the following day; also the representative of the seller is usually free to attend to other work for his employer during the afternoon of each day. These are enormous advantages both to the buyer and the seller, and it appears to me that these advantages are prone to be overlooked. I have remarked above that the buyers do not always post sufficient data with their inquiries to enable a really intelligent quotation to be submitted, but, on the other hand, I consider that the sellers are themselves somewhat to blame in that they do not always send sufficiently responsible representatives to the Exchange to deal with their quotations. I think, however, that this point has, during the past year, been more thoroughly recognised, and that latterly the fact that the responsible members of the firms themselves have attended the Exchange more frequently than they had previously, is likely to have a most beneficial effect. In conclusion I should like to convey the regrets of the committee at the resignation of Mr. A. H. Nicolson, who resigned from the committee during the past year. Mr. Nicolson was one of the original committee when the Exchange was inaugurated, and I trust that at some future date Mr. Nicolson will be able to see his way to rejoin the committee. I wish to record my thanks to the vice-chairman, Mr. R. G. Campbell Pitt, and to the other members of the committee for the great interest they have always taken in the work of the Exchange, and for the assistance they have afforded me. I also wish to record my great appreciation of the able manner in which your secretary, Mr. Robertson, has carired out his duties. I now formally move the adoption of the report and statement of accounts for the year ended 31st of July, 1912.

The annual report and financial statement were adopted without discussion.

The following were the officers elected for the ensuing year: President, Mr. R. H. Philpott; vice-president, Mr. W. F. T. Harvey; committee, Messrs. R. G. Campbell Pitt, W. A. Martin, A. Y. Niven, R. B. Greer, J. Wallace, H. Hellman, J. L. Schoeler, J. W. Kirkland, J. McG. Love, and R. B. Langdon.

A vote of thanks to Mr. Harvey and the retiring committee was accorded.

Rex Gold Mines: Receiver Appointed.

In the Vacation Court, in mail week, Mr. Justice Bankes, on the application of Debenture holders, appointed Mr. Blakemore, chartered accountant, receiver and manager of the Rex Gold Mines, Ltd. Mr. Greaves stated that the company was incorporated in May, 1909, with a capital of £100,000, divided into shares of £1 each, and had issued Debentures, which were repayable on 1st July last. The company had made default in payment, and the principal money was now due. There were also arrears of interest. Counsel also asked for leave to borrow, as sixteen of the claims were held on monthly licences. The company appeared and consented, and also agreed to the usual judgment in a Debenture holders' action.

JULY GRADE, COSTS, AND PROFITS.

Analysis of the Gold Production for the Month

The usual monthly analysis of the gold production for July issued by the Chamber of Mines is presented hereunder. Up to last April the declared output of companies has been presented irrespective of reserve gold fluctuations, which have been dealt with in marginal notes. The present compilation reflects the actual output, excluding transfers, if any, to or from gold reserves. It will be noticed that the working profits for the Witwatersrand have been supplied by 54 companies out of a total number contributing of 55; one concern included, but not returning profits, being a private venture.

The Witwatersrand

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
1. Aurora West United ...	18,078	24	10	19	4	14,071	4,032	5	7
2. Bantjes Consolidated ...	33,707	27	8	23	4	28,405	4,792	3	11
3. Brakpan Mines	90,477	32	1	17	3	48,531	41,077	14	8
4. Cinderella Cons.	21,710	24	5	24	6	21,773	104	1	0
5. City Deep	76,952	36	4	24	4	50,583	24,025	11	7
6. City and Suburban ...	52,532	36	11	21	3	29,871	22,003	15	8
7. Cons. Langlaagte	30,401	24	10	19	4	20,296	10,107	9	8
8. Cons. Main Reef	34,572	28	8	19	2	23,015	11,030	9	2
9. Crown Mines	269.837	32	6	17	10	147,859	118,825	14	4
10. Durban Roodepoort ...	15,177	21	7	15	6	10,898	4,278	6	1
11. Durban Rood. Deep ...	37,185	29	2	23	4	29,692	6,997	5	6
12. East Rand Proprietary	256,380	32	0	21	0	163,338	91,261	11	9
13. Ferreira Deep	106,112	39	5	21	0	56,041	47,943	18	0
14. Geduld Proprietary ...	18,809	26	0	20	6	14,860	3,903	5	5
15. Geldenhuis Deep	74,390	30	2	27	10	67,776	5,681	2	4
16. Ginsberg	21,341	30	4	20	4	14,319	7.020	10	0
17. Glencairn Main Reef .	16,231	14	9	13	2	13,362	2,869	2	10
18. Jumpers-cum-Treasury	15,050	39	0	38	8	13.534	1,522	4	4
19. Jupiter	41,802	20	1	18	9	38,952	2,382	1	2
20. Knight Central	29.322	24	7	19	10	23.347	5,563	4	9
21. Knights Deep	53,241	17	0	11	5	35,556	17,142	5	6
22. Lancaster West	22,539	21	0	21	2	21.726	702	0	8
23. Langlaagte Estate ...	64,137	21	4	17	9	47,680	16,031	5	11
24. Luipaardsvlei Estate .	16,065	19	3	17	3	14,230	1,634	2	0
25. Main Reef West	33,315	31	11	20	4	21,196	11,677	11	2
26. May Consolidated ...	18,002	21	11	14	8	11,766	6.022	7	6
27. Meyer and Charlton ...	37,401	51	10	18	9	13.519	17,546	24	4
28. Modderfontein B. ...	66,719	39	6	17	9	29.992	35,931	21	3
29. New Goch	26,663	19	6	16	7	22,669	3,938	2	11
30. New Heriot	22,092	37	5	22	5	12,796	9,016	15	10
31. New Kleinfontein ...	73.885	28	6	19	9	50,389	22,509	8	10
32. New Modderfontein ...	83,192	39	10	21	1	43,735	38,460	18	6
33. New Primrose	36,777	29	5	14	9	17,608	19,167	16	0
34. New Rietfontein	18,820	24	9	21	0	16,776	3,042	3	10
35. New Unified	17,097	29	8	21	6	12,159	4,937	8	9
36. Nourse Mines	86.101	30	0	20	8	58,987	26,091	9	2
37. Princess Estate	26,128	26	11	25	11	24,910	1,133	1	2
38. Randfontein Central ...	257,953	26	3	18	5	179,045	76,029	7	10
39. Robinson	98,433	40	6	15	6	36,919	58,640	24	7
40. Robinson Deep	79,229	33	4	19	0	45.197	33,033	13	11
41. Roodepoort United ...	32,546	19	1	16	9	28,393	4,127	2	5
42. Rose Deep	95,285	28	10	17	11	59,194	35,002	10	7
43. Simmer and Jack ...	8,824	23	4	11	6	43,657	44,270	11	8
44. Simmer East	33,230	19	6	15	3	25,931	6,888	4	1
45. Simmer Deep	47.838	18	5	16	2	42,060	5,211	2	0
46. Spes Bona Tribute ...	6,779	20	11	—		—	—	—	
47. Van Ryn	54,239	26	11	15	4	30,836	23,419	11	7
48. Village Deep	68.571	26	4	19	8	51,150	16,493	6	4
49. Village Main Reef ...	87,057	40	2	17	3	36,887	48,116	22	6
50. Vogelstruis Estate ...	12,764	20	8	19	11	11,502	1,265	2	2
51. West Rand Central ...	3,560	31	6	32	11	3.160	398	4	1
52. West Rand Cons. ...	38,408	28	5	23	3	31,340	7,032	5	3
53. Witwatersrand	45,540	22	9	14	0	27,986	17.553	8	9
54. Wit Deep	54,906	28	6	18	9	36,095	18,180	9	5
55. Wolhuter	38.790	26	5	17	7	25.818	15.031	10	3
Miscellaneous producers	18,872	—		—		—	—	—	
Witwatersrand totals	3.126,077	28	6	18	8	2001387	1061089	9	11
				54 cos.		54 cos.	54 cos.	54 cos.	

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

Outside Districts.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
Heidelberg—									
1. Nigel	18.049	29	7	25	0	15.039	3.578	6	0
2. Sub Nigel	9.540	41	5	31	3	7,203	1,162	5	0
Barberton—									
3. Barrett	888	5	10	—		—	—	—	
4. Sheba , ...	13,550	41	8	26	10	8,730	4,819	14	10
5. Sheba (Rosetta)	433	25	2	—		—	—	—	
6. Worcester	5,467	25	5	—		—	—	—	
Lydenburg—									
7. Glynn's Lydenburg ...	8,143	46	10	21	11	3,819	4,216	24	3
8. Transvaal G.M. Estates	34.598	49	10	23	2	16,077	17,985	25	11
Miscellaneous producers	38,453	—		—		—	—	—	
Total (outside districts)	129,121	37	6	25	1	50,868	31,760	15	8
				5 cos.		5 cos.	5 cos.	5 cos.	
Grand totals	3.255,198	28	9	18	10	2052255	1092849	10	0
				59 cos.		59 cos.	59 cos.	59 cos.	

S.W. Diamond Fields.

The returns from the various diggings in the South Western Transvaal for the month of July are as follows:—

	Carats.	Value.		
Bloemhof	1,179¼	£7,171	5	0
Mooifontein	1,177½	6,883	8	0
Panfontein	884	3,931	17	6
Blesbokfontein	107¾	1,797	7	6
London	266¾	1,475	5	0
Welteverden	231	1,201	10	0
Christiana	193½	1,080	7	6
Kuilfontein	182¼	823	12	6
Koksrust . ..	112¼	730	12	6
Rietput	125¼	659	15	0
Grootdoorns	139¼	585	7	6
Goedgenoeg	75½	534	1	0
Molderkraal . ..	63¼	343	5	0
Kromellenboog	80¼	305	15	0
Koppiesvlei	39	210	12	6
Schweizer Reneke .	28	150	10	0
Doornbult	22¾	101	15	0
Other sources	69¾	325	15	0
	5,868	£28,618	1	6

The returns for the seven months of 1912 are as follows:

	Carats.	Value.		
January	6,265⅜	£32,026	3	0
February	7,501⅜	31,997	17	6
March	7,874½	37,352	16	9
April	5,904½	26,181	7	0
May	6,693⅝	29,000	10	0
June	6,180¾	26,730	0	0
July	5.868	28,618	1	6
	46,188½	£215,006	15	9

Gumpold's "Unity" T'shisa Stick Factory.
(FUSE LIGHTING TORCHES.)
ALBERTVILLE.
P.O. Box 34, NEW CLARE, Transvaal.
The first Local Factory (authorised by Government.)
These Fuse Lighters **give a brilliant light, stand all concussion, give forth no noxious fumes or gasses, and are cheapest in price.** *Numerous testimonials from different mines on the Rand. Orders can now be executed.* **Agents: SHIMWELL BROS., Johannesburg,** *or from the Factory direct.*

TRANSVAAL OIL SHALE SYNDICATE.

Particulars of a New South African Undertaking.

The statutory meeting of the shareholders of the Transvaal Oil Shale Syndicate, Ltd., was held in Mail week, at the registered office of the company, 52, Queen Victoria Street, E.C., Mr. Alfred Thomas Macer (chairman of the company), presiding.

The Secretary (Mr. H. S. Murphy) having read the notice convening the meeting,

The Chairman said: This is the statutory meeting which, of course, had to be held within three months of the company commencing business, and, of course, after such a short time we have very little progress to report. Upon the issue of the capital the Board allotted 50,000 shares. The applications exceeded that number, but we considered that as this would give us £15,000 clear working capital we should do better, in the interests of the company, to retain the 10,000 reserve shares, which, if our developments are as successful as we anticipate, should realise a very much bigger price than par. As this is the first meeting of the company, and as this is a pioneer company in the shale industry of the Transvaal, a few particulars with regard to the history of this property may be of interest. It was first prospected in 1897, before the war, and shale, taken from the outcrop, was sent to this country and tested by Sir Boverton Redwood. It gave results in excess of 40 gallons of crude oil to the ton of shale. After the war a large amount of prospecting was done by the original syndicate. Four or five shafts were put down to the top seam, and adits were driven. They proved the top seam to be a formation, 5ft. to 6ft. in thickness, of coal and shale capable of being taken out in one working. Afterwards three boreholes were put down. These boreholes were of small diameter, and the results were somewhat unreliable. The No. 1 borehole was put down near the Eastern boundary, the No. 2 borehole 1,000ft. west of that boundary, and the No. 3 borehole about 1,500ft. north of the boundary. These boreholes thus proved a very considerable area of ground. The No. 1 gave four seams of shale varying in thickness from 4ft. 10in. to 24ft., with a total thickness of 45ft. 4ins., and two seams of coal aggregating 9ft. in thickness. The No. 2 borehole gave four seams ranging from 4ft.—the top seam—to 22ft.—the bottom seam aggregating 41ft. 6ins. The No. 3 borehole gave a top seam of coal and shale of 6ft. 4ins.; a second seam of coal and shale, 10ft. 4ins.; a third of shale, 1ft. 3ins. thick, and a fourth of shale 23ft. thick. These results were reported upon by Mr. J. F. Bagshaw, who estimated the shale to average 32 gallons of crude oil to the ton. This crude oil gave 73½ per cent. of marketable results. At that time the property was remote from a railway, and, of course, that was an insuperable difficulty in the way of raising the large amount of capital necessary to instal and equip an oil refinery. This was the position in 1909, when the Middleburg Steam Coal and Coke Company was investigating the chances of turning to commercial account the shale seams overlying their coal seam at Witbank. Those shale seams proved to be of no commercial value, and it was reported to the management that the only seams of shale in the Transvaal the commercial possibilities of which had been demonstrated were these seams at Ermelo.

TESTING THE PROPERTY.

The Middleburg Company acquired an option and proceeded to test the reports and statements which had been made to them by the original syndicate, who were the vendors to the Middleburg Steam Coal and Coke Company. They tested the property by putting in, on the top seam, an adit for a distance of 283ft., and in this adit the top seam averaged nearly 24ins. with 25ins. of coal on the top and 12ins. of coal underlying the seam, giving a total working capable of being taken out in one working, of just over 5ft. Two of the old shafts were cleaned out and the shale driven upon with satisfactory results. An entirely new shaft was put down a distance of 80ft., which encountered at 70ft. a good seam of coal 4½ft. in thickness. It was then decided to check the whole of the formation by putting down a borehole of 5½ins. diameter in the centre of the property to the Dwyka formation, which was expected to be reached at a depth of between 450ft. and 500ft. This boxhole was put down to a depth of 450ft., and at 152ft. it encountered a good seam of coal 5ft. in thickness; at 203ft. it passed through the top formation of coal and shale about 5ft. in thickness: the No. 2 shale seam, 5ft. 2in. in thickness, was met with at 322ft.; the No. 3 seam, 3ft. 10in. in thickness, at 342ft., and the No. 4 seam, 23½ feet in thickness, at 445ft. in depth. The Dwyka was encountered at 475ft. Meanwhile, from the adit two tons of shale had been shipped to this country, and one ton was treated at the Oakbank works. It gave a yield of 27.88 gallons of crude oil and 46.81lbs. of sulphate of ammonia per ton. The crude oil, on being refined gave 62.10 per cent. of total marketable products and 2.8 per cent. of bottoms suitable for grease making. This brings us down to the period when this company commenced operations. It is a matter for argument as to whether the property at that time was not sufficiently developed to have at once endeavoured to obtain the large amount of capital necessary to equip a refinery, but your directors decided to proceed cautiously, and they have arranged to sink the 80ft. shaft put down by the Middleburg Company near the second borehole to a depth of 300ft., at which the big seam of 23½ft. thickness is expected to be encountered. This shaft has been cleared out. It is now equipped with pumping and winding plant, and sinking is proceeding rapidly. We should within a comparatively short time—probably two months—have proved the whole of the seam down to the bigger seam.

NEW REFINING PROCESS.

Another point that has given the Board some concern has been the question as to what process should ultimately be adopted in treating the shale. They were not satisfied that the process usually adopted—which is used in the Scotch refineries—gave the best results of extraction, and they arranged for a further test to be made by Dr. Norman, of the City Central Laboratory, by a new process recently patented. This test was made by making two distillations of 14lbs. each, and gave an average of 30.1 gallons of oil per ton. The products of distillation gave—petroleum spirit, 5 per cent.; burning oils, 36 per cent.; lubricating oils, 38 per cent.; and pitch, 21 per cent. An investigation of the crude oil for paraffin wax gave 6lbs. 13ozs. per ton of shale. The possible yield of sulphate of ammonia was ascertained to be very high, amounting to 64lbs. 15ozs. per ton of shale. The flash point of the burning oil was 119 degrees Fahr., and though it contained .75 per cent. of combined sulphur, Dr. Norman says of this: It will nevertheless be possible in practice, by taking suitable precautions, to produce a crude oil at least approximately sulphur free. I am also of opinion that in practice a larger yield of wax will be obtained, whilst the yield of sulphate of ammonia will be somewhat less than stated above. It will also be possible in practice to raise the yield of petroleum spirit and of burning oil by methods of treatment well known in the shale oil industry." I need hardly say that your directors are very gratified with the result of this test. At the time your directors took over the property the Middleburg Steam Coal and Coke Company were negotiating an option on the remaining portion of the farm through which the railway runs. I am pleased to say that they have succeeded in obtaining an option for us, which has been handed over to this company, on a further 2,000 odd acres, which will bring the aggregate of our holding up to 4,400 acres. This option will cost us nothing if we should not decide to go on with it if the original portion should not prove to be a commercial proposition, but, if it should prove as successful as we anticipate, we shall own the whole farm and have access to the railway on all sides, and be able to put down our main shaft on the railway with our works near to the station, which will be a great advantage to the company. As a pioneer company we have, of course, great difficulties in front of us, and your directors do not seek in any way to minimise those difficulties, but we have also the great advantage that our products are badly wanted in the Transvaal and South Africa. We have there an ideal market, while, so far as I am aware, we do not run up gainst any possible competitor. For example, for sulphate of ammonia, in which our shale is so rich, there should be an unlimited market. It is a product which should be of the greatest importance to the agricultural development of the country which the Union Government is doing so much to foster. We are making a businesslike attempt to establish this industry, and although it is not in mortal to command success, we are doing all that is possible to deserve it. Gentlemen, that is the whole of the business before the meeting; there are no resolutions to put.

The proceedings then terminated.

Otavi Mines and Railway.

The report of the Otavi Mines and Railway Company for the year to March 31 shows a profit of 2,683,767 marks was secured after writing off 867,007 marks and placing 112,203 marks to renewals funds. Dividends of 6 marks per ordinary and 5 marks per deferred share are recommended—the same as for the previous year. The mines have been developed with great success, and with copper at its present price large profits are undoubtedly being made. The Otavi Company is in an excellent position financially, and the directors are to be commended for allocating such large sums for depreciation rather than distributing profits up to the hilt.

Liquidations.

The Langlaagte Proprietary, Ltd., and the Rex Gold Mining Company, Ltd., have been placed in liquidation.

THE WEEK IN THE SHAREMARKET.

Stronger and More Active—Prospects Improving.

THE whole tone of the market has gone on steadily strengthening during the week, and it would seem that the improvement has come to stay. A glance at the subjoined list of stocks will show the substantial and fairly general nature of the rise which, it will be seen, is led by the gilt-edged Rand stocks. Diamond shares are likewise active, and Premier Deferred have enjoyed the long-looked-for rise that was bound to follow the activity in the market for the stones. Tin shares are also more active, though prices still lag behind prospects. There are indications that the investing public in Europe is taking an increasing interest in the Rand, and it is to be hoped that the revival which promises to facilitate the raising of the necessary capital for the dormant mines of the Rand will suffer no check.

* * * *

According to London advices, jobbers' books being clear of shares, the recent demand had a prompt effect on prices; and, no doubt, a certain amount of bear closing helped quotations forward. Unfortunately, the usual lassitude incidental to a nineteen-day account has hindered a general public response, but there can be no question that this little "flutter" has cleared the ground considerably, and the market is looking forward confidently to a renewal of activity in the new account. All down the list gains were shown, and it is evident that the market is now exceedingly sensitive to purchases. Diamonds have been a very strong spot, with Premier Deferred a feature. Rhodesians have improved sympathetically with Kaffirs, and here, again, the level of prices is very generally higher. At the meeting of the Willoughby Company the chairman spoke in a highly optimistic strain, pointing out that labour in Rhodesia is much more plentiful than it has been for a long time past. Stress was also laid on the steady rise in the value of Rhodesian land. Chartered have been well bought, and Shamvas, on the closing of some bear accounts, jumped up smartly. Good news has come to hand of development on the 5th level of the Cam and Motor, and the Lonely Reef is also developing exceeding satisfactorily. In July the Giant Mines crushed 11,000 tons for a return of £17,000 at an estimated profit of £10,000. There has been a moderate inquiry for Falcon Mines, on the statements recently made by the chairman.

* * * *

	Friday, 23rd	Sat., 24th.	Monday, 26th.	Tuesday, 27th.	Wed., 28th.	Thurs. 29th.
African Farms	16 0B	16 3B	16 3B	16 6B	16 9	17 9
Adair-Usher Process	...	1 6S	...	1 6S	1 6S	1 6S
Apex Mines	27 0B	27 0B	26 6B	24 6B	27 0	26 6B
Bantjes Consolidated	23 0B	21 3B	23 3B	23 6B	23 6B	24 3
Benonis	5 0	4 10B	5 0	5 0B	5 0B	5 1B
Bushveld Tins	0 11	...	0 9B	0 9B	0 10B	0 9B
Brakpan Mines	76 0B	...	...	76 6B	78 0	...
British S A.	...	29 0B	28 6B	...	...	...
Blaauwbosch	26 0B	27 0B	27 0B	27 0B	27 0B	27 0B
Cinderella Cons.	24 0S	...	...	22 0B	...	21 6B
City and Suburban	47 0B	47 0B	47 0B	48 0	47 0B	...
City Deeps	61 6B	...	61 6B	62 6B	64 6	63 6B
Cloverfield Mines	6 5S	6 6	6 7	6 6B	6 6B	6 11
Cons. Langlaagtes	26 0	25 9B	26 9B	27 6B	26 9	26 9B
Cons. Main Reefs	19 6	19 6B	19 6	19 9	20 0	20 3
Coronation Freeholds	0 6B	0 6B	0 6B	0 6B	0 6B	0 6B
Con. Investment	21 0B	21 0B	21 0B	...	...	...
Crown Mines	136 0B	136 3B	...	138 0B	137 6B	...
Coronation Colls.	...	...	...	12 6B	12 6B	...
East Rand Cent.	13 6	13 6B	13 6	13 9	13 6	13 6
East Rand Coals	2 4B	2 4B	2 5	2 4B	2 5B	2 6B
East Rand Deeps	...	2 8B	2 6B	2 7B	2 6B	2 6B
East Rand Props.	...	58 0B	58 0B	59 0B	60 0	59 0B
East Rand Deb.	£91	...	£92½	£92½	£91½	£92
Eastern Gold Mines	2 2B	2 2B	2 0	2 1B	2 1B	2 0B
Frank Smith Diam	10 0	10 0	10 3	10 3B	10 3	10 0B
Govt. Areas	21 6B	24 9B	24 9B	24 9B	25 0	25 3B
Glynn's Lydenburgs	27 3	27 3B	27 3B	28 0	27 6B	28 0
Glencairns	3 6B	...	...	...	3 6B	3 6B
Glencoe (Natal) Colls	6 3B	6 3B	6 3B	6 3B	6 3B	6 3B
Geduld Props.	...	24 0B	25 0S	24 0B	24 3B	24 6B
Jumpers	6 6B	6 0B	6 6B	...	6 6B	...
Jupiters	10 6B	10 9B	10 9B	...	11 0B	11 0B
Kaalfontein Diamonds	0 4B	...	...	0 4B	0 3B	...
Klerksdorp Props.	...	3 3S	...	...	2 9B	3 3S
Knight Centrals	14 6B	14 9B	15 3B	15 3	15 3B	15 6
Luipaardsvlei Estates	10 6	...	...	11 0B	11 0B	11 6
Lace Props.	4 1B	4 3B	4 4	4 4B	4 5B	4 4
Lydenburg Gold Farms	2 8B	2 8B	...	2 8B	2 8B	2 9
Main Reef Wests	23 6	23 3B	23 3B	23 3B	22 6	21 9B
Modder B's	68 0	68 0B	68 3B	69 6B	69 0B	70 6B
Middelvlei Estates	...	1 6B	1 6B	...	...	1 6B
Modder Deeps	31 0B	33 6B	33 6B	35 6	36 6	36 6
Meyer & Charltons	92 6B	93 0B	...	...	...	...
New Eras	7 9	7 9	7 11	8 0B	8 0B	8 0B
New Kleinfonteins	27 9S	28 3S	26 0B	26 0B	26 3B	...
New Rietfonteins	...	...	8 0S	8 0S	8 0S	8 0S
New Unifieds	17 0S	17 0S	17 0S	17 0S	...	...
New Boksburgs	1 6B	...	1 9B	1 9B	1 9B	2 0B
Nigels	20 0B	20 0S	19 9S	19 9S	20 0S	18 0B
New Geduld Deeps	2 4B	2 5B	2 4B	2 4B	2 4B	2 4B
Orange Diamonds	...	1 3B	1 5B	1 6	1 5B	1 5B
Premiers Deferred	230 0B	175 0B	...	...	...	...
Pigg's Peaks	12 0B	12 0S	12 0B	12 0S	12 0B	12 0B
Pretoria Cement Co.	51 6B	52 0B	51 6B	51 6B	51 6B	52 6B
Paardekraal Estates	...	0 6B	...	...	...	...
Potchefstroom Est.	1 3	1 3B	1 0B	...	1 3B	1 3B
Princess	9 9B	10 3	9 6B	10 0	10 3B	10 0B
Rand Nucleus	3 3B	3 3B	3 3B	3 5B	3 6B	3 6B
Randfontein Estates	28 3B	29 0B	29 9	30 0	30 3	30 9
Randfontein Deeps	4 6B	4 6B	4 6B	4 6B	...	4 6B
Rooiberg Minerals	29 6B	29 9B	29 6B	29 6B	29 9B	30 0
Rand Klips	4 5	4 4B	4 9	4 6B	4 6B	4 10
Ryan Nigels	3 9B	3 9B	3 9B	3 9B	3 9B	3 9B
Roberts Victors	...	23 9B	23 9	...	23 9	23 9B
Rood. Durban Deeps	25 0B	...	...	25 0B	25 0B	25 0B
Simmer Deeps	2 6B	3 6	...	3 0B	3 0B	...
South African Lands	...	4 6B	4 9	4 10	4 10	4 10B
S. Randfontein Deeps	3 6B	4 0B	3 9B	3 9B	4 0B	...
Sub Nigels	6 0B	6 0B	6 0B	6 0B	6 3	...
Springs Mines	...	14 6B	15 0B	15 0B	16 0B	16 0B
S. A. Breweries	...	...	...	...	40 0B	41 0B
Shebas	5 6B	5 3B	...	5 3B	5 6B	5 6B
Trans. G.M. Estates	47 6B	48 6B	...	48 6B	49 0B	48 6B
Temple Tins	3 4	3 6B	...	...	...	...
Trans. Coal Trusts	46 3B	46 0B	46 0B	46 6	46 6B	47 0B
Tudors	1 4B	1 4B	...	1 6	...	...
Trans. Cons. Lands	30 0B	30 0B	30 0B	...	33 0B	...
Van Ryn Deeps	18 0B	18 0	18 3	18 3B	18 3	18 6
Village Deeps	40 0B	40 0B	42 0S	40 0	41 0B	41 3B
Vogel. Cons. Deeps	1 3B	1 3B	1 3B	1 3B	1 3B	1 4
Voorspoed Diamonds	10 0B	...	...	10 0B	10 6B	10 0B
Van Dyks	2 0B	2 0B	...	...	...	...
Witwatersrands	56 0B	57 6B	58 9B	...	...	57 6B
Wolhuters	...	20 6B	20 9B	20 9B	20 6B	20 6B
Witbank Collieries	45 6B	45 0B	45 6B	45 6B	45 0B	...
Wit. Deeps	53 6	53 0B	53 0B	53 6B	53 0B	51 6S
West Rand Est.	2 9B	3 0B	3 0B	3 0B	3 3B	...
West Rand Con.	13 0B	13 3B	13 0B	...	13 6B	13 9B
Wit Townships	...	...	...	23 9B	...	...
Zaaiplaats	36 6B	36 6B	36 6	37 0	36 6B	36 6

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Prospector with complete plant and transport will shortly be disengaged; holds Blasting Certificate. Would accept work on Mine, or permanent position with Group.

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Electrical Notes.

Electricity in American Mining.

The annual report of the Electrical Section of the American Bureau of Mines states that during the year a permanent organisation of the Section has been effected, and the equipment has been greatly improved. The laboratory has been put in excellent condition. The investigation of explosion-proof motors has occupied more time than any other inquiry. Four motors made by three different companies have been examined, and a fifth is now under test. Two complete reports and one preliminary report have been made covering this work. The tests have been carried on very carefully, and hence have consumed a great deal of time. The investigation next in importance has been the determination of the action of mine water upon the insulation of electric conductors. This investigation, which required much preparation and the purchase of considerable equipment, was started on January 3, 1910, and has been in progress since that date. It will be carried on for at least six months longer. Several other investigations have received attention, principally in the way of preparation and preliminary tests. Among these are an investigation of explosion-proof switches; an investigation of the risk of gas ignition from the breaking of incandescent electric lamps in an explosive gas mixture; an investigation of the behaviour of electric flashes in the presence of coal dust; and an investigation of portable electric shot-firing devices. Some work was done upon an electric methane detector, an electric pressure indicator for the experimental mine, and an electrically operated humidifier for moistening mine air. The electrical equipment of the experimental mine has been under the supervision of the Section. Specifications were written for the generating set, and the plans and specifications for the underground electric wiring were prepared. An outline for a code of regulations, modelled after the English code, for the use of electricity in mines, was drawn up and used as the basis of a report made by a Committee of the American Mining Congress. The report of this committee was adopted almost verbatim by the Pennsylvania Legislature, and has become a law of that State. The testing equipment used in connection with gallery No. 2 has been thoroughly overhauled and arranged to the best advantage. Gallery No. 2 is a steel shell 30 feet long by 10 feet in diameter, provided with paper-cloth diaphragms for retaining suitable gas mixtures. Gallery No. 3 has been re-designed so that tests can be made more rapidly and effectively. This is a small cubical steel box with plate-glass doors. In connection with the cable-insulation test, a very sensitive galvanometer and accessories have been mounted upon a suitable concrete pier in the laboratory and a high-potential testing transformer has been purchased for the same test. A new gallery has been designed for the investigation of electric flashes in the presence of coal dust, and an order has been placed for its construction. The following is a list of the number of tests and observations made during the fiscal year 1911:—

Nature of Tests.	Number of tests.	Number of observations.
Explosion-proof motors	576	5,184
Cable test	250	650
Test of power plant and turbine ...	3	754
Pressure indicator	80	400
Methane indicator	77	360
Incandescent-lamp test	40	200
	1,026	7,548

ANSWERS TO CORRESPONDENTS.

A. R. Way.—Possibly the third named will be of value. We believe the other two syndicates you mention are in liquidation.

"Anxious."—(1) (a) It is impossible to say; (b) advise holding; (c) the company should pay dividends, but is not likely to do so for some time to come; (d) present outlook not too hopeful, but there are large unexplored areas. (2) (a) Perhaps; (b) hold; (c) they should to some degree, although mine of which you write is scarcely within the zone of direct influence.

J. De Lacy.—We do not know of any work specially devoted to the operation you speak of, but the chapter on "Alluvial Tin Mining" in "Tin Deposits of the World," by Sydney Fawns, will doubtless give you a good idea of the process. It consists in separating the cassiterite by hydraulic means in as clean and complete a condition as possible, the result being known as "concentrate," afterwards drying and bagging. Nothing then remains but the shipment of it. It would not be necessary to crush ordinary alluvial material. The clean ore, which is an oxide, is reduced by smelting to metallic tin. For other information required apply to Henry R. Merton and Co., Ltd., 2, Metal Exchange Buildings, Leadenhall Avenue, London, E.C.

C. J. W.—Delivered in England, the ore of the quality mentioned would be worth about £3 per ton. Cannot say what price delivered Lourenco Marques. The quotation is seldom published. The following, from the chairman's speech at the annual meeting, in London, of Willoughby's Consolidated Co., Ltd., on the 2nd August, may interest you:—

"At the time of the formation of the Rhodesia Chrome Syndicate for the purpose of acquiring extensive chrome ore deposits, situated on this Company's land in the Selukwe district, the land owners' rights were commuted, this Company receiving in exchange a considerable block of the Syndicate's shares. Our holding, by subsequent purchase of additional shares at a low price, now represents approximately a 15 per cent. interest in the whole undertaking. We also hold a substantial amount of 6 per cent. debentures and ordinary shares in the Chrome Co., which owns the principal chrome deposits in New Caledonia. Some 18 months ago, through an agreement mutually satisfactory to both the Rhodesia Chrome Syndicate and the Chrome Co., a working arrangement was arrived at by which, instead of being, as hitherto, competitors, these two Companies now practically control the whole market of the world's chrome supply. The effect of this arrangement soon materialised, resulting in greatly increased sales of ore by the Rhodesia Chrome Syndicate at progressively remunerative prices, though the full benefit of the combine will not be obtained until next year, when all sale contracts at lower prices, made prior to the existing agreement, will have been satisfied. The Rhodesia Chrome Syndicate paid its first dividend of 10 per cent. in the course of last year."

Blaauwbosch Diamonds.

A dividend of 7½ per cent. (1s. 6d. per share) has been declared payable on September 12.

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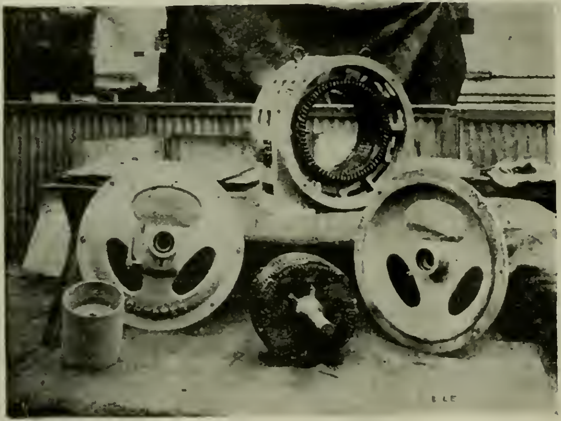

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Engineering Notes and News.

New Safety Shot Firing Appliances.

A demonstration was given at the Westminster Palace Hotel, London, S.W., in mail week, of the capabilities of the Price and Pryse method of safety shot-firing appliances for mines of all kinds. In the course of his remarks, one of the joint inventors claimed that, despite their stringent rules and regulations, there were, last year, no less than 38 deaths and 503, more or less, serious accidents. He asserted, most emphatically, their invention makes shot-firing and the handling of detonators absolutely safe, and casualties impossible; the dangerous and costly process of drilling another hole alongside in case of misfire is entirely obviated, and that no time is lost in searching for unexploded detonators. The invention consists of (1) a detonator shield. This is a casing with perforations to allow direct contact between the gases caused by detonation and the explosive used. Inside this casing is placed the detonator, and, at a distance of a quarter to half an inch from its base, a knot is made on the wires. This knot, when drawn taut against the base of the shield, prevents any strain applied to the wires being transmitted to the internal composition, and, in addition, makes it impossible for the wires and detonator to become detached or separated from one another. An alternative method is provided of attaching the wires to the shield which does not require a knot. The shield also protects the detonators from friction or shock when inserting or withdrawing. (2) The appliance for inserting the shields and detonators, and suitably stemming the hole to permit of withdrawal, consists of a length of copper tube, graduated on the outside, for measuring the depth of the hole. This is provided with a suitable handle and an internal copper rod with a loose spike at one end, attached in a convenient manner, and locking arrangements at the other end, for securing the various parts, which, together, form a complete tool with its own special use. Some account was also given of a test carried out at the Garn Goch Colliery of Messrs. Glasbrook Brothers, Ltd., at Gorseinon, near Swansea, which appeared to substantiate the claim put forward by Messrs. Price and Pryse, the joint inventors.

Victoria Falls Power Co.'s Progress.

At the annual meeting in London, recently, the chairman (the Marquis of Winchester) said, *inter alia*:—" The demands which have been made by consumers of both companies for the supply of power to which they are respectively entitled necessitated that additional capital should be raised in order to supply the demands notified. The progress of our business has been of such a character that even were we not under the obligation to provide further plant to meet the increasing demands on the capacity of our stations, we should be thoroughly justified in doing so by the return which has been made on the capital represented by plant already brought into commission, and in this respect, in referring you to the sum of £323,093—the profit for the year—I should like to emphasise the fact that this profit has been earned although plant representing an expenditure of considerably over £1,000,000 had not been brought into commission at the time to which these accounts refer. During the past year the immense power station at Rosherville was brought into full operation for the supply of both electricity and compressed air, and the sale of power by the two undertakings on the Rand is now one of the largest in the world, being exceeded, as far as I am aware, by few other enterprises. The new station at Vereeniging is already being doubled, and there are now four sets each of 15,000 h.p. being installed there. The first two sets and accompanying boilers should be ready to supply power during next month, and the two extension sets, which are already on the site, will be available early next year. Excepting that again, as in the past, we have been hampered in our work by unlooked-for delays during the past year, due to the stoppage of manufacturing during the

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recent coal strike, and delays in shipping due to dock strikes, I am pleased to be able to report to you that the erection of this large station has otherwise been most rapidly carried out. The progress of the construction of the transmission line has, however, been very seriously delayed by the above causes, owing to our being unable to obtain the necessary insulators. On my arrival in Johannesburg last November on the business of your company, and of the Rand Mines Power Supply Company, I was faced with claims for a considerable amount on the latter company under the penalty clauses of its contract with the Rand Mines, Limited. I should like to testify to the manner in which the representatives of the Rand Mines, Limited, met me in the somewhat difficult negotiations which resulted in the drawing up of a new contract which, while preserving all the rights which had been obtained under the old contract, will not only largely increase the margin of security of supply to the industry, but will simplify the conditions of many of the clauses and give greater security to the consumers. This new contract has not yet finally been agreed, but the points requiring adjustment are receiving immediate attention, and I hope before long that the only questions still open will be satisfactorily arranged."

Big Irrigation Scheme.

The ceremony of turning on the water into the huge dam which has lately been completed in connection with the Murrumbidgee irrigation scheme has now been performed in Australia. The first sub-division of 125,000 acres is to be increased to 350,000, and this area is later to be augmented to 1,000,000 acres of dry land, to be worked in conjunction with the irrigated area. It will be an insurance scheme against drought for 60,000,000 acres of the surrounding country. The Government proposes to establish butter and bacon factories and other accessories required by settlers. The total expenditure on the scheme is expected to reach £3,500,000, and it is proposed to place the settlement under a commission, free of political control. The Burrenjuck dam, which conserves the water, is the second largest in the world. The Assouan dam, opened in 1902, which is the largest in the world, provides a reservoir capable of containing 220,000,000,000. The raising of the dam, which will be completed shortly, will bring its height to 130 feet, and increase its water storage capacity to 506,000,000,000.

Hot Summers and Boiler Explosions.

At the annual meeting of the shareholders of the British Engine Boiler and Electrical Insurance Company, the chairman, Mr. Longridge, remarked that the claims for the year 1911 had been abnormally heavy. This was not to be accounted for either by lack of vigilance in the selection of risks or by diminished efficiency in the matter of inspection, and though he might be accused of frivolity in making the suggestion, he was inclined to think that climatic conditions affected the result. It was an admitted fact that boiler claims were unusually heavy in a year when there was a dry summer and the supply of feed water was deficient both in quality and quantity. It was not so easy to trace a connection between the weather and the breakdowns of either engines or electrical plant except that a sudden frost such as had recently been experienced would certainly increase the claims for breakdowns among gas engines; but, be the cause what it might, the claims ratio for 1911 had been unusually high.—*The Engineer.*

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RAILLESS ELECTRIC TRACTION.

The Costs of such Systems now in Active Service in England.

Mr. R. E. Neale writes in the *Southern Electrician*:— The first trackless trolley systems in England were inaugurated in June, 1911, in the neighbouring cities of Leeds and Bradford. Since then, installations have developed so rapidly that there are now thirty localities seriously considering the installation of trolley 'buses, while systems similar to those in Leeds and Bradford will soon be in operation in the cities of Rotherham and Dundee. The trolley bus has been aptly described as a cross between a tram car and a petrol bus. It possesses the high starting torque and overload capacity of the former, with the low capital cost and flexibility of the latter. The overhead trolley wires are quite unobtrusive, the 'buses themselves are built on good lines, and their traffic dodging capacities are surprising. Curves at 14 feet radius are easily made, and the system as a whole is readily adapted to special circumstances such as are encountered on bridges, level crossings, and so on. If freight 'buses are run on the same route as passenger cars, it is an easy matter to arrange for the faster vehicles to pass the slower at any time or place. There has been considerable discussion as to the extent of road damage likely to be effected by trolley 'buses and as to the basis and means of levying indemnity. So far, it appears that the wear and tear on roads is, if anything, less than that produced by petrol, while the saturation of the road surface with grease and oil at regular stopping places is entirely avoided in the electrical system.

The low capital cost of the trolley system enables the profitable operation of routes on which only low traffic density can be secured. The tractive resistance of a trolley 'bus is of the same order as that of a petrol 'bus, and is much higher than that of tram cars, also, repairs and depreciation are much higher than in the latter, so, that, in no case are trolley 'buses to be regarded as substitutes for tramways, where the latter are laid down on a sound financial basis, but merely as the best available means of securing low operating costs, when the revenue is necessarily low, and of profitably developing the traffic of a district. The most obvious fields of applicability of trolley 'buses are, therefore: (1) In towns with insufficient traffic to warrant the heavier capital cost of a tramway system, and in seaside resorts and other places where erratic seasonal traffic is encountered. (2) As "feeders" to existing tramway and railway routes. (3) In city streets where the rigid route required by tram cars cannot be tolerated. (4) In rural and interurban schemes in conjunction with the transport of farm produce and the supply of energy for power and lighting to houses and communities en route.

The electrical equipment of the vehicles used at Leeds and Bradford comprises two 20 h.p., 525 volt, 1,050 revolutions per minute, commutating pole traction motors driving the rear wheels through a 10:1 reduction provided by oil-immersed worm gearing and roller chain drive. A series-parallel controller has nine current positions, five running, on the main barrel and six on the reversing barrel. Either motor can be cut out at will without removing the controller cover. The speed control provided is much finer and smoother than that on any petrol 'bus. The trolley boom is of the usual tramway pattern, except that in the Leeds vehicles a new type of swivel trolley head has lately been introduced. The trolley wheel swivel pin runs on ball bearings, and, being hollow, carries a tail spindle terminating in a ring. The object of this is to facilitate the placing of the trolley wheels on the overhead wires. Standard trolley wire is used to supply current, the spacing adopted in Leeds is 13·5 inches between positive and negative, and nine inches between positive and positive, unless wider pitch is required for the accommodation of frogs and crossovers.

The Bradford trackless route is about 1·25 miles in length, and cross-connects tram route radiating from the city. It is fed from the tramway feeders at each end, and a maximum drop of four volts has been observed in each trolley section. The Leeds route is four miles in length, and the final three miles are fed from the point at which the route leaves the tramway. With two 'buses running 30-40 volts drop occurs in this three miles of trolley route, hence a negative feeder is being run near the far end of the latter from an adjacent tramway. To enable their 'buses to run over any trolley tram route, the Railless Electric Traction Co. provide pivoted return-current skate booms beneath their vehicles. The rail skate consists essentially of a rail scraper and brush, a guide wheel and a 20-pound copper contact block. Its construction has proved satisfactory, except that the skate is rather liable to jump the rails and to follow the wrong tracks at points. To overcome these defects, while securing a lighter and cheaper design, the Leeds Corporation adopted bogie-collectors. As regards smoothness of running, the writer has found trolley 'buses to compare favourably with the best petrol 'buses, while the high frequency vibration due to the engine of the latter is, of course, absent. In Leeds, semi-elliptical plate springs carry the 'bus body, but in Bradford level spring "shock absorbers" have been adopted. The 'buses at present in use exceed the statutory weight limits, but in future no difficulty is anticipated in bringing the weight of the vehicles down to 4·0 or 4·25 tons. The 'buses cost $3,500 apiece, and the overall cost of the necessary street equipment averaged $8,670 per mile in Bradford and $6,220 per mile in Leeds. The trackless system avoids the heavy track costs of tramway installations, but will often be assessed for road improvements which should have been effected long ago. A capital charge of 5 per cent. usually averages 0·75 cents. per car mile in the railless system. The current consumption of the vehicles ranges from 0·85 to 1·00 kilowatt-hour per car mile; the maintenance is contracted for at 3·0 cents. per mile, and the total operating costs, including capital and depreciation charges, vary from 11·0 to 13·0 cents. per 'bus-mile, while the revenue varies from 12·0 to 17·0 cents. per mile. The Bradford fare is two cents. for 1·25 miles, but in Leeds only four cents. is charged for a four-mile journey. In the latter city, the operating costs and revenue are very closely balanced. Whereas two cents. per passenger mile is required by petrol 'buses, from 1·0 to 1·5 cents. per passenger mile is profitable to trolley vehicles. There seems no reason to doubt that from two to four cents. per 'bus mile net profit can generally be realised. This is satisfactory in the classes of service to which trolley 'buses are best suited. A passenger service is often very desirable, though there is no immediate prospect of remunerative traffic unless several towns propose to instal a system.

A Plant to Grow on Waste Dumps.

The Narrah or Narra is one of the most interesting products of nature. For the inhabitants of the territory of Walfisch Bay it is of the utmost importance, being practically their only food. A failure of the narra season would inevitably mean death from starvation for hundreds. The plant—if such it can be called—belongs to the species of cucurbitacaea or pumpkins, but unlike all pumpkins or melons it is leafless. The leaves are crippled in their first formation and from their centres shoot out, always in pairs, long and very sharp thorns. And this is the very protection needed against animals devouring the fruit. A kind Providence seems to have given the plant specially to the poor inhabitants of the desert, and thus protected and preserved it for them only. The root is not unlike a bramble-bush root, and goes 40, 50, and 60 ft. down through the sand-dunes until it strikes moist ground. A further protection was needed against the terrible sand-storms raging almost daily and forming immense chains of sand-dunes. For that purpose the plant was given a marvellous power of growth. No matter how often the stem may be covered with sand, its growth always outstrips the sand and the stem remains "top-dog" and pierces through. If it had leaves like the pumpkin or melon, the sand would weigh them down and with them the stem, which would then be irretrievably lost and perish.—*Colonial Office Journal.*

Finance, Commerce, and Industries.

National Bank Dividend. An interim dividend of six per cent., payable on the 16th of September, has been declared by the National Bank, payable to all shareholders entitled thereto registered in the books of the company on the 31st of August, 1912, and to holders of coupon 18 attached to the share warrants to bearer. The transfer books of the bank will be closed from the 2nd to the 7th of September, 1912.

* * * *

Standard Bank Dividend. The Standard Bank of South Africa has declared a half-yearly dividend at the rate of 10 per cent. per annum and a bonus at the rate of 3 per cent. £30,000 is devoted to writing down assets, £10,000 is added to reserve, and £10,000 to the pension fund, while £50,000 is carried forward.

* * * *

Pretoria as Industrial Centre. At this week's meeting of the Pretoria Chamber of Commerce the executive reported:—A letter was recently received from the Department of Commerce and Industries enquiring on behalf of the Office of the High Commissioner for South Africa, what special facilities Pretoria possessed, and would be prepared to offer for attracting those who were making enquiries in London for land for industrial purposes. This letter is one which has been received by your Chamber, in common with several other Chambers and Town Councils in South Africa. A lengthy reply has been addressed to the Department enlarging upon the following specially desirable features amongst others possessed by Pretoria in this respect:—(1) Large tracts of town lands and also many vacant erven privately owned in proximity, which could be purchased at very low figures. (2) The desire of the Town Council to lease portions of the town lands suitable for industries on very reasonable terms. (3) The close proximity of the land to the centre of the city, and railway, and the ease with which sidings could be constructed into the site of any factory. (4) A plentiful supply of light and power (large power supply, about the lowest of any municipality in South Africa). (5) An abundant and pure water supply at a very low rate for industrial purposes. (6) Reasonable rates for skilled and unskilled labour in the town and district. (7) Exemption from payment of assessment rates on land and premises leased from the Council. (8) A healthy climate, and all advantages pertaining to a city equipped with a useful tramway system, magnificent fire protection, and the early completion of a good sewerage scheme. (9) A central position in proximity to good markets, on a railway radiating to Capetown and Pietersburg, Delagoa Bay and Zeerust, with prospective markets in Rhodesia. (10). Low railway rates for distributing manufactured products. (11) Cheaper coal than can be had in any other large centre in South Africa. (12) The existence of mineral deposits on town lands and in the neighbourhood of Pretoria.

* * * *

The Brussels Sugar Convention. The Reuter South African Press Agency states that the decision of the Government to withdraw from the Brussels Sugar Convention in September next year has been greeted with a chorus of approval from Liberals, and of condemnation from Unionists. The Convention was negotiated and signed in 1902. Great Britain and all the great Powers, except Russia, were parties to it. It was due to the interest created by Mr. Joseph Chamberlain in the condition of the West Indian cane sugar industry, the depression in which, he contended, was due to the unfair competition caused by the large bounties granted by most of the Continental States to the sugar produced from beet in their territories, that Mr. Balfour was able to negotiate the Convention, which was an agreement by the contracting parties to tax sugar imported from bounty-paying countries by the exact amount of the bounty. The Convention was immediately followed by the disappearance of the bounties in most States. Opinions are sharply divided as to the results of the Convention. While Liberals say that it made sugar dearer for the British consumer and benefited, not the British West Indies, but Cuba, Java, Porto Rico, and other territories which did not join the Convention, Conservatives argue that it has not affected the British consumer, and has given a fillip to the British West Indian cane sugar industry. In 1907 Russia adhered to the Convention, but was allowed to retain her system of bounties on the condition that her exportation of sugar should be limited to 200,000 tons. At present Russia has on hand stocks enormously exceeding the figure of 200,000 tons, having had a good beet harvest, while France and Germany have had bad ones. Russia and Great Britain have, therefore, been applying to the Permanent Commission, under which the Convention's policy is administered, to have the limit of Russia's exportation raised from 200,000 to 500,000 tons. This proposal was not accepted by the other Powers, and the British Government has therefore withdrawn from the Convention, undoubtedly basing its decision on the ground that, while the professed policy of the Convention is to keep sugar at a steady and reasonable price, the refusal of the Commission to raise Russia's quota to relieve the restriction of supplies amounts to an undesirable artificial hampering of the free course of trade.

* * * *

Six Months' Imports. Imports into the Union for the half-year ended June 30 were valued at £17,181,389, as against £17,273,297. This is exclusive of Government imports and specie, and there is accordingly a small decrease indicated. The principal decreases, when analysed, however, show more reason for satisfaction than otherwise. For instance, the imports of grain and flour totalled only £399,802, as against £614,376, or a decrease of £214,574 on the half-year. The import of wheat decreased from £255,715 to £125,201, and of flour from £292,662 to £198,444. It is certain that there was no decrease in the consumption of bread in the Union during the period in question, and the natural conclusion is that local production increased materially last year. This is borne out by general knowledge of the larger areas being devoted to wheat production.

* * * *

The Cost of Living. Speaking to a gathering of members of the Newspaper Press Union of South Africa and other newspaper representatives, last week, Mr. W. Hosken said unless they aided manufacturers by taking duties off the necessaries of life—above all, taking the duty off bread, which to-day was taxed 50 per cent. in the Transvaal—cheapened the cost of living, and enabled family life to be established in this land, they would never have that increase of white population they were all crying out for. So long as they had dear bread, they stultified everything in the way of advance in this country. If they meant to have family life here, and bring that state of affairs such as they had to a large extent at Modderfontein, they must have a better fiscal policy, and manufacturers must have a better chance of not having taxes on the necessaries of life—which piled up needlessly and uselessly the costs of production.

* * * *

Rand Water Questions. The question of the supply of water to the Johannesburg Municipality, which was so uncomfortably to the fore during the drought of last year, is now engaging the attention of the Water Committee of the Town Council, and no doubt some evidence of their deliberations will be presented to the meeting of the Council. It appears that the Rand Water Board have asked the Council for an estimate of their requirements to cover the next eight years. This only can be arrived at by taking the actual results since the Council took over some seven years ago, and find out what the consumption has been, and to what extent the population has increased. The increased consumption of water works out at about 52 per cent. over the seven years. If the Council assume the same increase in population, and consequently a like ratio in water requirements, it will mean that they will want an average of three and a half million gallons a day. That, of course, is the average figure, but there are certain periods of the year when the requirements are abnormal, and a figure as high as seven and a half million gallons may be reached, but for a very brief period only. Last summer, it will be remembered, there was not sufficient water to cope with the demands, and a very serious position was created. The point is whether it will be necessary to go farther afield to get an increased supply, or whether the position can be met by establishing increased storage accommodation, say, at Yeoville or at Turffontein, at a cost of some £50,000, and whether the standing charge connected with tapping an enlarged area would be justified as compared with the capital outlay for conserving water. The Council estimate that they will require twelve hundred million gallons per annum, giving an average daily consumption of about three million gallons, while the maximum requirements may be in the neighbourhood of seven million gallons in abnormal times. The development of the water-borne sewerage scheme will have a very marked effect in the increased demand.

* * * *

The Tea Industry.

At the monthly meeting of the Durban Chamber of Commerce, last week, the chairman, Mr. Karl Gundelfinger, laid stress upon the fact that the exports of tea had fallen away to a very remarkable extent. He attributed this to the stoppage of Indian immigration. In course of conversation with one of the most prominent members of the tea industry, it was stated that the industry is stagnant, and practically no development has taken place since the intention of the Indian Government to stop emigration to Natal became known. The existing tea fields yield about the same as was produced three years ago, and the decrease in exports is due to the larger local consumption and not to the lack of development. At the present time, and for fully twelve months past, the demand in South Africa for Natal grown tea has far exceeded the supply, especially in the better grades. The future of this industry is a gloomy one owing to the scarcity of sufficient labour. It is well known that tea requires much more delicate handling than maize or sugar, for which labour-saving appliances can, to a great extent, be used, but not so for tea.

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Transvaal Land Bank.

The annual report for the period, April 1, 1911, to March 31, 1912, of the Transvaal Land and Agricultural Bank has just been issued, and provides interesting statistics. The report states that during the period under review 1,304 applications were received, representing £551,174, making a total received since the opening of the bank, on the 4th November, 1907, of 7,680 applications, representing £3,301,231. The loans approved of by the Board amount to £458,800, of which, however, loans representing £94,075 were declined by applicants; £362,325 being accepted. A table attached to the report shows that the largest portion of the loans were apportioned to the Ermelo district, the amount being £53,490, the total amount since the opening of the bank being £179,315, the value of the security, farm property, being £549,374. The lowest amount was allotted to Krugersdorp, being £5,710 for the year, and since the bank was started £79,845. An analysis of the loans show that there were 31 over £1,500 and not exceeding £2,500, 37 over £1,000 and not exceeding £1,500, 142 over £500 and not exceeding £1,000, 258 over £250 and not exceeding £500, 361 over £100 and not exceeding £250, 308 over £100 and under. Since the bank started, and up to March 31, the total number were:—128 over £1,500 and not exceeding £2,500, 212 over £1,000 and not exceeding £1,500, 718 over £500 and not exceeding £1,000, 1,338 over £250 and not exceeding £500, 1,927 over £100 and not exceeding £250, and 1,338 of £100 and under. The purposes for which loans were made were:—(a) To effect improvements, including farm buildings, irrigation works, fencing, and planting of trees. (b) For purchase of stock, plant, and agricultural requirements generally. (c) To pay off existing liabilities on land. (d) To pay costs incidental to subdivision of land. (e) For the establishment and promotion of agricultural and rural industries. (f) For the purchase of land for any of the purposes described under (a), (b) and (c). The repayments during the year under review amounted to £188,465 3s. 10d., making a total since the opening of the bank of £426,429 6s. 8d. During the year properties mortgaged to the bank in the following districts have been inspected by the bank's inspectors:—Carolina, Middelburg, Potchefstroom, Standerton, and Zoutpansberg. As in previous years, they report in satisfactory terms on the condition of the bank's security, and the general and continued improvement in the agricultural industry of the Transvaal Province, resulting from the financial assistance afforded by the Land Bank, and no item in their reports calls for any special comment otherwise.

* * * *

Johannesburg Municipal Finance.

The following are the main points of the municipal budget submitted to the Town Council by the Chairman of the Finance Committee. Last year he foreshadowed an expenditure of £726,617, and revenue of £716,972, going forward with an estimated deficit of £9,645. The actual working results show, however, considerable variation in these figures, the revenue being approximately £761,700, and the expenditure £735,900. The revenue has, therefore, exceeded the estimates by £45,000, and the expenditure has also exceeded the original estimate by £9,000, the result being a credit balance of £25,000 instead of an estimated deficit of £9,600. The estimates of revenue for the year, including the sum of £22,000 taken from treasury balances, is £729,000, against an estimated expenditure of £746,000. The estimated actual revenue shows a falling off of £54,000, while the expenditure is increased by £12,000. The following is a summary of the benefits accruing to ratepayers and residents for the last three years:—Reduction of 25 per cent. in assessable values, provision of a large sum for capital expenditure ex revenue, reduction in minimum fare of tramway department from 3d. with 10 per cent. discount on coupons to 1½d., with 25 per cent. discount, reduction in the average price to consumers of electric current from 5¾d. to 4d. per unit, reduction in price of water from 5s. 6d. to 5s. per 1,000 gallons, reduction in price of gas from 15s. to 6s. per 1,000 cubic feet, reduction in various sanitary charges, reduction in various trading licences. The following are extracts from the Chairman's speech, which are of general interest:—Allocation of £4,000 to the Art Gallery vote, making the total amount now available for this building £46,600. "I trust," he said, "that a start will now be made in the erection of this building. It seems to me that the public have not yet realised what a magnificent collection of pictures the town possesses, and will not fully appreciate it until those pictures are housed in a building worthy of the name. We have to-day the opportunity of making Johannesburg the art centre of South Africa, and I consider it is one of the primary duties of the Council to endeavour, as far as possible, to promote and further any suggestions that may lead to the attractiveness of this great city. The fact must not be lost sight of that, as a community, we depend for existence on the continuance of the mining industry, which has, after all, but a limited life. By a natural process of evolution, manufacturing industries may, in course of time, spring up, and wherever possible municipal encouragement should be given to such ventures. There is no reason, also, why this city should not become a great educational centre, and here again there would appear to be much that the municipality could do by means of land grants, or even money grants. In all seriousness I throw out the suggestion to the Council that the time is not far distant when, unless we wish to see this great town commence a process of steady decline, we must evolve ways and means of perpetuating the growth and prosperity of the city when the big gold producing industry becomes a diminishing factor." A rate of 1¼d. for the half-year was declared.

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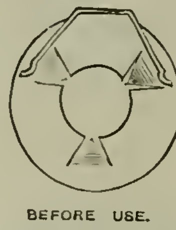

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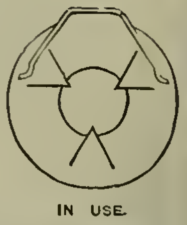

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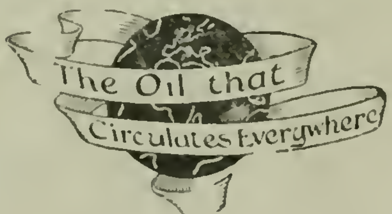
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Automobile Notes.

The Rand-Coast Road.

During the week the motorist community have been greatly interested by the many Press accounts of the tour of investigation, undertaken by several prominent members of the Transvaal Automobile Club, in the interests of the much-discussed and important Johannesburg-Coast route. There seems to exist no two opinions on the desirability of a great artery connecting the Rand with the sea-board. The agitation of the Natal motorists, it may be remarked, for the betterment of the road system of that Province, has induced the Administration to enterprising effort in this direction, with the result that the portion of the main route in question from the Transvaal border, may be classed as in excellent condition for motor touring. That the road, taken as a whole, is favourable to the car can be gauged by the fact that the several machines of the inspecting parties completed the run from start to finish without the least mechanical or tyre trouble. It must be borne in mind, however, that the weather conditions, in the Transvaal in particular, where, by the way, the road in parts leaves much to be desired, favoured the tour largely, and that with the advent of the rains portions now easily negotiable will probably, pending the work of construction, be transformed into formidable quagmires. Those sections, however, where, for example, black ground predominates, are being brought to the notice of the Provincial Administration, and doubtless the desired improvements will be speedily effected. A lot of sympathy, one notices, is extended to the tired Randite by the enterprising dwellers in the "Garden Colony," much stress being incidentally laid upon the necessity of getting away from the dust-laden atmosphere of these parts; at the same time very little is heard of the importance which may, in turn, attach to an exchange of visits, and the interesting and instructive results which might attend a motor tour from the coast to the Rand. When the construction of the grand trunk road, therefore, is completed, it is hoped that many Durbanites and other motorists on the sea-board, will avail themselves of the facilities which will offer to visit the great gold fields.

The "Valveless" Car.

The simple principles underlying the "valveless" motor car, it would appear, have yet to be appreciated by the South African motorist, and a brief mention of a few of its general features may be interesting. The engine of the "valveless" car works on the two-stroke principle, the design being entirely original, and characterised by a remarkable absence of unnecessary machanism throughout. Numerous attempts

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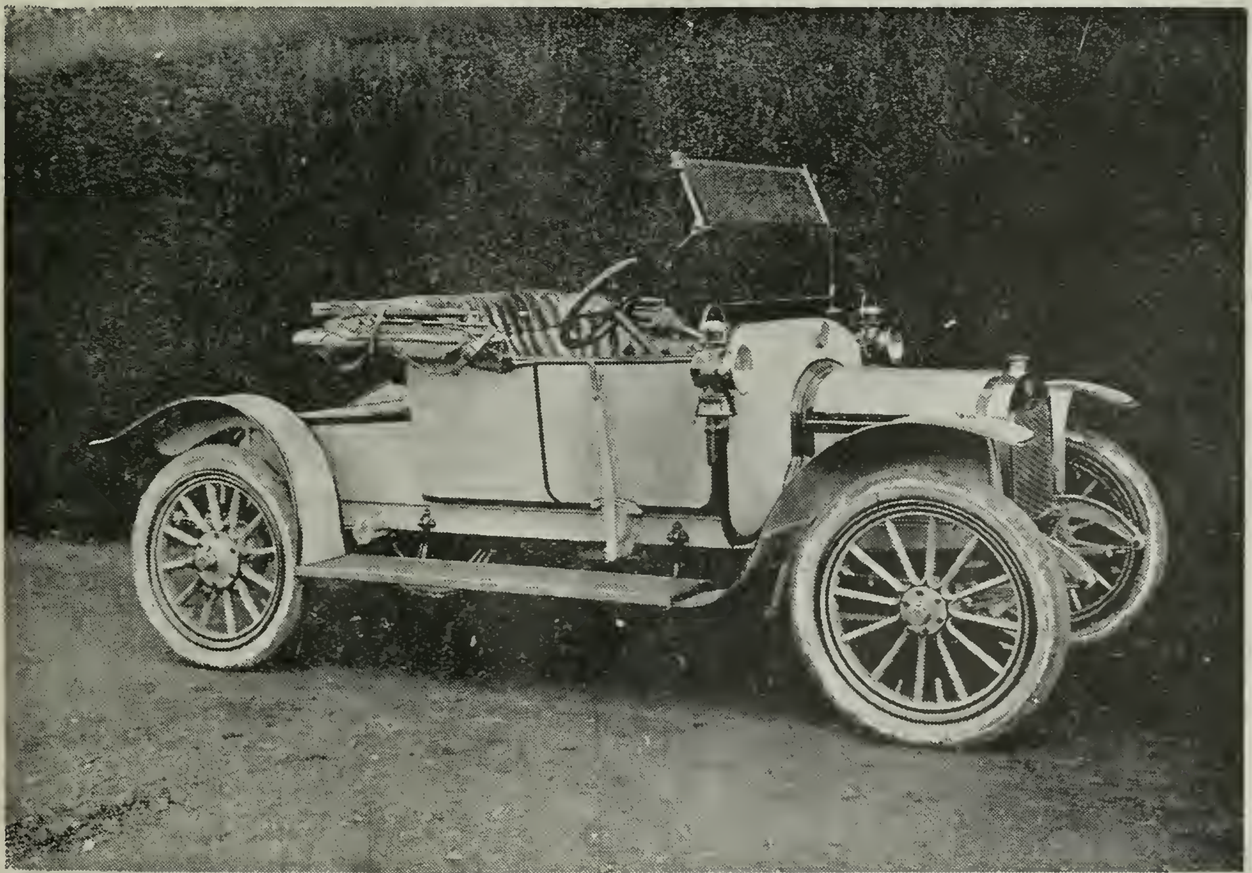

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in the past have been made to produce a successful two-cycle engine for automobile work, and the variations in designs and principles have been remarkable. These early motors, however, suffered from certain defects, and the designers of the "valveless" engine concluded that any success to be attained must be arrived at on entirely new principles. Convinced that the two-stroke system was ideal, the makers were determined to overcome the earlier defects in this departure, and have met with a success altogether gratifying. Beginning at simplicity the manufacturers have succeeded in effecting the estimable combination, of reliability, low cost of upkeep, and freedom from trouble. The "valveless" car is fitted with a four-speed gear box, specially designed for ease of change. The worm-driven back axle ensures absolute silence, with freedom from breakdown, while providing a maximum clearance of ten inches. Fitted with long flat road springs, the comfortable riding made possible thereby over the roughest roads makes a direct appeal to the motorist in these parts where the road system has little claim to perfection. In short, having in view the immense field of operation which South Africa offers, it is a matter for surprise that the manufacturers should have delayed so long the introduction of a machine to this country embodying so many excellent features, in point of Colonial use.

The Dust Evil.

The endeavour towards eliminating the dust evil in the past has involved the expenditure of many thousands of pounds on the Rand, and although much that is satisfactory has been effected, by the use of tar macadam and other coating, there is still great scope for reform in the matter of dust allaying; the prevailing winds at this particular season furnishing a forcible reminder of this fact. The responsibility of the authorities is certainly great in this matter, but the difficulty of the problem is equally great. Recognising the eagerness to test any genuine preparation for dust-laying, or for the general construction of roads on up-to-date lines, which the various municipalities display, a reference may be permitted here to an asphalt, known as Roadoleum, supplied in various grades of consistencies, and meeting a manifold purpose, in that it can be used as a dressing for laying dust, and surface maintenance, or for a binder in construction or re-metalling. It has been used with excellent results on many English roads, and has established beyond question a claim to recommendation, owing to the great resistance it offers to extremes of weather. Its adaptability for use in S.A. may be gathered from the fact that it presents a strong wearing surface and is not adversely influenced by heavy rains.

"Here and There."

The speed contest, referred to last week, arranged for the 7th prox., will be responsible for some very fast times, judging by the remarkable turn of speed several machines, of possible entrants, are capable of affording.

* * * *

The inconvenience occasioned to the medical profession in Johannesburg by the absurdity of a speed limit of ten miles per hour is very pronounced, and it need not come altogether in the nature of a surprise should a protest be lodged against the Council in point of the regulation by this body. The restriction, in the first instance, is an undoubted imposition on all motorists, who as responsible citizens should have a controlling voice in the regulation of the

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traffic. In the case of the profession referred to, having respect to the indispensable nature of the car, the by-law seriously hampers the important discharge of the public duties involved.

* * * *

The legislation which the Government purpose introducing in the matter of motorist licences, will be welcomed by the majority of those interested. It has been pointed out that the test of skill as a preliminary to the issuing of a licence, is a futile measure, and in support of this it is inferred that it is not the novice who drives to the danger of the public. The majority of offenders are certainly skilled motorists, and recklessness, as it is understood, need never be laid to the charge of the driver in the novitiate stage, but the danger to the public is still very real when the incompetent person is at the wheel. The licensing of all motor car drivers is calculated to eliminate the risks in the latter connection.

* * * *

The practice, so much in vogue at the present time, among the patrons of the motor cycle, of allowing the occupation of the luggage carrier by another party cannot be too strongly condemned. This overloading was responsible for a bad accident last week in which the occupant of the improvised seat, afforded by the carrier in the rear of a cycle, was violently thrown to the ground. It would appear, however, that nothing less than a fatal accident will urge the authorities to act in the suppression of this highly dangerous practice. In justice to ladies, who figure prominently in this matter, and who obviously are unaware of the attendant risk, the practice should be discontinued.

* * * *

The Electric Utility Co. of South Africa at present are carrying a large and varied stock of the latest designs and inventions in electric accessories for motor cars, and which are fully described in an interesting illustrated booklet issued by the firm. Among their many specialities is a motor watch, thoroughly well made and reliable, and which is splendidly constructed to withstand vibration. Dynamos for car lighting, which this company stock, should appeal in interesting fashion to the motorist. These can be fitted in a few minutes to any car, and are at once a serviceable adjunct, while their claim to being dust-proof and at the same time fool-proof, is worth the consideration of the car owner.

Despite the efforts of a special deputation, which waited on the Capetown City Council, with conclusive argument in regard to the absurdity of the low speed limit, the "City Fathers" agreed to a resolution, when the deputation had withdrawn, fixing the speed limit at eight miles for motor vehicles within the city's boundary.

* * * *

Motor car manufacturers, or those of their number who are seriously turning attention to Colonial machines, are making a careful study of the adaptability of the wheel to the South African road. The absence of this was well known to every motorist, especially in the earlier days of motoring in this country. The study, however, of the relation of the wheel to the road, will enable motor car designers to effect a great and much-desired improvement in the riding qualities of the machines of the future.

* * * *

Some motorist papers have conceived the idea of an agitation in regard to the rise in the price of petrol spirit and while wishing them every success in the matter, the fact cannot be concealed that the factors influencing the petroleum market are such that a Press campaign against the high prices obtaining has little chance of effective results.

* * * *

Though it is quite a year since the commencement of the action against the Argyll Company, instituted by an American firm for alleged infringement of patents in regard to the sleeve valve engine, the former show no disposition to discontinue the production of this type of engine. Instead, they are manufacturing in considerable numbers.

Answers to Correspondent.

Automachin.—We are making full investigations in regard to your enquiry and will reply in an early issue.

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QUARTERLY REPORTS.

Jumpers G.M. Co.

The report for the quarter ended the 30st of July of operations at the Jumpers states that from 22,830 tons milled and treated the revenue from gold recovered was £44,587. Working expenses absorbed £40,661, or 35s. 7.447d. per ton, which left a profit for the quarter of £3,926, or 3s. 5.274d. per ton. From accumulated slimes treatment there was a profit of £1,600, making a total profit for the period of £5,526, which has been dealt with as follows: Handed over to the Treasury Gold Mines, Ltd., in settlement of their share of profit, £1,961; set aside in terms of agreement with Treasury Gold Mines, £778; appropriated by this company, £2,787; total, £5,526. The company holds freehold rights over its claim area. The following is a list of the company's share investments on the 31st July: 102,700 £1 shares Benoni Consolidated Mines, Ltd.; 45 £1 shares Geldenhuis Deep, Ltd.; 290 £1 shares Witwatersrand Native Labour Association, Ltd. (12s. paid); 118 £10 shares Rand Mutual Assurance Co., Ltd.

Bantjes Consolidated Mines.

The directors submit the estimated financial position of the company as at 30th June, 1912, as reflected in the interim balance sheet, working expenditure and revenue account for the quarter, and appropriation account (subject to audit), also particulars of the quarter's development, reduction operations, etc. Working expenditure and revenue account for the quarter ending June 30, 1912: To mining expenses, mining, £46,135 (12s. 10d. per ton); development redemption, £16,126 (4s. 6d. per ton); total £62,261 (17s. 4d. per ton); to reduction expenses, £16.602 (4s. 8d. per ton); to general expenses, mine, £4,032 (1s. 1d. per ton), head office, £2,893 (10d. per ton); total working expenditure, £85,788 (£1 3s. 11d. per ton); to working profit carried down, £17,761 (5s. per ton); by gold account, £103,549 (£1 8s. 11d. per ton). Interim appropriation account (subject to amendment).—To Government Tax (estimated) for three months ending 31st March, 1912, £1,363; for three months ending 30th June, 1912, £1,400; total, £2,763; to dividend account: Interim Dividend No. 1 of 5 per cent.; declared 11th June, 1912, £25,115; to balance carried to balance sheet, £39,845; total £67,723. By balance brought forward, 31st December, 1911, £28,626; by balance of working expenditure and revenue account: For three months ending 31st March, 1912, £20,790; for three months ending 30th June, 1912, £18.307—£39,097; total, £67,723. The profits appropriated in the last quarterly report, amounting to £1,537, have been reversed. The credit balance of appropriation account is not wholly available for distribution as the capital expenditure for 6 months ending 30th June, 1912 (£2975) on new construction and £132 property account), have not yet been appropriated. The amount to be appropriated for these sums will not be determined until the end of the financial year. Development Work.—Number of feet driven, sunk and risen, exclusive of stopes, 4.071 feet. The reef disclosures were as follows: Main Reef Leader, distance exposed, 335 feet, width, 14 ins., assay value, 85s. 3d.; South Reef, distance exposed, 1.765 feet, width, 12 ins., assay value, 92s. Reduction Works: Ore received from mine, 81,396 tons; waste sorted out, 12 per cent.; tonnage crushed, 71,670 tons; No. of stamps operating, 78; number of tube mills operating, 3; value of ore before crushing (reflected by mill yield and value of pulp); Mill yield per ton, 17s. 9d.; assay value of pulp, 12s. 6d.—30s. 3d. (The value per ton is calculated at 84s. per fine oz.). Total yield, 24,755 ozs. fine; total yield per ton, 29s. General.—The tons developed for the half-year are; South Reef, 34,590 tons, value 34s. 5d. In addition to the above tonnage developed, there were exposed by driving a further 81,500 tons, which promise to be payable, but which are not yet fully developed and valued. The development footage for the quarter shows an increase of 509 feet. The disclosures on South Reef continue promising, whilst payable leader values have been exposed in the area between the central and west shafts on the upper levels. Cross-cutting is being carried on to reach the leader on several of the lower levels of this area; where intersected on the 6th level the values so far met with have been disappointing. The working costs show a reduction of 1s. 6d. per ton for the quarter, but owing to the reduced grade of ore crushed, the profits earned are only £380 higher. The reduction plant continues in good order, and the residues remain low. It has been necessary, owing to the shortage of hammer boys, to increase the use of machine drills in the stopes, and about 20 per cent. of the rock for the mill is now being broken by machines. This use of machines has caused a slight increase in the stoping widths, and in consequence has had the effect of decreasing the grade somewhat. The capital expenditure for the quarter was £1,271 2s. 1d., whilst an amount of £6,726 is required for the completion of authorised work, including the additional expenditure mentioned in the last quarterly report, for a "Turbo Air Compressor" and a laboratory for the medical officer.

Rose Deep.

The report on the operations at the Rose Deep for the three months ended the 30th of June also embodies the interim balance sheet, working expenditure and revenue account and appropriation account (subject to audit). The interim (abridged) balance sheet shows on the credit side for sundry assets—shares, stores, live stock, furniture, sundry debtors, and payments in advance £39,019, and cash on deposit at bankers, value of gold in transit, and investments £215,203. The liabilities are: Sundry creditors, on account of dividends, stores, wages, Government tax, etc., £230,773, and balance of appropriation account £57,641. Working expenditure and revenue account received from gold won is £280,996, out of which total working expenditure absorbed £173,778, or 18s. 3d. per ton milled, which left a working profit of £107,218, or 11s. 3d. per ton milled. The interim appropriation account (subject to amendment) has a credit balance of working expenditure and revenue account for the three months ended the 31st of March, of £126,726, and for the three months ended the 30th of June £107,218, the total amount being £233,476. Against this sum is charged Government tax (estimated) for the six months £18,335, and dividend account for dividend No. 22, declared on the 18th of June £157,500, which leaves the balance of £57,641 carried to the balance sheet as stated above. The profits appropriated in the last quarterly report, amounting to £33,797, have been reversed. The credit balance of appropriation account is not wholly available for distribution as the amount of liability at the commencement of the financial year (£30.556), together with the capital expenditure for the six months ending 30th June, 1912 (£4,213), have not yet been appropriated. The amount to be appropriated for these sums will not be determined until the end of the financial year. On development work 3,138ft. have been driven, sunk and risen, exclusive of stopes. The reef disclosures were as follows: Main reef: Distance exposed, 964ft.; width, 40in.; assay value, 31s. 7d. Main reef leader: Distance exposed, 967ft.; width, 13in.; assay value, 77s. 11d. South reef: Distance exposed, 949ft.; width, 12in.; assay value, 46s. 1d. The tonnage crushed during the quarter was 190.500 tons, from which 66.897ozs. of gold were obtained, the total yield per ton being 29s. 6d. 116.478 tons of payable ore valued at 28s. 7d. per ton were added to the reserves during the quarter, in addition to which a further estimated tonnage of 115.500 tons has been exposed, but is not as yet fully developed and valued. Labour has been satisfactory, and has resulted in a tonnage crushed of 190,500 tons. The profit amounting to £107,218, shows an improvement of £6,000 on the preceding quarter. Capital expenditure for the quarter amounted to £972. An amount of £5,558 is required for the completion of authorised work.

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The Week's Company Meetings.

REX ZAAIPLAATS CENTRAL.

Progress of Development.

The statutory meeting of the Rex Zaaiplaats Central Tin, Ltd., was held this week in the office of the company. Bettelheim Buildings, Mr. H. Graumann presiding.

A statement as to the position of affairs was made by the chairman, who said : As you are aware, this is the statutory meeting of the Rex Zaaiplaats Central Tin, Ltd., and naturally, in so short a time after the inauguration of the company, there is not a great deal to say. It may be well, however, to take advantage of this meeting to give you some general idea of the exact situation and prospects of your company's ground—which comprises fifty-eight claims on the south-eastern corner of the farm Zaaiplaats, and immediately adjoining the claims known as Zaaiplaats Government Lease. The south-western portion of the claims are 450 feet, and the south-eastern portion some 700 feet north of the Zaaiplaats Tin Mining Company's property. They extend 3,117 feet from east to west and about 1,500 feet from north to south. Mr. H. Warren, who is supervising operations, and has had some considerable experience of the district, particularly with regard to tin, says that the farm Zaaiplaats is in what is known in the Transvaal as the red granite area, and the geology of this particular farm has been fully dealt with by the Transvaal Government's Geological Survey. The upper granite rocks are granophyre, below the granophyre is a pegmatite and below the pegmatite are altered granites and coarse red granite. In and below the pegmatite the altered granites and the coarse red granites are the different tin occurrences. Where the granophyre has been eroded, as on a portion of the Government Lease, the northern half of Zaaiplaats Tin Company's property and a portion of the fifty-eight claims, tin occurrences can be seen on the surface. Tin ore, however, is being worked in several places in the granites under the granophyre. Granophyre covers most of the surface of the fifty-eight claims, but on the southern portion are the tin-bearing altered and coarse red granites outcropping. On this area, which is a hill embracing the Zaaiplaats Tin Mining Company, Limited, the Government Lease ground and our claims, a characteristic is that where there are evidences of proper tin-bearing formation on the surface the ore bodies are not necessarily payable on the surface, but very often become so with depth. This has been demonstrated in many instances close to our property in the case of ore bodies, in which on the surface there was very little tin, but when they were sunk on tin began to show in small quantities, then became very good and often exceedingly rich.

Important Developments.

The two shafts east and west, where our work has been principally confined, are on parallel bodies to those on the Zaaiplaats Company's ground, and the shafts are located a few hundred feet north of that company's property. Upwards of 200 feet has been sunk on these. The results are very satisfactory, and particularly in the western shaft, where rich ore is more in evidence the greater the depth attained. The results from the workings and the data obtained are of great value, and especially in view of what was recently reported of the Government Lease ground, not far from the Rex property, where the lode was being opened up, carrying a large body of high-grade ore, and the stope faces looking remarkably well. It is stated that this is believed to be the only instance as yet in the occurrence of tin in the red granite in this country, where it has been possible actually to stope ore on an extensive scale. Everything points to similar results on our ground. All the ore bodies are located on the southern boundary, so we have the full advantage of plenty of dip ground. The rock is typical of the Zaaiplaats Company's ore, showing large and small cassiterite crystals with fluorspar sericite, and all the necessary secondary minerals associated with the ore bodies on that property. Practically everything of value on the adjoining properties is trending in our direction, and should be intersected at an easy depth, so that, independent of our own local occurrences, there are these additional features, the value and significance of which cannot be over-estimated." The latest report from the property, dated the 19th of August, says : "No. 2 west looking very well, showing plenty of coarse tin.

Metal Prices.

Messrs. H. R. Merton & Co., Ltd., write, under date August 2nd, as follows, *inter alia*:—The tin statistics for July, showing an increase in supplies of 482 tons, are considered very satisfactory for a month in which no less than 2,640 tons of Banca tin were added to the stocks. This quantity was sold by auction on Wednesday, fetching the unusually high price of £210 7s. 6d. (average), owing to keen competition amongst the buyers. Sentiment throughout the week was optimistic, and transactions were on a much larger scale, there being considerable orders for cash and forward delivery in our market, which raised prices very materially. We opened at £203 5s. for cash, £201 10s. three months, and steadily advanced until £205 10s. and £203 5s. was reached for the two positions. The advance brought out more tin from Eastern holders, who had been selling very sparingly for some time past and also led to some profit taking. This weakened the position somewhat, and encouraged the bear element to depress values, which in an unsupported market caused a sharp decline. We close at £202 10s. cash, £199 15s. three months. The total transactions during the week amounted to about 1,900 tons. English ingot tin, £206 10s. The latent strength in lead which we have noticed for some time past is now coming to the surface. Consumers who had been holding aloof during the labour troubles are now finding themselves bare of supplies and show some eagerness to make provision for the near future. This can only be done with difficulty, as sellers of early material are scarce and very full prices have to be paid for accommodation in August and even September. The forward position has also improved, and there are now very large enquiries in the market for delivery up to the end of this year. Prices are stronger, and we quote £18 12s. 6d. to £19 foreign, and £19 to £19 5s. for English. Spelter is featureless, with only small trade doing. Some enquiries for September and October delivery have not matured in business yet. America continues very strong, consumption is expanding, whilst production appears to have reached its maximum. We quote £25 12s. 6d. to £26 for ordinaries, and £26 5s. to £26 15s. for specials. The strength in iron and steel continues unabated. America sends glowing reports; consumption increases further, whilst production is greatly hampered by lack of labour. Since the commencement of the year Middlesbro' stocks have decreased 215,108 tons, and now stand at 287,121 tons. Our warrant market has been active, ruling strong throughout, prices advancing from the opening from 58s. 4½d. cash to 59s. 7d. We close 59s. 6d. cash, 59s. 9d. one month, 60s. 2d. three months. Aluminium, £76 to £78 per ton. Antimony £27 to £27 10s. nominal. Quicksilver, £8 5s. per bottle, first hands. Silver, 27⅝d. spot, and 27¾d. forward. Fine silver, 29 13-16d. spot, and 29 15-16d. forward.

INVESTORS' DIARY.

The following company meetings have been announced:—

Sept. 4.—New Kleinfontein; Anglo-French Land Co.
Sept. 21.—Wit. Deep.
Sept. 23.—Crown Mines.
Sept. 27.—Sub-Nigel; Simmer and Jack Prop.; New Kleinfontein; Wolhuter, G.M.
Oct. 19.—Wolhuter G.M.
Oct. 23.—Johannesburg Consolidated Investment Co.
Oct. 29.—Jumpers G.M. Co.
Oct. 30.—Rooiberg Minerals.
Nov. 6.—New Modderfontein.
Nov. 27.—New Boksburg G.M.; Rand Klip.

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Bucks Reef Progress.

The Bucks Reef Company earned a profit of £1,880 during the quarter ended with June last, a rather better result than generally was anticipated. The mill crushed 2,477 tons for a total recovery of 14·07 dwts. per ton, or £7,742. Working costs were at the rate of 47s. 4d. per ton, and capital expenditure for the quarter was £1,091. The development during the quarter totalled 564 feet. In the western section of the Bucks Reef the second and fourth levels have been connected by a raise from the intermediate drive, the distance risen being 106 feet, of which 91 feet are on reef averaging 12 inches in width, and assaying 58 dwts. per ton. In the winze below the eighth level, 65 feet have been sunk, exposing reef of value, 6 dwts. over 18 inches, for 48 feet. The reef cut out at 70 feet. *Prestwood Footage.*—Main shaft has been sunk to the fourth level, and cross-cut extended to the south drive from winze. The winze below fourth level was sunk 56 feet to 70 feet. As only stringers of reef were showing in this winze, it was decided to drive south; the reef here has widened, but no values have been met with. *Handcross Claims.*—On two blocks of claims recently pegged, adjoining the original Handcross block, prospect work is being done, and although good results have been obtained from near the surface, the reef has not continued to any depth. The payable ore reserves as at June 30, 1912, amounted to 3,603 tons. The consulting engineer has at present under consideration the question of temporarily closing down milling operations, which might be found necessary in order to push on development at depth.

The Miners and the Conciliation Board.

For the purpose of completing all the necessary arrangements in the procedure for the application of a Conciliation Board, members of the Transvaal Miners' Association met at the Grand Theatre last Saturday morning.

Mr. Ben Auret detailed the steps which it would be necessary to take from a legal point of view in order to secure a Conciliation Board. He said the Industrial Disputes Act was a law about which they were very much in the dark.

Mr. Tom Matthews urged that if no alteration were made, the agreement would mean a reduction in the men's wages.

The following resolution was read out by the Chairman:

That this mass meeting of the members of the Transvaal Miners' Association, having been duly specially summoned on at least three days' notice under sub-section (d) of section 4, clause 8 of chapter 3 of the Industrial Disputes Prevention Act, 1909, hereby authorise William Morgan, the President of the Transvaal Miners' Association, and Thomas Matthews, the general secretary of the Transvaal Miners' Association, to make the necessary application or applications for a Board or Boards of Conciliation and Investigation under the said Act No. 20 of 1909, and to take all necessary steps and do all necessary things in regard thereto in respect of the following companies to wit: Crown Mines Ltd.; Nourse Mines, Ltd.; Robinson Gold Mining Co., Ltd.; Ferreira Deep, Ltd.; Village Deep, Ltd.; City and Suburban Gold Mine and Estate Co., Ltd.; New Heriot Gold Mining Co., Ltd.; Simmer and Jack Proprietary Mines, Ltd.; Geldenhuis Deep, Ltd.; Aurora West Gold Mining Co., Ltd.; Lancaster West Gold Mining Co., Ltd.; West Rand Consolidated, Ltd.; Bantjes Consolidated Mines, Ltd.; Consolidated Main Reef Mines and Estate, Ltd.; Rose Deep, Ltd.; East Rand Proprietary Mines, Ltd.; City Deep, Ltd.; Meyer and Charlton G.M. Co., Ltd.; Wolhuter Gold Mines, Ltd.; Witwatersrand G.M. Co., Ltd.; Van Ryn G.M. Estate, Ltd.; New Kleinfontein Co., Ltd.; Durban Roodepoort Deep, Ltd.; Roodepoort United Main Reef G.M. Co., Ltd.; Princess Estate and Gold Mining Co., Ltd.

Another resolution was put forward authorising the officers of the association to take any further steps that might be necessary, even to the extent of organising a strike. This motion was also proposed and seconded from the body of the hall, and, in speaking to it, members announced that they had implicit confidence in their leaders and knew that every possible step would be taken to avoid extreme measures.

This resolution was carried, amid cheers.

The Deputy Inspector of Mines (Mr. J. H. Twiddy) has reported the result of an official inquiry made by him concerning a fatal accident which occurred at the City Deep Mine on August 12. In the affair, a white miner, P. A. du Plessis, and two natives were killed, and six natives injured—one of whom died on the following day. Evidence taken during the inquiry showed that a big sheet of footwall, averaging about 8 inches in thickness, had slipped. Witnesses stated that there had been no previous indications that the foot-wall was in any way unsound. After hearing the evidence Mr. Twiddy found that the accident was due to a slip of a sheet of stone in the footwall, and that the occurrence was entirely unforeseen.

Official Labour Statistics for July.

The following figures supplied by the Government Mines Department show the total number of persons in the service of companies and companies' contractors in the Transvaal and Union, but do not include a certain number of coloured convicts employed on the Witwatersrand area:—

GOLD MINES.

	White.	Coloured.
Witwatersrand	23,991	191,268
Heidelberg	237	2,698
Klerksdorp	94	955
Ottoshoop	6	78
Barberton	270	3,222
Pilgrim's Rest	304	4,681
Pietersburg	22	259
	24,924	203,161

The total for coloured labour on the Witwatersrand does not include 612 coloured convicts.

YEAR'S PROGRESS.

The following table of numbers actually in the employ of companies and companies' contractors shows the progress of labour for the whole Transvaal for the last thirteen months:—

	Gold Mines.		All Mines.	
	White.	Coloured.	White.	Coloured.
1911—				
July	25,780	201,485	27,668	229,071
August	25,632	198,332	27,521	225,105
September	25,431	196,421	27,332	224,084
October	25,329	196,019	27,214	223,171
November	25,157	195,073	27,033	221,113
December	25,114	194,336	26,978	218,811
1912.				
January	25,224	198,595	27,116	223,227
February	25,212	204,923	27,146	231,459
March	25,151	211,592	27,130	239,861
April	24,906	215,148	26,907	245,642
May	24,921	213,522	26,946	245,642
June	24,901	208,713	26,961	241,581
July	24,941	203,333	26,971	236,797

Grand total of the number in service of Transvaal mines, 263,768.

UNION TOTALS

	White.	Coloured.
Transvaal	26,971	236,796
Cape	2,924	18,802
Orange Free State	1,225	12,011
Natal	536	10,329
	31,656	277,939

The grand totals of the average numbers of persons actually in the employ of companies and companies' contractors in July on the gold, diamond, coal and metallurgical works, tailings syndicates, and alluvial works in the Transvaal and other Provinces are as follows:—

	Whites.	Coloured.	Total.
Witwatersrand	23,991	191,268	215,259
Other districts	933	11,893	12,826
Other Provinces	17	172	189
	24,941	203,333	228,274
Reef and Alluvial diggings	193	1,472	1,665
Metallurgical & tailings works	37	224	261
Total gold mines	25,171	205,029	230,200
Diamond mines	4,637	41,940	46,577
Coal mines	1,239	22,943	24,182
Base metals	534	6,911	7,445
Lime works and flint works	75	1,116	1,191
Grand totals	31,656	277,939	309,595

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for their safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

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